KENDRIYA VIDYALAYA SANGATHAN

REGIONAL OFFICE RAIPUR

STUDY MATERIAL AND SAMPLE PAPER

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For

Class - XII

SUBJECT CO-ORDINATION BY

Mrs. Sandhya Lakra,

Principal, KV No. 4 Korba

CONTENT TEAM

Mr. Yogesh, PGT CS, K V Kirandul
Mrs. Soma Seal Guha, PGT CS, K V CISF Bhilai

Mr. Ravi Kumar, PGT CS, K V Baikunthpur
Mrs. Pooja Gupta, PGT CS, K V Jhagrakhand
Mr. Nitin Sharma, PGT CS, K V Bacheli
Mr. Sandeep Kumar Shrivastav, PGT CS, K V Jashpur
Mr. Lokesh Singh, PGT CS, K V Mahasamund
Dr. Amarnath Pathak, PGT CS, K V Khairagarh
Mrs Shalini Singh, PGT CS, K V Chirmiri

COMPILATION, REVIEW & VETTING BY

Mr. Prakash Kumar Dewangan, PGT CS, KV No. 1 Shift II Raipur

KENDRIYA VIDYALAYA SANGATHAN, RO RAIPUR
STUDY MATERIAL
CLASS-XII, SUBJECT – COMPUTER SCIENCE (083)
UNIT-I (COMPUTATIONAL THINKING AND PROGRAMMING – 2)

CHAPTER 1: REVISION OF THE BASICS OF PYTHON

- **Python (a computer language) :**
  - Python is a powerful and high level language and it is an interpreted language.
  - It is widely used general purpose, high level programming language developed by Guido van Rossum in 1991.
  - Python has two basic modes: **interactive and script.**
  - In **interactive mode (python.exe/py.exe),** the result is returnedimmediately after pressing the enter key.
  - In **script mode (IDLE),** a file must be created and saved before executingthe code to get results.
- **Python's Features:**
  - Easy to use Object oriented language
  - Expressive language
  - Interpreted Language
  - Its completeness
  - Cross-platform Language
  - Fee and Open source
  - Variety of Usage / Applications

Basics of Python: Output

Simple Hello world Program print('hello world') print("HELLO WORLD")	**Output** hello world HELLO WORLD
Declaring/Defining variable x=30 y=20 z=x+y print(z) a,b=4,5 print(a,b)	**Output** 50 4 5
Output Formatting x,y=20,30 z=x+y print("The addition of x and y is ", z) print("The addition of ",x,"and ", y, "is ",z) print("The addition of %d and %d is %d" %(x,y,z))	**Output** The addition of x and y is 50 The addition of 20 and 30 is 50 The addition of 20 and 30 is 50
name="XYZ" age=26 salary=65748.9312 print("The age of %s is %d and salary is %.2f" %(name,age,salary))	**Output** The age of XYZ is 26 and salary is 65748.93

Basics of Python: Input

Accepting input without prompt X=10 print(X)	**Output** 10
Accepting input with prompt X=input(“Enter your name : ") print("My name is ",X)	**Output** Enter your name : Yogesh My name is Yogesh
Accepting formatted input (Integer, float, etc.) age=int(input("Enter your age : ")) height=float(input("Enter your height : ")) print("Your age is : ",age) print("Your height is : ",height)	**Output** Enter your age :16 Enter your height : 5.5 Your age is : 16 Your height is : 5.5

Tokens in Python

In a passage of text, individual words and punctuation marks are called tokens or lexical units or lexical elements. The smallest individual unit in a program is known as Tokens. Python has following tokens

- Keywords
- Identifiers(Name)
- Literals
- Operators
- Punctuators

Keywords in Python

There are 33 keywords in Python 3.7. This number can vary slightly in the course of time. All the keywords except True, False andNone are in lowercase and they must be written as it is. The list of all the keywords is given below.

and	del	from	not
while	as	elif	global
or	with	assert	else
if	pass	yield	break
except	import	print	class
exec	in	raise	continue
finally	is	return	def
for	lambda	try	

Operators in Python

Python language supports the following types of operators-

- Arithmetic Operators
- Relational Operators
- Assignment Operators
- Logical Operators
- Bitwise Operators
- Membership Operators
- Identity Operators

Operators in Python: Arithmetic

Assume a=10 and b=20

Operator	Description	Example
+ Addition	Adds values on either side of the operator.	a + b = 30
- Subtraction	Subtracts right hand operand from left hand operand.	a – b = -10
* Multiplication	Multiplies values on either side of the operator	a * b = 200
/ Division	Divides left hand operand by right hand operand	b / a = 2
% Modulus	Divides left hand operand by right hand operand and returns remainder	b % a = 0
** Exponent	Performs exponential (power) calculation on operators	a**b =10 to the power 20
//	Floor Division - The division of operands where the result is the quotient in which the digits after the decimal point are removed. But if one of the operands is negative, the result is floored, i.e., rounded away from zero (towards negative infinity) –	9//2 = 4 and 9.0//2.0 = 4.0, -11//3 = -4, -11.0//3 = -4.0

Operators in Python: Relational

Relational Operators are used to show relationship between two values or variables.

Following are the relational operators:

< (less than), >(greater than) , <= (less than equal to), >= (greater than equal too) ,!= (Not equal to) and = = (equality checkoperator)

Operators in Python: Logical

There are following logical operators supported by Python language. Assume variable a holds 10 and variable b holds 20 then –

Operator	Description	Example
and Logical AND	If both the operands are true then condition becomes true.	(a and b) is true.
or Logical OR	If any of the two operands are non-zero then condition becomes true.	(a or b) is true.
not Logical NOT	Used to reverse the logical state of its operand.	Not(a and b) is false.

Operators in Python: Assignment

Assume variable a holds 10 and variable b holds 20, then −

Operator	Description	Example
=	Assigns values from right side operands to left side operand	c = a + b assigns value of a + b into c
+= Add AND	It adds right operand to the left operand and assign the result to left operand	c += a is equivalent to c = c + a
-= Subtract AND	It subtracts right operand from the left operand and assign the result to left operand	c -= a is equivalent to c = c - a
*= Multiply AND	It multiplies right operand with the left operand and assign the result to left operand	c *= a is equivalent to c = c * a
/= Divide AND	It divides left operand with the right operand and assign the result to left operand	c /= a is equivalent to c = c / ac /= a is equivalent to c = c / a
%= Modulus AND	It takes modulus using two operands and assign the result to left operand	c %= a is equivalent to c = c % a
**= Exponent AND	Performs exponential (power) calculation on operators and assign value to the left operand	c **= a is equivalent to c = c ** a
//= Floor Division	It performs floor division on operators and assign value to the left operand	c //= a is equivalent to c = c // a

Operators in Python: Bitwise

Bitwise operator works on bit and performs bit by bit operation.
Assume if A=60 and B=13; now in binary they will be as follows
A(60)=00111100 B(13)=00001101

a&b = 0000 1100 (Use of bitwise Binary AND)
a|b = 0011 1101 (Use of bitwise Binary OR)
a^b = 0011 0001 (Use of bitwise XOR)
~a = 1100 0011 (Use of ones complement)

Operators in Python: Membership

Python's membership operators test for membership in a sequence, such as strings, lists, or tuples. There are two membership operators as explained below –

Operator	Description	Example
in	Evaluates to true if it finds a variable in the specified sequence and false otherwise.	x in y, here in results in a 1 if x is a member of sequence y.
not in	Evaluates to true if it does not finds a variable in the specified sequence and false otherwise.	x not in y, here not in results in a 1 if x is not a member of sequence y.

list=[1, 2, 3, 4, 5]
 	
print("Elements in the list: ",list)
if(3 in list):
 	
print(3, "available in the list")
else:
	Output
	
	Elements in the list: [1, 2, 3, 4, 5]
	3 available in the list

Operators in Python: Identity

Identity operators compare the memory locations of two objects. There are two Identity operators as explained below –

Operator	Description	Example
is	Evaluates to true if the variables on either side of the operator point to the same object and false otherwise.	x is y, here is results in 1 if id(x) equals id(y).
is not	Evaluates to false if the variables on either side of the operator point to the same object and true otherwise.	x is not y, here is not results in 1 if id(x) is not equal to id(y).

a,b = 20,20 print("ID of a :",id(a)," ID of b :",id(b)) if(a is b): print("a and b have same identity")else:	**Output** ID of a : 1442604432 ID of b : 1442604432 a and b have same identity

Control Statements in Python

Control statements are used to control the flow of execution depending upon the specified condition/logic.
There are three types of control statements-

1. Decision Making Statements (if, elif, else)
2. Iteration Statements (while and for Loops)
3. Jump Statements (break, continue, pass)

Decision Making Statements(if, elif, else)
Syntax:
if(logic):
Statement/s
elif(logic):
Statemet/s
else:
Statement/s
	Program
	a=int(input("Enter any integer number :"))
	if(a==0):
	print("Number is Zero")
	elif(a>0):
	print("Number is Positive")
	else:
	print("Number is negative")
		Output
		Enter any integer number :5
		Number is Positive

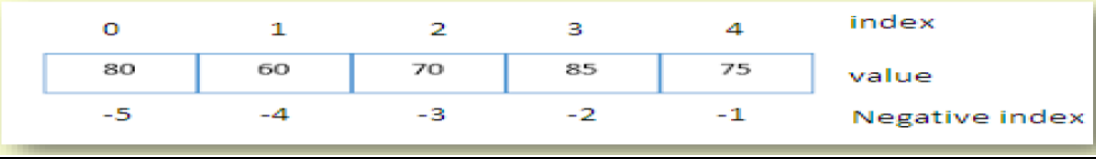
Iteration Statements (while loop) **Syntax:** while(condition): Statement/s	**Program:** n=1 while(n<4): print("Govind ", end=" ") n=n+1	**Output** Govind Govind Govind
Iteration Statements (for loop) **Syntax:** for value in sequence: Statements	**Program** for i in range(1,6): print(i, end=' ')	**Output** 1 2 3 4 5

Jump Statements (break, continue, pass)
Syntax:
for val in sequence:
if (val== i):
break
if (val== j):
continue
if (val== k):
pass
	Program
	for i in range(1,11):
	if(i==3):
	print("hello", end=' ')
	continue
	if(i==8):
	break
	if(i==5):
	pass
	else:
	print(i, end=' ');
		Output
		1 2 hello 4 6 7

List in Python

It is a collections of items and each item has its own index value.
Index of first item is 0 and the last item is n-1.Here n is number of items in a list.

Indexing of list



Creating a list and accessing its elements	Output

a=[10,20,'abc',30,3.14,40,50]
print(a)
for i in range(0,len(a)):
  print(a[i], end=' ')
print('\n')
for i in range(len(a)-1,-1,-1):
  print(a[i], end=' ')
print('\n')
for i in a[::-1]:
  print(i, end=' ')
print('\n')
for i in reversed(a):
  print(i, end=' ')
	[10, 20, 'abc', 30, 3.14, 40, 50]
	10 20 abc 30 3.14 40 50
	50 40 3.14 30 abc 20 10
	50 40 3.14 30 abc 20 10
	50 40 3.14 30 abc 20 10

Tuple in Python

It is a sequence of immutable objects. It is just like a list. Difference between a tuple and a list is that the tuple cannot bechanged like a list. List uses square bracket whereas tuple use parentheses.

L=[1,2,3,4,5] Mutable Elements of list can be changed

T=(1,2,3,4,5) Immutable Elements of tuple can not be changed

Creating a tuple and accessing its elements	Output

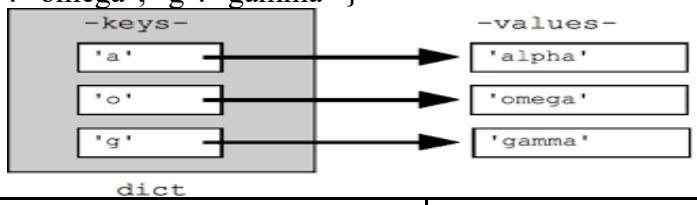
a=(10,20,'abc',30,3.14,40,50)
print(a)
for i in range(0,len(a)):
  print(a[i], end=' ')
print('\n')
for i in range(len(a)-1,-1,-1):
  print(a[i], end=' ')
print('\n')
for i in a[::-1]:
  print(i, end=' ')
print('\n')
for i in reversed(a):
  print(i, end=' ')
	(10, 20, 'abc', 30, 3.14, 40, 50)
	10 20 abc 30 3.14 40 50
	50 40 3.14 30 abc 20 10
	50 40 3.14 30 abc 20 10
	50 40 3.14 30 abc 20 10

Function	Description
tuple(seq)	Converts a list into a tuple.
min(tuple)	Returns item from the tuple with min value.
max(tuple)	Returns item from the tuple with max value.
len(tuple)	Gives the total length of the tuple.
cmp(tuple1,tuple2)	Compares elements of both the tuples.

Dictionary in Python

Dictionary in Python is an unordered collection of data values, used to store data values along with the keys. Dictionary holds key:value pair. Key value is provided in the dictionary to make it more optimized. Each key-value pair in a Dictionary is separated by a colon:, whereas each key is separated by a ‘comma’.

dict={ “a": “alpha", “o": “omega", “g": ”gamma” }



# Creating an empty Dictionary Dict = {} print("Empty Dictionary: ") print(Dict) **# Creating a Dictionary with Integer Keys** Dict = {1: ‘AAA', 2: ‘BBB', 3: ‘CCC'} print("\nDictionary with the use of Integer Keys: ") print(Dict) **# Creating a Dictionary with Mixed keys** Dict = {'Name': ‘Govind', 1: [10, 11, 12, 13]} print("\nDictionary with the use of Mixed Keys: ") print(Dict) **# Creating a Dictionary with dict() method** D=dict({1: 'AAA', 2: 'BBB', 3:'CCC'}) print("\nDictionary with the use of dict(): ") print(D) **# Creating a Dictionary with each item as a Pair** D=dict([(1, 'AAA'), (2, 'BBB')]) print("\nDictionary with each item as a pair: ") print(D)	**Output** Empty Dictionary: {} Dictionary with the use of Integer Keys: {1: ‘AAA', 2: ‘BBB', 3: ‘CCC'} Dictionary with the use of Mixed Keys: {'Name': 'Govind', 1: [10, 11, 12, 13]} Dictionary with the use of dict(): {1: 'AAA', 2: 'BBB', 3: 'CCC'} Dictionary with each item as a pair: {1: 'AAA', 2: 'BBB'}

# Creating an empty 	
DictionaryDict = {}
print("Empty Dictionary: ")print(Dict)
 	
# Adding elements one at a time 	
Dict[0] = ‘Govind'
Dict[2] = ‘Prasad'
Dict[3] = ‘Arya’
print("\nDictionary after adding 3 elements: ")
print(Dict)
 	
# Adding set of values# to a single Key 	
Dict['V'] = 1, 2
print("\nDictionary after adding 3 elements: ")
print(Dict)
 	
# Updating existing Key's Value 	
Dict[‘V’] = 3,4
print("\nUpdated dictionary: ")
print(Dict)
	Empty Dictionary:
	{}
	Dictionary after adding 3 elements:
	{0: 'Govind', 2: ‘Prasad', 3: ‘Arya’}
	Dictionary after adding 3 elements:
	{{0: 'Govind', 2: ‘Prasad', 3: ‘Arya’} , 'V': (1, 2,)}
	Updated dictionary:
	{{0: 'Govind', 2: ‘Prasad', 3: ‘Arya’} , 'V': (3, 4,)}

# Creating a Dictionary 	
D = {1: 'Prasad', 'name': 'Govind', 3: 'Arya'}
 	
# accessing a element using key 	
print("Accessing a element using key:")
print(D['name'])
 	
# accessing a element using key 	
print("Accessing a element using key:")
print(D[1])
 	
# accessing a element using get() method 	
print("Accessing a element using get:")
print(D.get(3))
	Output
	Accessing a element using key:Govind
	Accessing a element using key:Prasad
	Accessing a element using get:Arya

D={1:'AAA', 2:'BBB', 3:'CCC'}
print("\n all key names in the dictionary, one by one:")
for i in D:
print(i, end=' ')
print("\n all values in the dictionary, one by one:")
for i in D:
print(D[i], end=' ')
print("\n all keys in the dictionary using keys() method:")
for i in D.keys():
print(i, end=' ')
 	
print("\n all values in the dictionary using values() method:")
for i in D.values():
print(i, end=' ')
print("\n all keys and values in the dictionary using items() method:")
for k, v in D.items():
print(k, v, end=' ')
	Output
	all key names in the dictionary, one by one:
	1 2 3
	all values in the dictionary, one by one:
	AAA BBB CCC
	all keys in the dictionary using keys() method:
	1 2 3
	all values in the dictionary using values() method:
	AAA BBB CCC
	all keys and values in the dictionary using items()method:
	1 AAA 2 BBB 3 CCC

Very Short Answer Type Questions (1-Mark)

1. **Find the valid identifiers from the following : a. Myname b. My name c. True d. Myname_2**
   Ans: Myname and Myname_2 are valid identifiers
2. **What is None literal in Python?**
   Ans: Python has one special literal called "None". It is used to indicate something that has not yet been created. It is a legalempty value in Python.
3. **Can List be used as keys of a dictionary?**
   Ans: No, List can't be used as keys of dictionary because they are mutable. And a python dictionary can have keys of only immutable types.
4. **Find the invalid identifiers from the following**
   a) def b) For c) _bonus d) 2_Name
   Ans: def and 2_Name are invalid identifiers
5. **Find the output -**
   >>>A = [17, 24, 15, 30]
   >>>A.insert(2, 33)

>>>print (A [-4])
Ans: 24

6. **Name the Python Library modules which need to be imported to invoke the following functions:**
   (i) ceil() (ii) randrange()
   Ans: (i) math (ii) random
7. **Which of the following are valid operator in Python:**
   (i) */ (ii) is (iii) ^ (iv) like
   Ans: is and ^ are valid operators in python
8. **What will be the result of the following code?**
   >>>d1 = {"abc" : 5, "def" : 6, "ghi" : 7}
   >>>print (d1[0])
   (a) abc (b) 5 (c) {"abc":5} (d) KeyError
   Ans: KeyError
9. **Given the lists Lst=["C","O","M","P","U","T","E","R"] , write the output of:**
   print(Lst[3:6])
   Ans: ["P","U","T"]
10. **Which of the following is valid arithmetic operator in Python:**
    (i) // (ii)? (iii) < (iv) and
    Ans: //

Short Answer Type Questions (2-Marks)

1. **What are tokens in Python ? How many types of tokens are allowed in Python ? Examplify your answer.**
   Ans: The smallest individual unit in a program is known as a Token. Python has following tokens:
   1. Keywords — Examples are import, for, in, while, etc.
   2. Identifiers — Examples are MyFile, _DS, DATE_9_7_77, etc.
   3. Literals — Examples are "abc", 5, 28.5, etc.
   4. Operators — Examples are +, -, >, or, etc.
   5. Punctuators — ' " # () etc.
2. **Can nongraphic characters be used in Python ? How ? Give examples to support your answer.**
   Ans: Yes, nongraphic characters can be used in Python with the help of escape sequences. For example, backspace is represented as \b, tab is represented as \t, carriage return is represented as \r.
3. **Predict the output:**
   for i in range(1, 10, 3):
   print(i)
   Ans: 1
   4
   7
4. **Underline the Errors and rewrite the code after correcting errors: -**
   if N%2==0
   print(even)
   Else:
   print('odd")
   Ans:
   if N=>0:
   print("even")
   else:
   print("odd")

5. **What will be the output of the following snippet?**
   values =[ ]

```
for i in range (1,4):
        values.append(i)
print(values)
```
Ans: [1,2,3]

6. **Convert the following for loop in while loop**

```
for i in range(1,10,2):
        print(i)
```
Ans:
```
i=1
while(1<10):
        print(i)
        i+=2
```

7. **Predict the output of the following code snippet:**

```
a=10,20,30
b=list(a)
b[2]=[40,50]
print(a)
print(b)
```
Ans: (10,20,30)
[10,20,[40,50]]

8. **If given A=2,B=1,C=3, What will be the output of following expressions:**
   (i) print((A>B) and (B>C) or(C>A))
   (ii) print(AB**C)**
   Ans: (i) True (ii) 2

9. **What possible outputs(s) are expected to be displayed on screen at the time of execution of the program from the following code? Also specify the maximum values that can be assigned to each of the variables FROM and TO.**

```
import random
AR=[20,30,40,50,60,70]
FROM=random.randint(1,3)
TO=random.randint(2,4)
for K in range(FROM,TO):
    print (AR[K],end="#")
```
(i)10#40#70#(ii)30#40#50# (iii)50#60#70#(iv)40#50#70#
Ans: Maximum value of FROM = 3
Maximum value of TO = 4
(ii) 30#40#50#

10. **Rewrite the following Python program after removing all the syntactical errors (if any), underlining each correction:**

```
x = input("Enter a number")
if  x % 2 =0:
   print (x, "is even")
elseif  x<0:
   print (x, should be positive)
else;
   print (x, "is odd")
```
Ans:
```
x = input("Enter a number")    # int(input("Enter a number"))
if  x % 2 =0:
   print (x, "is even")
elseif  x<0:                          # elif
   print (x, should be positive)         # print (x, "should be positive")
```

```
else;                          # else:
   print (x, "is odd")
```

Application Based Questions (3 Marks)

1. **Predict the output of the following Code:**

```
for i in range(3):
    if i==2:
        continue
    print(i**2)
else:
    print("Bye")
```

Ans:

0
1
Bye

2. **Predict the output of the following Code:**

```
for i in range(1,11,3):
    if i==10:
        break
    print(i**2)
else:
    print("Bye")
```

Ans:

1
16
49

3. **Predict the output of the following Code:**

```
for i in range(-10,0):
    if i%3==0:
        print(i,end=' ')
        print(i**2)
```

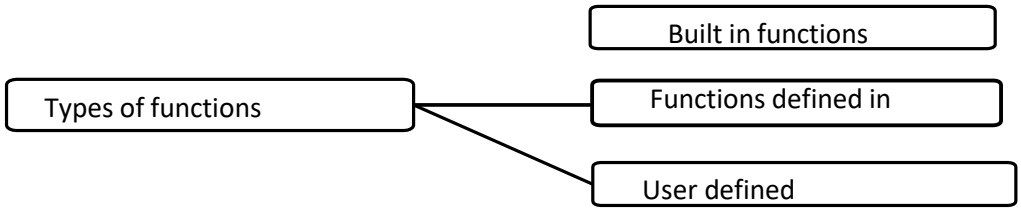
Ans:

-9 81
-6 36
-3 9

CHAPTER-2 FUNCTIONS IN PYTHON

Learning Outcomes: Understand the concept of functions in Python.
Definition: It is simply a group of statements under any name i.e. function name and can be invoked (call) from other part of program. Functions are the subprograms that perform specific task. Functions are the small modules.

Types of Functions:
There are **three** types of functions in python:



Library Functions: These functions are already built in the python library.
Functions defined in modules: These functions defined in particular modules. When you want to use these functions in program, you have to import the corresponding module of that function.
User Defined Functions: The functions those are defined by the user are called user defined functions.

Library Functions in Python:
These functions are already built in the library of python.For example: type( ), len( ), input( ) etc.

Functions defined in modules:

Functions of math module:
To work with the functions of math module, we must import math module in program.
import math

S. No.	Function	Description	Example
1	sqrt( )	Returns the square root of a number	>>>math.sqrt(49) 7.0
2	ceil( )	Returns the upper integer	>>>math.ceil(81.3) 82
3	floor( )	Returns the lower integer	>>>math.floor(81.3) 81
4	pow( )	Calculate the power of a number	>>>math.pow(2,3) 8.0
5	fabs( )	Returns the absolute value of a number	>>>math.fabs(-5.6) 5.6
6	exp( )	Returns the e raised to the power i.e. e^3	>>>math.exp(3) 20.085536923187668

Function in random module:
randint( )- function generates the random integer values including start and end values.Syntax: randint(start, end)- It has two parameters. Both parameters must have integer values.Example:
import random n=random.randint(3,7)
*The value of n will be 3 to 7.

User defined functions:

Syntax to create user defined function
def function_name([comma separated list of parameters]):
    statements….
    statements….

Key points to remember:

- Keyword def marks the start of function header
- Function name must be unique and follows naming rules same as for identifiers
- Function can take arguments. It is optional
- A colon(:) to mark the end of function header
- Function can contains one or more statement to perform specific task
- An optional return statement to return a value from the function.
- Function must be called/invoked to execute its code
- One or more valid python statements that make up the function body.
- Statements must have same indentation level

Example:

```
def display(name):
        print("Hello  " +   name   + "  How are you?")
```

User defined function can be:

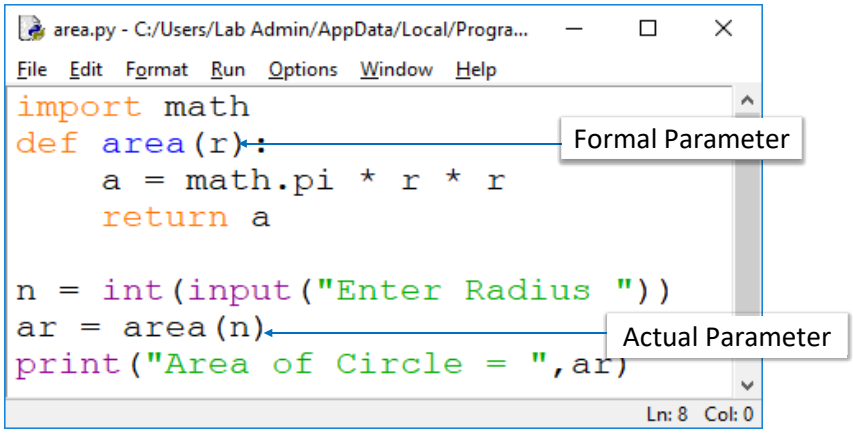
- Function with no arguments and no return
- Function with arguments but no return value
- Function with arguments and return value
- Function with no argument but return value

Function Parameters:

functions has two types of parameters:

Formal Parameter: Formal parameters are written in the function prototype and function header of the definition. Formal parametersare local variables which are assigned values from the arguments when the function is called.

Actual Parameter: When a function is *called*, the values that are passed in the call are called *actual parameters*. At the time of thecall each actual parameter is assigned to the corresponding formal parameter in the function definition.



Types of Arguments:

There are 4 types of Actual Arguments allowed in Python:

1. **Positional arguments:** are arguments passed to a function in correct positional order
2. **Default arguments:** we can provide default values for our positional arguments. In this case if we are not passing any value then default values will be considered.
3. **Keyword arguments:** allows to call function with arguments in any order using name of the arguments.
4. **Variable length arguments:** allow to call function with any number of arguments.

Calling the function:

Once we have defined a function, we can call it from another function, program or even the Python prompt. To call a function we simply type the function name with appropriate parameters.

Syntax:

Function_name(parameter)

Example:

ADD(10,20)

The return statement:

The **return** statement is used to exit a function and go back to the place from where it was called. There are two types of functions according to return statement:

a. Function returning some value
b. Function not returning any value

a. Function returning some value :

Syntax:

return expression/value

Example-1: Function returning one value

```
def my_function(x):
    return 5 * x
```

Example-2 Function returning multiple values:

```
def sum(a,b,c):
    return a+5, b+4, c+7
S=sum(2,3,4)                    # S will store the returned values as a tuple
print(S)
```

Output: (7, 7, 11)

Example-3: Storing the returned values separately:

```
def sum(a,b,c):
    return a+5, b+4, c+7
    s1, s2, s3=sum(2, 3, 4)     # storing the values separately
    print(s1, s2, s3)
```

Output:

7 7 11

b. Function not returning any value : The function that performs some operations but does not return any value, called void function.

```
def message():
    print("Hello")

m=message()
print(m)
```

Output: Hello
None

Scope and Lifetime of variables:

Scope of a variable is the portion of a program where the variable is recognized. Parameters and variables defined inside a function is not visible from outside. Hence, they have a local scope.

There are two types of scope for variables:

i) Local Scope
ii) Global Scope

Local Scope: Variable used inside the function. It cannot be accessed outside the function. In this scope, the lifetime of variables inside a function is as long as the function executes. They are destroyed once we return from the function. Hence, a function does not remember the value of a variable from its previous calls.

Global Scope: Variable can be accessed outside the function. In this scope, Lifetime of a variable is the period throughout which the variable exits in the memory.

Example 1:

```
def area(length, breadth):
    a = length * breadth     # 'a' is Local to function area
    return a

l = int(input("Enter Length "))
b = int(input("Enter Breadth "))
ar = area(l,b)
# Variable l, b, ar are or global scope
print("Area of Rectangle = ",ar)
```

Example 2:

```
def  func2():
                A = 2
                print("Value inside function:",A)
 A = 5
 func2()
print("Value outside function:",A)
```

OUTPUT:

Value inside function: 2
Value outside function: 5

Here, we can see that the value of **A** is **5** initially. Even though the function func2() changed the value of **A** to **2**, it did not affect the value outside the function.

This is because the variable **A** inside the function is different (local to the function) from the one outside. Although they have same names, they are two different variables with different scope.

On the other hand, variables outside of the function are visible from inside. They have a **global** scope.

We can read these values from inside the function but cannot change (write) them. In order to modify the value of variables outside the function, they must be declared as global variables using the keyword **global**.

Example:

```
def check():
    global value
    value=100
    print(value)

value=600
print(value)
check()
print(value)
```

Output:

```
600
100
100
```

Short Answer Type Questions (1-Mark)

1. **Name the built-in mathematical function / method that is used to return an absolute value of a number.**
   Ans: abs()
2. **Find and write the output of the following python code:**

```
def myfunc(a):
    a = a + 2
    a = a * 2
    return a
print(myfunc(2))
```

   Ans:8
3. **What is the default return value for a function that does not return any value explicitly?**
   Ans: None
4. **Name the keyword use to define function in Python.**
   Ans: def
5. **Predict the output of following code snippet:**

```
def function1(a):
    a=a+'1'
```

```
    a=a*2
function1('Hello')
```
Ans: Hello1Hello1

6. **Variable defined in function referred to _____variable.**
   Ans: local
7. **Name the argument type that can be skipped from a function call.**
   Ans: default arguments
8. **Positional arguments can be passed in any order in a function call. (True/False)**
   Ans: False
9. **Which of the following is function header statement is correct.**
   a. def fun(x=1,y) b. def fun(x=1,y,c=2) c. def fun(a,y=3)
   Ans: c. def fun(a,y=3)
10. **Predict the output of following code snippet.**

```
def printDouble(A):
    print(2*A)
print(3)
```
Ans: 3

Short Answer Type Questions (2-Marks)

1. What is the difference between a Local Scope and Global Scope ? Also, give a suitable Python code to illustrate both.

   Ans: A name declared in top level segment (main) of a program is said to have global scope and can be used in entire program.
   A name declare in a function body is said to have local scope i.e. it can be used only within this function and the oth block inside the function.

```
Global=5
def printDouble(A):
    Local=10
    print(Local)
print(Global)
```

2. **Define different types of formal arguments in Python, with example.**
   Ans: Python supports three types of formal arguments :
   1) Positional arguments (Required arguments) - When the function call statement must match the number and order arguments as defined in the function definition. Eg. def check (x, y, z) :
   2) Default arguments – A parameter having default value in the function header is known as default parameter. Eg. def interest(P, T, R=0.10) :
   3) Keyword (or named) arguments- The named arguments with assigned value being passed in the function call statement. Eg. interest (P=1000, R=10.0, T = 5)

3. **Observe the following Python code very carefully and rewrite it after removing all syntactical errors with each correction underlined.**

```
DEF result_even( ):
x = input("Enter a number")
    if (x % 2 = 0) :
        print ("You entered an even number")
    else:
        print("Number is odd")

even ( )
```

Ans:

```
def result_even( ):
    x = int(input("Enter a number"))
    if (x % 2 == 0) :
        print ("You entered an even number")
    else:
        print("Number is odd")

result_even( )
```

4. **Differentiate between Positional Argument and Default Argument of function in python with suitable example**

Ans: Positional Arguments: Arguments that are required to be passed to the function according to their position in the function header. If the sequence is changed, the result will be changes and if number of arguments are mismatched, error message will be shown.

Example:

```
def divi(a, b):
    print (a / b)
>>> divi(10, 2)
5.0
>>> divi (10)
Error
```

Default Argument: An argument that is assigned a value in the function header itself during the function definition. When such function is called without such argument, this assigned value is used as default value and function does its processing with this value.

```
def divi(a, b = 1):
    print (a / b)
>>> divi(10, 2)
>>> 5.0
```

5. **Ravi a python programmer is working on a project, for some requirement, he has to define a function with name CalculateInterest(), he defined it as:**

```
def CalculateInterest (Principal, Rate=.06,Time): # code
```

But this code is not working, Can you help Ravi to identify the error in the above function and what is the solution.

Ans: In the function CalculateInterest (Principal, Rate=.06,Time) parameters should be default parameters from right to left hence either Time should be provided with some default value or default value of Rate should be removed.

6. **Predict the output of the following python code:**

```
def guess(s):
n = len(s)
m=""
for i in range(0, n):
        if (s[i] >= 'a' and s[i] <= 'm'):
                m = m +s[i].upper()
        elif (s[i] >= 'n' and s[i] <= 'z'):
                m = m +s[i-1]
        elif (s[i].isupper()):
                m = m + s[i].lower()
        else:
                m = m +'#'
print(m)
guess("welcome2kv")
```

Ans: vELCcME#Kk

7. **What is the meaning of return value of a function? Give an example to illustrate its meaning.**

Ans: Return value of a function is the value which is being given back to the main program after the execution of function.

e.g.

```
def Check():
    return 100
```

8. **Differentiate between call by value and call by reference with a suitable example for each.**

Ans: In the event that you pass arguments like whole numbers, strings or tuples to a function, the passing is like call-value because you can not change the value of the immutable objects being passed to the function. Whereas passing mutable objects can be considered as call by reference because when their values are changed inside the function, the will also be reflected outside the function.

9. **Find and write the output of the following Python code:**

```
def Show(str):
    m=""
    for i in range(0,len(str)):
        if(str[i].isupper()):
            m=m+str[i].lower()
        elif str[i].islower():
            m=m+str[i].upper()
        else:
            if i%2==0:
                m=m+str[i-1]
            else:
                m=m+"#"
    print(m)
Show('HappyBirthday')
```

Ans: hAPPYbIRTHDAY

10. **Rewrite the following code in python after removing all syntax errors. Underline each correction done in the code:**

```
Def func(a):
        for i in (0,a):
            if i%2 =0:
                s=s+1
            elseif i%5= =0
                m=m+2
            else:
                n=n+i
                print(s,m,n)
func(15)
```

Ans:

```
def func(a):                #def
    s=m=n=0                 #local variable
    for i in range(0,a):    #range function missing
        if i%2==0:
            s=s+i
        elif i%5==0:        #elif and colon
            m=m+i
        else:
            n=n+i
    print(s,m,n)            #indentation
func(15)
```

Application Based Questions (3 Marks)

1. **Write a function listchange(Arr)in Python, which accepts a list Arr of numbers , the function will replace the even number by value 10 and multiply odd number by 5 .**

   Sample Input Data of the list is:

   a=[10,20,23,45]
   listchange(a,4)
   output : [10, 10, 115, 225]

   Ans:

```
def listchange(arr,n):
    l=len(arr)
    for a in range(l):
      if(arr[a]%2==0):
         arr[a]=10
      else:
         arr[a]=arr[a]*5

a=[10,20,23,45]
listchange(a)
print(a)
```

2. **Write a function LShift(Arr,n) in Python, which accepts a list Arr of numbers and n is a numeric value by which all elements of the list are shifted to left.**

   Sample Input Data of the list

   Arr= [10,20,30,40,12,11], n=2
   Output
   Arr = [30,40,12,11,10,20]

   Ans:

```
def LShift(Arr,n):
   L=Arr[n::]
   R=Arr[:n:]
   Arr=L+R
   print(Arr)
```

3. **Write a function REP which accepts a list of integers and size of list and replaces elements having even values with its half and elements having odd values with twice its value. eg: if the list contains**

   3, 4, 5, 16, 9
   then the function should rearranged list as
   6, 2,10,8, 18
   Ans:

```
def REP (L, n):
   for i in range(n):
    if L[i] % 2 == 0:
          L[i] /= 2
    else:
          L[i] *= 2
   print (L)
```

4. **Write a function which accept the two lists, and returns a list having only those elements that are common between both the lists (without duplicates) in ascending order.**

   Make sure your program works on two lists of different sizes. e.g.

   L1= [1,1,2,3,5,8,13,21,34,55,89]
   L2= [20,1,2,3,4,5,6,7,8,9,10,11,12,13]

The output should be:
[1,2,3,5,8,13]
Ans: L1= [1,1,2,3,5,8,13,21,34,55,89]
L2= [20,1,2,3,4,5,6,7,8,9,10,11,12,13]
L3=[]

```
temp_L1=list(set(L1))
temp_L2=list(set(L2))
for i in temp_L1:
    for j in temp_L2:
        if i==j:
            L3.append(i)
L3.sort()
print(L3)
```

5. **Write a user defined function countwords() to accept a sentence from console and display the total number of words present in that sentence.**
   For example if the sentence entered by user is:
   "Living a life you can be proud of doing your best." then the countwords() function should display the output as:
   Total number of words : 11
   Ans:

```
def countwords():
   sen = input("Enter a line : ")
   z = sen.split ()
   print ("Total number of words:", len(z))
```

INTRODUCTION TO FILES

A file is an essential data item stored in one's computer. Each file can be characterized with its filename & file extension.

TYPES OF FILES

Computers store every file as a collection of 0s and 1s i.e., in binary form. Therefore, every file is basically just a series of bytes stored one after the other. There are mainly two types of data files — text file and binary file.

Text file

A text file consists of human readable characters, which can be opened by any text editor and can be understood as a sequence of characters consisting of alphabets, numbers and other special symbols. Files with extensions like .txt, .py, .csv, etc. are some examples of text files. Each line of a text file is terminated by a special character, called the End of Line (EOL). The default EOL character in Python is the newline (\n).

CSV files

A CSV (comma-separated values) file is a text file that has a specific format which allows data to be saved in a table structured format. CSV file is a delimited text file that uses a comma to separate values. Each line of the file is a data record.

Binary File

Binary files are also stored in terms of bytes (0s and 1s), but unlike text files, these bytes do not represent the ASCII values of characters. Rather, they represent the actual content such as image, audio, video, compressed versions of other files, executable files, etc. These files are not human readable. hence require specific programs to access its contents.

ABSOLUTE AND RELATIVE PATH

A path is a unique location to a file or a folder in a file system of an OS. A path to a file is a combination of / and alpha-numeric characters.

Absolute Path-name

An absolute path is defined as the specifying the location of a file or directory from the root directory(/).To write an absolute path-name:

- Start at the root directory (/) and work down.
- Write a slash (/) after every directory name (last one is optional)

An absolute path is a complete path from start of actual file system from / directory.

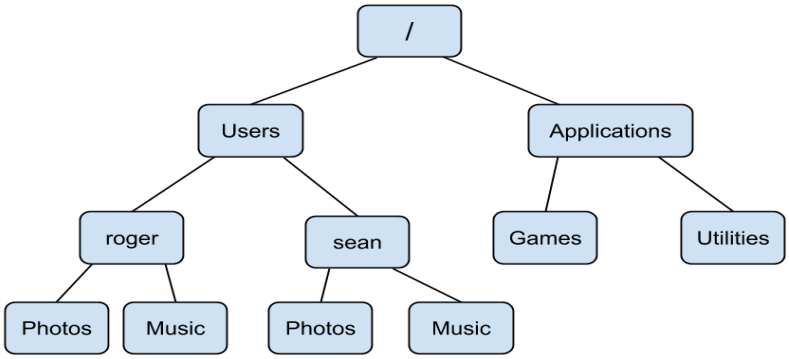
Relative path

Relative path is defined as the path related to the present working directly(pwd). It starts at your current directory and never starts with a /.

.(a single dot) - this represents the current directory.

..(two dots) - this represents the parent directory.

Example –



If we are presently in Directory **roger**, and want to change the directory to **sean**, then command for –
Absolute path is – **cd /Users/sean**
Relative path is – **cd ../../sean**

TEXT FILE

1. **Opening a text file -** It is done using the open() function.
File_object = open(r"File_Name","Access_Mode")

The file should exist in the same directory as the python program file else, the full address of the file should be written in place of the filename.

2. **Text File open modes** –

Modes	Description
r	Open text file for reading. The handle is positioned at the beginning of the file. If the file does not exists, raises the I/O error. This is also the default mode in which a file is opened.
r+	Open the file for reading and writing. The handle is positioned at the beginning of the file. Raises I/O error if the file does not exist.
w	Open the file for writing. For the existing files, the data is truncated and over-written. The handle is positioned at the beginning of the file. Creates the file if the file does not exist.
w+	Open the file for reading and writing. For an existing file, data is truncated and over-written. The handle is positioned at the beginning of the file.
a	Open the file for writing. The file is created if it does not exist. The handle is positioned at the end of the file. The data being written will be inserted at the end, after the existing data.
a+	Open the file for reading and writing. The file is created if it does not exist. The handle is positioned at the end of the file. The data being written will be inserted at the end, after the existing data.

3. **Closing a text file –** This is done by using close( ) function.
File_object**.**close( )

4. **Opening a file using with clause** – the syntax is -
   with open(file_path, mode) as file:
   Here - **file_path** is the path to the file to open, and
   Mode is the mode of operation on the file. Eg. read, write etc.

5. **Writing data to a text file –**
   For writing data into a file, the file must be opened in write mode. There are 2 methods for writing data into a file –
   a) **write(string)** : It writes the given string to the file and return the number of characters written. **Syntax –** file_object.write(string)
   b) **writelines(list) :** Using this function we can give list of lines to write into the file. **Syntax –** file_object.writelines(list)

6. **Appending data to a text file** –
   If we want to add new contents to an already existing file, then the file must be opened in append mode. Both the functions write() and writelines() can be used to add contents to the file.

7. **Reading from a text file –**
   For reading the contents of a file, it must be opened in read mode. There are three ways to read data from a text file –
   a) **read()** : Returns the read bytes in form of a string. Reads n bytes, if no n specified, reads the entire file**. Syntax** – File_object.read([n])
   b) **readline()** : Reads a line of the file and returns in form of a string. For specified n, reads at most n bytes. However, does not reads more than one line, even if n exceeds the length of the line. **Syntax –** File_object.readline([n])
   c) **readlines()** : Reads all the lines and return them as each line a string element in a list. **Syntax –** File_object.readlines()

8. **Seek and tell methods –**
   The tell() method tells you the current position within the file; in other words, the next read or write will occur at that many bytes from the beginning of the file.

   The seek(offset[, from]) method changes the current file position. The offset argument indicates the number of bytes to be moved. The from argument specifies the reference position from where the bytes are to be moved.

   If from is set to 0, it means use the beginning of the file as the reference position and 1 means use the current position as the reference position and if it is set to 2 then the end of the file would be taken as the reference position.

EXAMPLE - Program to show various ways to read and write data in a file.

```
file1 = open("myfile.txt","w")
L = ["This is Delhi \n","This is Paris \n","This is London \n"]

# \n is placed to indicate EOL (End of Line)
file1.write("Hello \n")
file1.writelines(L)
file1.close() #to change file access modes
```

```
file1 = open("myfile.txt","r+")
print("Output of Read function is ")
print(file1.read())
print()

# seek(n) takes the file handle to the nth bite from the beginning.
file1.seek(0)
print( "Output of Readline function is ")
print(file1.readline())
print()
file1.seek(0)

# To show difference between read and readline
print("Output of Read(9) function is ")
print(file1.read(9))
print()

file1.seek(0)
print("Output of Readline(9) function is ")
print(file1.readline(9))
file1.seek(0)
# readlines function
print("Output of Readlines function is ")
print(file1.readlines())
print()
file1.close()
```

Output:

```
Output of Read function is
Hello
This is Delhi
This is Paris
This is London

Output of Readline function is
Hello

Output of Read(9) function is
Hello
Th

Output of Readline(9) function is
Hello

Output of Readlines function is
['Hello \n', 'This is Delhi \n', 'This is Paris \n', 'This is London \n']
```

9. Manipulation of data in a text file –

1 – Write a Python program to read a file line by line and store it into an array/list.

```
content_list = []
with open("file.txt") as f:
    for line in f:
```

```
            content_list.append(line)
        print(content_list)
```

2 – Write a Python program to count the number of lines in a text file.

```
with open(r"myfile.txt", 'r') as fp:
    lines = len(fp.readlines())
    print('Total Number of lines:', lines)
```

3 – Write a Python program to count the frequency of words in a file.

```
# Open the file in read mode
text = open("sample.txt", "r")

# Create an empty dictionary
d = dict()

# Loop through each line of the file
for line in text:
    # Remove the leading spaces and newline character
    line = line.strip()

    # Convert the characters in line to lowercase to avoid case mismatch
    line = line.lower()

    # Split the line into words
    words = line.split()

    # Iterate over each word in line
    for word in words:
        # Check if the word is already in dictionary
        if word in d:
            # Increment count of word by 1
            d[word] = d[word] + 1
        else:
            # Add the word to dictionary with count 1
            d[word] = 1

# Print the contents of dictionary
for key in list(d.keys()):
    print(key, ":", d[key])
```

4 – Write a Python program to copy the contents of a file to another file.

```
# open both files
with open('first.txt','r') as firstfile, open('second.txt','a') as secondfile:
    # read content from first file
    for line in firstfile:
            # append content to second file
            secondfile.write(line)
```

5 – Write a Python program that takes a text file as input and returns the number of words of a given text file

```
number_of_words = 0
with open(r'SampleFile.txt','r') as file:
```

```
    data = file.read()
    # Splitting the data into separate lines using the split() function
    lines = data.split()

    # Adding the length of the lines in our number_of_words variable
    number_of_words += len(lines)

# Printing total number of words
print(number_of_words)
```

BINARY FILE

1. Basic operations on a binary file –

a) Open using file open modes – The open() function opens a file in text format by default. To open a file in binary format, add 'b' to the mode parameter.

Binary file modes –

Modes	Description
rb	Open text file for reading in binary format. The handle is positioned at the beginning of the file. If the file does not exists, raises the I/O error. This is also the default mode in which a file is opened.
rb+	Open the file for reading and writing. The handle is positioned at the beginning of the file. Raises I/O error if the file does not exist.
wb	Open the file for writing. For the existing files, the data is truncated and over-written. The handle is positioned at the beginning of the file. Creates the file if the file does not exist.
wb+	Open the file for reading and writing. For an existing file, data is truncated and over-written. The handle is positioned at the beginning of the file.
ab	Open the file for writing. The file is created if it does not exist. The handle is positioned at the end of the file. The data being written will be inserted at the end, after the existing data.
ab+	Open the file for reading and writing. The file is created if it does not exist. The handle is positioned at the end of the file. The data being written will be inserted at the end, after the existing data.

b) Close a binary file – The close() method of a file object flushes any unwritten information and closes the file object, after which no more writing can be done. Python automatically closes a file when the reference object of a file is reassigned to another file. It is a good practice to use the close() method to close a file.
Syntax – fileObject.close()

c) Import pickle module – Python pickle module is used for serializing and de-serializing a Python object structure. Any object in Python can be pickled so that it can be saved on disk. What pickle does is that it "serializes" the object first before writing it to file. **Pickling** is a way to convert a python object (list,

dict, etc.) into a character stream. The idea is that this character stream contains all the information necessary to reconstruct the object in another python script. **Unpickling** is a process by which original Python objects are retrieved from the stored string representation i.e., from the pickle file. It converts the byte stream into a Python object.

d) Dump and load method – We use dump() method to perform pickling operation on our Binary Files. It returns the object representation in byte mode. The dump() method belongs to pickle module. The reverse conversion of byte stream back to the structure (lists, dictionary, tuples etc.) refers to unpickling. Basically it is the reverse operation of pickling. This is also called de-serialization. We use load() method for unpickling.

e) Read, write/create a binary file – Use "rb" mode to open a binary file for reading contents and "wb" mode for writing contents to a binary file.

For example – Writing in a binary file and then reading the contents and displaying it.

```
import pickle
file = open("binary.dat",'wb')
x = [1,2,3,4,5]    #data we wrote in file
pickle.dump(x,file)
file.close()

file = open("binary.dat",'rb')
data = pickle.load(file)
file.close()
print(data)
```

f) Searching in a binary file – Searching in binary files involves reading of the binary file and then comparing each record with our given value using linear search method.

For example – A program to search a particular record from a binary file.

```
import pickle
f = open("Sports.dat","rb")
pc = int(input("Player to code to search:"))
tf = 0
while True:
      data= pickle.load(f)
      for record in data:
         if record[0]==pc:
            print("Player Name:",record[1])
            print("Individual Score:",record[2])
            print("Rank:",record[3])
            tf = 1
            break
f.close()
if tf==0:
   print("Record not found...")
else:
   print("Record Found....")
```

g) Appending in a binary file – To append data to a binary file, open the file in "ab" mode. A file opened in append mode will retain the previous records and append the new records at the end of the file.

For example – A program to add a new record to binary file sports.dat

```
f = open("sports.dat","ab")
data_log = []
print("Append Data")
pcode = int(input("Enter the Player code:"))
pname = input("Enter Player Name:")
score = int(input("Enter individual score:"))
rank = int(input("Enter Player Rank:"))
data_log.append([pcode,pname,score,rank])
pickle.dump(data_log,f)
f.close()
```

h) Updating a record in a binary file – In order to update a binary file, first the record to be updated must be searched and the position of file pointer must be known. To check out the position of the file pointer, we use two file pointer location functions – tell() and seek()

For example – A program to update record of a player in the binary file sports.dat

```
import pickle
import os      # for remove() and rename()
f = open("Sports.dat","rb")
f1=open("temp.dat","wb")
pc = int(input("Player to code to update records:"))
f.seek(0)
while True:
     current_pos = f.tell()
     data= pickle.load(f)
     for record in data:
          if record[0]==pc:
               record[1]=input("Enter Player Name to update:")
               record[2]=input("Enter Individual Score to update:")
               record[3]= input("Enter score to update:")
               f.seek(current_pos)
               pickle.dump(data,f1)
               break
 f.close()
 os.remove("Sports.dat")            # deletes the file passed
 os.rename("temp.dat","Sports.dat")    #renames first file name, with second filevname
```

CSV (COMMA SEPARATED VALUE) FILES

1. **Import csv module –** While we could use the built-in open() function to work with CSV files in Python, there is a dedicated csv module that makes working with CSV files much easier.

2. **Basic operations on csv files –**

a) **Open/ close csv file –** The csv file is opened as a text filewith Python's built-in function open(). Closing a csv file is same as closing a text/binary file using function close().

b) **Write into a csv file using csv.writer(), writerow() and writerows() –** The csv.writer() function returns a writer object that converts the user's data into a delimited string. csv.writer class provides two methods for writing to CSV. They are –

writerow(): This method writes a single row at a time. Field row can be written using this method.
writerows(): This method is used to write multiple rows at a time. This can be used to write rows list.

For example –

```
import csv
# field names
fields = ['Name', 'Branch', 'Year', 'CGPA']

# data rows of csv file
rows = [ ['Nikhil', 'COE', '2', '9.0'], ['Sanchit', 'COE', '2', '9.1'], ['Aditya', 'IT', '2', '9.3'],
        ['Sagar', 'SE', '1', '9.5'], ['Prateek', 'MCE', '3', '7.8'], ['Sahil', 'EP', '2', '9.1']]

# writing to csv file
with open("university_records.csv", 'w') as csvfile:
    # creating a csv writer object
    csvwriter = csv.writer(csvfile)

    # writing the fields
    csvwriter.writerow(fields)

    # writing the data rows
    csvwriter.writerows(rows)
```

c) **Reading from a csv file using csv.reader() -** At first, the CSV file is opened using the open() method in 'r' mode(specifies read mode while opening a file) which returns the file object then it is read by using the reader() method of CSV module that returns the reader object that iterates throughout the lines in the specified CSV document.

For example –

```
import csv
# opening the CSV file

with open('emp.csv', 'r') as file:
  # reading the CSV file
  csvFile = csv.reader(file)

  # displaying the contents of the CSV file
  for lines in csvFile:
        print(lines)
```

MULTIPLE CHOICE QUESTIONS

1. Select the correct output of the following code - fp.seek(5, 1)
a) Move file pointer five characters ahead from the current position.
b) Move file pointer five characters ahead from the beginning of a file.
c) Move file pointer five characters behind from the current position.
d) Move file pointer five characters behind ahead from the end of a file.

2. If the file is opened in write mode and already exists, it truncates the existing content and places the filehandle at the beginning of the file.
a) True
b) False

3. Which method is used to read a text file line by line
a) read(1)
b) readlines(1)
c) readline()
d) line()

4. Select the correct method to write a list of lines to a file
a) write(list)
b) writelines(list)
c) writelist(list)
d) None of these

5. Select the incorrect file access mode
a) r
b) ab+
c) rw+
d) wb+

6. Which method is used to sets the position of a file pointer
a) ftell()
b) fseek()
c) tell()
d) seek()

7. Select the correct mode to open a file for appending as well as reading
a) a+
b) ar
c) rw
d) ar+

8. Select true statement when a file is opened using the with statement
a) The with statement makes exception handling complex
b) The file is automatically closed after leaving the block, and all the resources that are tied up with the file are released.
c) File reading and writing are faster using the with statement.
d) None of these

9. Processing of a text file is faster than binary files
a) True
b) False

10. Which mode creates new file if the file does not exist?
a) Write
b) Append
c) Both a and b
d) None of the above

11. readlines() method returns
a) String
b) List
c) Dictionary
d) Tuple

12. Which function is used to read data from a binary file?
a) read()
b) readlines()
c) dump()
d) load()

13. If the file pointer is at the end of 5th line in the file "Summary.txt", then which of the following options can be used to read the remaining lines?
a) f.read()
b) f.readlines()
c) f.read(all)
d) f.readline()

14. _____ module is used for serializing and de-serializing any Python object structure
a) csv
b) math
c) pickle
d) pandas

15. _____ function returns string
a) read()
b) readline()
c) Both a and b
d) None of the above

16. Which of the following function takes 2 arguments?
a) load()
b) dump()
c) Both a and b
d) None of the above

17. Almost all the files in our computer is stored as _____ file
a) Text
b) Binary

c) CSV
d) None

18. There is no delimiter to end a line in binary files.
a) True
b) False

19. _____ function returns the current position of the file pointer.
a) seek()
b) tell()
c) cur()
d) get()

20. Which statement will move file pointer 10 bytes backward from the current position?
a) f.seek(-10,0)
b) f.seek(10,1)
c) f.seek(-10,1)
d) f.seek(-10,2)

Answer Key –

1	(a)	**5**	(c)	**9**	(b)	**13**	(b)	**17**	(b)
2	(a)	**6**	(d)	**10**	(c)	**14**	(c)	**18**	(a)
3	(c)	**7**	(a)	**11**	(b)	**15**	(c)	**19**	(b)
4	(b)	**8**	(b)	**12**	(d)	**16**	(b)	**20**	(c)

CASE-BASED/ SOURCE-BASED INTEGRATED QUESTIONS

1. **Madhur, a student of class 12th, is learning CSV File Module in Python. During examination, he has been assigned an incomplete python code (shown below) to create a CSV File 'Student.csv' (content shown below). Help him in completing the code which creates the desired CSV File.**

CSV File – student.csv
1,AKSHAY,XII,A
2,ABHISHEK,XII,A
3,ARVIND,XII,A
4,RAVI,XII,A
5,ASHISH,XII,A

Incomplete Code

```
import_____ #Statement-1
fh = open(_____, _____, newline='') #Statement-2
stuwriter = csv._____ #Statement-3
data = []
header = ['ROLL_NO', 'NAME', 'CLASS', 'SECTION']
data.append(header)
for i in range(5):
    roll_no = int(input("Enter Roll Number : "))
    name = input("Enter Name : ")
    Class = input("Enter Class : ")
    section = input("Enter Section : ")
```

```
    rec = [_____] #Statement-4
    data.append(rec)
stuwriter. _____ (data) #Statement-5
fh.close()
```

(i) Identify the suitable code for blank space in line marked as Statement-1.
a) csv file
b) CSV
c) csv
d) Csv
Correct Answer : c) csv

(ii) Identify the missing code for blank space in line marked as Statement-2?
a) "School.csv","w"
b) "Student.csv","w"
c) "Student.csv","r"
d) "School.csv","r"
Correct Answer : b) "Student.csv","w"

(iii) Choose the function name (with argument) that should be used in the blank space of line marked as Statement-3
a) reader(fh)
b) reader(MyFile)
c) writer(fh)
d) writer(MyFile)
Correct Answer : c) writer(fh)

(iv) Identify the suitable code for blank space in line marked as Statement-4.
a) 'ROLL_NO', 'NAME', 'CLASS', 'SECTION'
b) ROLL_NO, NAME, CLASS, SECTION
c) 'roll_no','name','Class','section'
d) roll_no,name,Class,sectionc) co.connect()
Correct Answer : d) roll_no,name,Class,section

(v) Choose the function name that should be used in the blank space of line marked as Statement-5 to create the desired CSV File?
a) dump()
b) load()
c) writerows()
d) writerow()
Correct Answer : c) writerows()

2. **Amaira's teacher asked her to count the no. of times words 'he' and 'she' comes in a text file "poem.txt". She wrote the code, but got confused in few statements. Help her complete the following code.**

```
f=open("poem.txt", "___") #Statement-1
data=f._____              #Statement-2
data=data._________       #Statement-3
c=0
c1=0
for ch in data:
```

```
    ch=ch._______        #Statement-4
    if ch=="HE" :
          c=c+1
    elif ch=="SHE":
          c1+=1
print("No of She",c1)
print("No of he",c)
f._______                    #Statement-5
```

(i) Which of the following modes to be used in Statement-1while opening the file?

a) w
b) r
c) a
d) w+

Answer – (b) r

(ii) What should come in statement-2 to read all the contents of the file as a single string?

a) read()
b) readline()
c) readlines()
d) load()

Answer – (a) read()

(iii) Which function should come in Statement-3 to get a list of words?

a) getlist()
b) splitstr()
c) split()
d) getword()

Answer – (c) split()

(iv) Which function should be used in Statement-4 to convert the string in uppercase?

a) toupper()
b) ToUpper()
c) uppercase()
d) upper()

Answer – (d) upper()

(v)What should be written in Statement-5 to close the file?

a) close('poem.txt')
b) close()
c) end()
d) close(f)

Answer – (b) close()

3. Amit Kumar of class 12 is writing a program to store roman numbers and find their equivalents using a dictionary. He has written the following code. As a programmer, help him to successfully execute the given task.

```
import _________ #Line 1
numericals = {1: 'I', 4 : 'IV', 5: 'V' , 9: 'IX', 10:'X', 40:'XL',50:'L', 90:'XC', 100:'C',
```

```
    400:'CD',500:'D',900:'CM',1000:'M'}
file1 = open("roman.log","_______") #Line 2
pickle.dump(numerals,file1)
file1.close()
file2 = open("roman.log",'_________") #Line 3
num = pickle._______(file2)       #Line 4
file2._____________ #Line 5
n = 0
while n!=-1:
     print("Enter 1,4,5,9,10,40,50,90,100,400,500,900,1000:")
     print("or enter -1 to exit")
     n = int(input("Enter numbers"))
     if n!= -1:
          print("Equivalent roman number of this numeral is:",num[n])
     else:
          print("Thank You")
```

(i) Name the module he should import in Line 1

a) csv
b) binary
c) pickle
d) file

Answer – (c) pickle

(ii) In which mode, Amit should open the file to add data into the file in Line #2 without losing the previous contents

a) wb
b) a
c) w+
d) ab

Answer – (d) ab

(iii) Fill in the blank in Line 3 to read the data from a binary file.

a) rb
b) r+
c) w+
d) wb

Answer – (a) rb

(iv) Fill in the blank in Line 4 to read the contents of the file "roman.log"

a) read()
b) reader()
c) dump()
d) load()

Answer – (d) load()

(v)Fill in the blank in Line 4 to close the file.

a) close(file2)
b) close()
c) end()

d) close("Roman.log")
Answer – (b) close()

4. Manisha has been asked to write a code to count and display the no. of lines that starts with 'S' in a text file MyFile.txt. She is not confident with few statements and left it blank. Help her complete the code.

```
myfile = open(_____)          # line1
line_count = 0
data = _____          # line2
for line in data:
   if _____ == 'S':          # line3
      line_count += 1
print("No. of lines that start with S:",_____)      # line4
myfile._____       # line5
```

(i) Select correct option to open file in read mode in line1.
a) "MyFile.txt", 'r+'
b) "MyFile.txt", 'r'
c) "MyFile.txt", 'rb'
d) "MyFile.txt", 'a'
Answer – (b)

(ii) Write the function in line2 to read all the lines of the file.
a) myfile.readline()
b) myfile.read()
c) myfile.reader()
d) myfile.readlines()
Answer – (d)

(iii) What should come at line3 to compare the first character of the line.
a) data[0]
b) line[0]
c) line[1]
d) line['S']
Answer – (b)

(iv) Select the correct option for line4 to display no. of records that starts with 'S'.
a) count
b) line_count+1
c) count+1
d) line_count
Answer – (d)

(v)Which statement should be used in line5 to close the file 'Myfile.txt'?
a) close(myfile)
b) close()
c) end()
d) close("MyFile.txt")
Answer – (b)

FILL IN THE BLANKS

1. A collection of bytes stored in computer's secondary memory is known as _____.
2. _____ is a process of storing data into files and allows to performs various tasks such as read, write, append, search and modify in files.
3. The transfer of data from program to memory (RAM) to permanent storage device (hard disk) and vice versa are known as _____.
4. A _____ is a file that stores data in a specific format on secondary storage devices.
5. In _____ files each line terminates with EOL or '\n' or carriage return, or '\r\n'.
6. To open file data.txt for reading, open function will be written as f = _____.
7. To open file data.txt for writing, open function will be written as f = _____.
8. In f=open("data.txt","w"), f refers to _____.
9. To close file in a program _____ function is used.
10. A _____ function reads first 15 characters of file.
11. A _____ function reads all bytes in the form of a string.
12. A _____ function reads all lines from the file.
13. A _____ function requires a string (File_Path) as parameter to write in the file.
14. A _____ function requires a sequence of lines, lists, tuples etc. to write data into file.
15. To add data into an existing file _____ mode is used.
16. A _____ function is used to write contents of buffer onto storage.
17. A text file stores data in _____ or _____ form.
18. A _____ is plain text file which contains list of data in tabular form.
19. You can create a file using _____ function in python.
20. A _____ symbol is used to perform reading as well as writing on files in python.

Answers:

1. File
2. File Handling
3. I/O Operations
4. Data file
5. Text File
6. open("data.txt","r")
7. open("data.txt","w")
8. File handle or File Object
9. close
10. read(15)
11. read()
12. readlines()
13. write()
14. writelines()
15. append
16. flush()
17. ASCII, UNICODE
18. CSV
19. open()
20. +

SHORT ANSWER QUESTIONS(2/3 marks)

1. What is the significance of 'r+' in file handling?

Ans - Both read and write can be performed, file must exist

2. Write a statement in Python to open a binary file named "First.dat" and add contents to it without losing its contents.

Ans - F=open("First.dat,"ab")

3. What is the advantage of using 'with' clause in file handling for opening a file?

Ans - With keyword reduces the overheads involve in file handling operations like closing the file after operation or handling the file closing with exceptions. When file is opened using "with" it will manage these things i.e. file will be automatically closed after operations. It ensures the closing of file even if exceptions arises.

4. Read the following Python code carefully and answers the question given after the code.

```
import pickle
infile = open('phonebook.dat', '_____') #Line 1
phonebook = _____(infile) #Line 2
print(phonebook)
infile.close()
```

a. Fill in the blank in line 1 to open file in binary mode for reading.
b. Fill in the blank in line 2 to read object from file.

Ans - (a) rb
(b) pickle.load

5. Suppose content of 'Myfile.txt' is:

Twinkle twinkle little star
How I wonder what you are
Up above the world so high
Like a diamond in the sky

What will be the output of the following code?

```
myfile = open("Myfile.txt")
data = myfile.readlines()
print(len(data))
myfile.close()
```

Ans - Output - 4

6. What is the difference between readline() and readlines() function in file handling?

Ans - readline() : Reads a line of the file and returns in form of a string. For specified n, reads at most n bytes. However, does not reads more than one line, even if n exceeds the length of the line.

readlines() : Reads all the lines and return them as each line a string element in a list.

7. Write a Python program to find the number of lines in a text file 'diary.txt'.

Ans -

```
with open("diary.txt", 'r') as fp:
    lines = len(fp.readlines())
    print('Total Number of lines:', lines)
```

8. Write a function that counts and display the number of 5 letter words in a text file “Sample.txt”

Ans -
```
def count_words( ):
    c = 0
f = open("Sample.txt")
line = f.read()
word = line.split()
for w in word:
    if len(w) == 5:
        c += 1
print(c)
```

9. How are the following codes different from one another?

1) M=open(“poem.txt”,”r”)
M.read()
2) M=open(“poem.txt”,”r”)
M.read(10)

Ans – (1) reads all the contents of the file
(2) reads the first 10 bytes of the file

10. Write a python program to create and read the city.txt file in one go and print the contents on the output screen.

Answer:
```
# Creating file with open() function
f=open("city.txt","w")
f.write("My city is very clean city.")
f.close()
# Reading contents from city.txt file
f=open("city.txt","r")
dt = f.read()
print(dt)
f.close()
```

11. Consider following lines for the file friends.txt and predict the output:

Friends are crazy, Friends are naughty !
Friends are honest, Friends are best !
Friends are like keygen, friends are like license key !
We are nothing without friends, Life is not possible without friends !

```
f = open("friends.txt")
l = f.readline()
l2 = f.readline(18)
ch3=f.read(10)
print(l2)
print(ch3)
print(f.readline())
f.close()
```

Answer - Friends are honest
, Friends
are best !

12. Write a function display_oddLines() to display odd number lines from the text file. Consider the file – friends.txt.

Answer -

```
def display_oddLines():
    f = open("friends.txt")
    cnt =0
    for lines in f:
        cnt+=1
        if cnt%2!=0:
            print(lines)
    f.close()
```

13. Write a function cust_data() to ask user to enter their names and age to store data in customer.txt file.

Answer -

```
def cust_data():
    name = input("Enter customer name:")
    age=int(input("Enter customer age:"))
    data = str([name,age])
    f = open("customer.txt","w")
    f.write(data)
    f.close()
```

14. Write a function VowelCount() in Python, which should read each character of a text file Story.txt, should count and display the occurrence of alphabets vowels.

Example: If the file content is as follows:

Updated information As simplified by official websites.

The VowelCount() function should display the output as:

A or a:4
E or e :4
I or i :8
O or o : 0
U or u: 1

Answer –

```
    def VowelCount():
 count_a=count_e=count_i=count_o=count_u=0
 f= open('MY_TEXT_FILE.TXT', 'r')
 d=f.read()
 for i in d:
 if i.upper()=='A':
    count_a+=1
 elif letter.upper()=='E':
    count_e+=1
 elif letter.upper()=='I':
    count_i+=1
 elif letter.upper()=='O':
     count_o+=1
 elif letter.upper()=='U':
    count_u+=1
 print("A or a:", count_a)
```

```
print("E or e:", count_e)
print("I or i:", count_i)
print("O or o:", count_o)
print("U or u:", count_u)
```

15. A binary file “STUDENT.DAT” has structure [admission_number, Name, Percentage]. Write a function countrec() in Python that would read contents of the file “STUDENT.DAT” and display the details of those students whose percentage is above 75. Also display number of students scoring above 75%.

Answer –

```
import pickle
def countrec():
    fobj=open("student.dat","rb")
    num = 0
    try:
            while True:
                rec=pickle.load(fobj)
                if rec[2]>75:
                    num = num + 1
                    print(rec[0],rec[1],rec[2])
    except:
            fobj.close()
    return num
```

DATA STRUCTURE

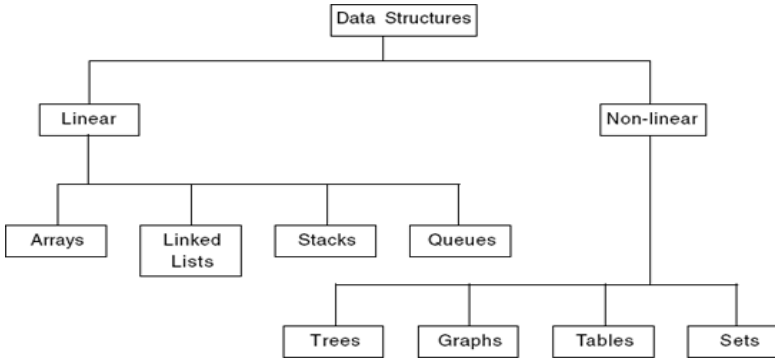
Basic concepts of Data Structure

Definition: The logical or mathematical model of a particular organization of data is called data structure. It is a way of storing, accessing, manipulating data.

Types of data structure:

There are two types of data structure:

1. **Linear data structure**: It is simple data structure. The elements in this data structure creates sequence. Example: Array, linked list, stack, queue.
2. **Non-Linear data structure**: The data is not in sequential form. These are multilevel data structures. Example: Tree, graph, table, set.



Operation on data structure:

There are various types of operations can be performed with data structure:

1. **Traversing**: Accessing each record exactly once.
2. **Insertion:** Adding a new element to the structure.
3. **Deletion**: Removing element from the structure.
4. **Searching**: Search the element in a structure.
5. **Sorting**: Arrange the elements in ascending and descending order.
6. **Merging**: Joining two data structures of same type.

Stack:

- A stack is a collection of data items that can be accessed at only one end, called top.
- Items can be inserted and deleted in a stack only at the top.
- The last item inserted in a stack is the first one to be deleted. Therefore, a stack is called a Last-In-First-Out (LIFO) data structure.
- Two main operations on Stack are PUSH & POP
- PUSH means inserting new item at top and POP means deleting item from top.

Terms related to stack:

Peek:	getting the most recent value of stack i.e., value at TOP
Overflow:	a situation when we are pushing item in stack that is full.
Underflow:	a situation when we are popping item from empty stack.

Menu based program for stack implementation using list:

```
stk=[]
top=None
def push(stk,item):
    stk.append(item)
    top=len(stk)-1

def pop(stk):
    if stk==[]:
        return "underflow"
    else:
        x=stk.pop()
        if stk==[]:
            top=None
        else:
            top=len(stk)-1
        return x

def peek(stk):
    if stk==[]:
        return "underflow"
    else:
        top=len(stk)-1
        return stk[top]

def  display(stk):
    if stk==[]:
        print("Underflow")
    else:
        print ("Top === >",end= " ")
        for item in stk[::-1]:
            print(item)

while True:
    print("============Stack Implementation===========\n\n")
    print("Enter 1 for Push : ")
    print("Enter 2 for Pop : ")
    print("Enter 3 for peek : ")
    print("Enter 4 for dispaly : ")
    print("Enter 5 for exit : ")
    ch=int(input("Enter your choice : "))

    if ch==1:
```

```
        item= int(input("Enter your item for PUSH : "))
        push(stk,item)

    elif ch==2:
        val=pop(stk)
        print(val)

    elif ch==3:
        val=peek(stk)
        print(val)

    elif ch==4:
        display(stk)

    elif ch==5:
        break

    else:
        print("Your choice is incorrect : ")
```

Very Short Answer Type Questions(1-mark)

1. **What do you mean by Data Structure?**

Ans: Data Structure means organization of data. A data structure has well defined operations or behavior.

2. **Name the data structure that follow FIFO order?**

Ans: QUEUE

3. **Name the data structure that follow LIFO order?**

Ans: STACK

4. **What is peek operation?**

Ans: Getting the most recent value of stack i.e., value at TOP

5. **Name one linear data structure.**

Ans: Lists

6. **Name one non-linear data structure.**

Ans: Graphs

7. **Name the operation for insertion in a stack.**

Ans: PUSH

8. **Name the operation for deletion from a stack.**

Ans: POP

9. **Name the end where insertion/deletion perform in stack.**

Ans: Top

10. **Ramesh is trying to pop an element from empty Stack. Name the condition that he will face?**

Ans: Underflow

Short Answer Type Questions (2-marks)

1. **How is Data Structure different from Data Type?**
   Ans: Data Structure provides information regarding organization of data whereas Data Type provides information regarding thedomain of values and operations that can be perform on data.
2. **Define Stack and write the name of main operations performed on Stack**
   Ans: Stack – A stack is a linear list also known as LIFO list with the special property that items can be added or removed from onlyone end called the top.
   There are two main operations used in stack:
   Push: to insert an element
   Pop: to delete an element
3. **Name some operations commonly performed on data structures?**
   Ans: Traversal, Insertion, Deletion, Searching, Sorting, Merging etc.
4. **What is traversing? Write a function to traverse a Stack.**
   Ans: Traversing means accessing or visiting or processing each element of any data structure.

```
def traverse(stk):
    if stk==[]:
        print("Underflow")
    else:
        print ("Top === >",end= " ")
        for item in stk[::-1]:
            print(item)
```

5. **Write some applications of stack.**
   Ans: Reversing a string, compilers uses stack to store previous state of program, undo mechanism in text editors and backtracking.
6. **Describe similarities between stack and queue.**
   Ans: i) Both are special cases of linear list
   ii) Both can be implemented as list.
7. **Describe differences between stack and queue.**
   Ans: i) A Stack is LIFO and Queue is FIFO
   ii) Queue can be circular whereas Stack cannot.
8. **What is the purpose of top and pop?**
   Ans: Top operation examines the element in the top of the list and returns its value. Pop operation deletes the element at the top of the stack and decrements the top of the stack pointer by one.

Application based Short Answer Type Questions(2-marks)

1. **Predict the output with respect to the Stack implemented using list:**
   stk=[11,22,25,40,60,45]

(a) print(stk)	Ans: [11,22,25,40,60,45]
(b) print(len(stk))	Ans: 6
(c) stk.pop() ; print(stk)	Ans:45 [11,22,25,40,60]
(d) stk.append(30); print(stk)	Ans: [11,22,25,40,60,30]

2. Predict the output of following print statement with respect to the Stack , if push() is used to append the element in Stack and Top holding the greatest index value of Stack :

Record=[[11,"Rohit"],[12,"John"],[13,"Sonal"]]

a) print(len(Record))	Ans: 3
b) print(Record[Top])	Ans: [13,"Sonal"]
c) pop(); pop(); push([15,"Ronit"]); print(Record)	[[11,"Rohit"],[15,"Ronit"]
d) print(Record[Top][1])	Ans: 'Ronit'

3. Predict the output of stack after performing the following operation:

Stk=[]

Push 5 Pop Push 7 Push 2 Push 10 Push 9 Pop Pop Push 5

(a)print(Stk) (b) print(Top)

Ans: a) [7,2,5] b) 5

4. Consider STACK=['a','b','c','d']. Write the STACK content after each operations:

a) STACK.pop( )	Ans: ['a', 'b', 'c']
b) STACK.append('e')	Ans: ['a', 'b', 'c','e']
c) STACK.append('f')	Ans: ['a', 'b', 'c','e','f']

5. Write a function to implement Push operation on stack.

Ans:

```
def PUSH(stk,student):
        stk.append(student)
        top=len(stk)-1
```

6. Write a function to implement Pop operation on stack.

Ans:

```
def pop(stk):
   if stk==[]:
      return "underflow"
   else:
      x=stk.pop()
      if stk==[]:
         top=None
      else:
         top=len(stk)-1
      return x
```

3 Marks (Application Based Questions)

1. Write a function in Python PUSH(Num), where Num is a list of integer numbers. From this list push all positive even numbers into a stack implemented by using a list. Display the stack if it has at least one element, otherwise display appropriate error message.

Ans:

```
def PUSH(Num):
   s=[]
   for x in Num:
      if x%2==0 and x>0:
```

```
        s.append(x)
    if len(s)==0:
       print("STACK EMPTY")
    else:
       print(s)
```

2. **Write a function in Python POP(cities), where cities is a stack implemented by a list of city names for eg. cities=[‘Delhi’, ’Jaipur’, ‘Mumbai’, ‘Nagpur’]. The function returns the value deleted from the stack.**

Ans:

```
    def POP(cities):
       #For empty stack
       if (len(cities)==0):
          print("Under flow")
       else:
          P=cities.pop()
          if len(cities)==0:
               Top=None
          else:
               Top=len(cities)-1
       return P
```

3. **Write a function in Python PUSH(Arr), where Arr is a list of numbers. From this list push all numbers divisible by 5 into a stack implemented by using a list. Display the stack if it has at least one element, otherwise display appropriate error message.**

Ans:

```
    def PUSH(Arr,value):
    s=[]
        for x in range(0,len(Arr)):
            if Arr[x]%5==0:
                    s.append(Arr[x])
    if len(s)==0:
       print("Empty Stack")
    else:
       print(s)
```

4. **Write a function in python, PushEl(e) to add a new element and PopEl(e) to delete a element from a List , considering them to act as push and pop operations of the Stack data structure .**

Ans:

```
def PushEl(element):
    a=int(input("enter package title : "))
    element.append(a)

def PopEl(element):
    if (element==[]):
            print( "Stack empty")
    else:
```

```
        print ("Deleted element:", element.pop())
```

5. **Write a function POP(Book) in Python to delete a Book from a list of Book titles, considering it to act as a pop operation of the Stack data structure.**

Ans:

```
def POP(Book):
    if (Book ==[]):
        print("Stack empty")
    else:
        print("Deleted element :", Book.pop())
```

6. **Write a function in Python PushBook(Book) to add a new book entry as book_no and book_title in the list of Books , considering it to act as push operations of the Stack data structure.**

Ans:

```
def PushBook(Book):
    bno = input("enter book no : ")
    btitle = input("enter book title:")
    rec = [bno, btitle]
    Book.append(rec)
    print(Book)
```

7. **Write a function AddCustomer(Name) in Python to add a new Customer information NAME into the List of CStack and display the information.**

Ans:

```
def AddCustomer(Name):
    CStake.append(Customer)
    if len(CStack)==0:
        print ("Empty Stack")
    else:
        print (CStack)
```

8. **Write a function DeleteCustomer() to delete a Customer information from a listof CStack. The function delete the name of customer from the stack**

Ans:

```
def DeleteCustomer():
    if (CStack ==[]):
        print("There is no Customer!")
    else:
        print("Record deleted:",CStack.pop())
```

Study Material

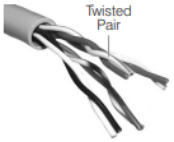
Session- 2022-23

COMPUTER NETWORKS (Class XII- CS)

- **COMPUTER NETWORK DEFINITION –** Group of two or more computers interconnected with each other to share data and resources. Eg- Internet is network of computers worldwide.
- **EVOLUTION OF NETWORKING –**
  i) 1st network - Advanced Research Projects Agency Network (**ARPANET**) , 1969 , used by US Defence Dept.
  ii) 1971 – Email , 1983 – Domain Name/ Website Name System Launched, 1990 – HTML, WWW,URL Developed and Internet came into existence , 1997 – Wifi , 1998 - Google Search Engine
- **WHAT IS INTERNET?** – Global / World Wide Network / Network of Networks – It is a network of computers worldwide, either wired or wireless.
- **WHAT IS INTRANET?** - A local network within an organization. Eg- Inside one school, hospital etc.
- **BENEFITS** for networking / connecting computers together – Optimal resource utilisation, File/Hardware/Application Sharing, Easy and Fast Communication, Reliability, Remote Accessibility, On Demand Storage facility and Services, Security and Protection of organisation private data.
- **DATA COMMUNICATION TERMINOLOGIES** –
  CHANNEL – Medium/Path/Material of data transmission. Eg- Wired / Wireless / Cables etc.
  BAND WIDTH - Difference between the highest and lowest frequencies. Measured in terms of "Hertz" like Hz, KHz, MHz etc. Larger the bandwidth, higher the transmission speed / actual speed.
  DATA TRANSFER RATE - Amount of data transferred per second. Measured in terms of used bps (Bits Per Second), Bps (Bytes per second) , kbps,mbps etc. eg- Jio download speed generally 1-25 MBps.
- **SWITCHING TECHNIQUES –** There are two ways of sending data across the network –

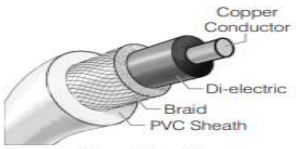
Circuit Switching	Packet Switching
Circuit switching requires a dedicated path before sending data from source to destination.	Packet switching does not require any dedicated path to send data from source to destination.
It reserves the entire bandwidth in advance.	It does not reserve bandwidth in advance
No store and forward transmission	It supports store and forward transmission
Each packet follows the same route	A packet can follow any route
Call setup is required	No call setup is required
Bandwidth wastage	No bandwidth wastage

- **TRANSMISSION MEDIA -** Two types WIRED and WIRELESS.
  1) WIRED MEDIA – Cables / Wires – 3 Types -Twisted Pair Cable, Co-axial Cable, Optical Fibre Cable



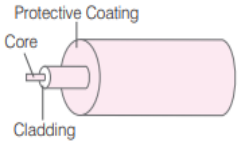
i) **Twisted Pair Cable** – aka Ethernet/ LAN Cable –
- Wires are twisted together, which are surrounded by an insulating material
- Generally used as internet cable inside LAN of an organisation / school/ hospital.

- Advantages - Very inexpensive/ Cheaper than Coaxial/Optical Fibre, Easy and flexible to install
- Disadvantages- High attenuation, signals cannot be transported over 100 meter without using repeaters, Support low data speed as compared to other cables, Can't be used for broadband.

ii) **Co-axial Cable** – 

Co-axial cable aka Home TV Cable –

- Consists of a solid wire core surrounded insulating material and wire mesh.
- Advantages - Offers high bandwidth, transmission speed, quality than twisted pair cable, Can transmit several channels simultaneously and hence can be used for broadband.
- Disadvantages- Expensive compared to twisted pair cable, Difficult to manage and reconfigure as compared to twisted pair cable.

iii) **Optical Fibre Cable** – 

aka High Speed Internet Cable –

- Consists of thin threads made up of glass, which are capable of carrying light signals from a source at one end to another end.
- Advantages – Offers very high bandwidth, transmission speed, quality than other cables, Can transmit several channels simultaneously and hence can be used for broadband , Immune to electrical and magnetic fields.
- Disadvantages- Expensive compared to other cable, Fragile, difficult to connect and install.

2) WIRED MEDIA –

Waves – 3 Types – Infrared, Radio waves, Microwave

Wireless Technology – Bluetooth, Satellite , WiFi , WiMax

INFRARED - High frequencies, allow high speed data transmission, Line-of-sight transmission and can't penetrate through walls, trees etc. , Used in remotes of TV,AC etc.

RADIOWAVE – Used for short distance communication eg- Used for transmitting signals from mobile towers to our mobile phones , No need of line of sight, Can penetrate through walls, trees etc. , Cheaper to use than wired network, Used in AM and FM radio, television, cordless phones

MICROWAVE – Used for long distance telephonic communications. Eg- From tower to tower, Repeaters are used at regular intervals (25-30 kms). The data signals are received, amplified and then retransmitted, Can penetrate through walls, trees etc. but needs line of sight, hence Mobile towers are placed on top of the buildings.

BLUETOOTH - Used for exchanging data over a short distance wirelessly. Approx range 10 meter, Data transfer rate is slower than wired and wifi.

SATELLITE COMMUNICATION – Expensive and used for long distance communication such as between countries and continents, TV Signals, Especially used for remote locations, difficult to reach with general wired and wireless infrastructure, Also used to provide secure connection to military and VVIP persons such President, PM etc.

WIFI – Stands for Wireless Fidelity, aka Wireless LAN or 802.11, Range around 100 meter, Used to provide wireless internet, Uses Radio Waves

WIMAX – Stands for Worldwide Interoperability for Microwave Access , Similar to wifi but uses Microwaves and large range of around 50 km, Expensive than Wifi

- **NETWORK DEVICES -** Modem, RJ45 connector, Repeater, Ethernet Card, Hub, Router, Switch, Gateway

MODEM - Stands for MODulator DEModulator , Used to covert analog to digital signals and vice versa.

RJ45 CONNECTOR – Stands for Registered Jack – 45 , Eight-pin connector used exclusively with Ethernet cables for networking.

REPEATER - Repeater is an analog device that regenerates/boost weak signals, Required after every 100 meter in Ethernet / LAN Cables.

ETHERNET CARD – aka Network Interface Card (NIC), It is a network adapter installed in your computer and acts as an interface between computer and the network. Each NIC has a MAC address, which helps in uniquely identifying the computer on the network.

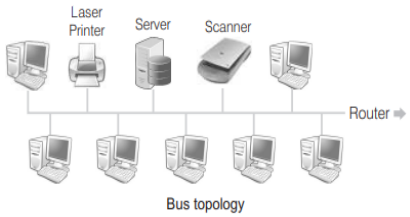
HUB - a network device used to connect different devices through wires, Cheaper and less Intelligent than Switch , Broadcast signals i.e send signal to all connected computers.

SWITCH - A network device used to connect different devices through wires, Costly and Intelligent than Hub, Unicast signals i.e send signal to only the destination node, Uses MAC Address to find out the destination node.

ROUTER - A network device used to connect different devices through wires, Intelligent and costly than Hub and Switch, Unicast signal and that too through shortest path possible, Uses IP Adresses to create a routing table and decide shortest path on basis of it, Capable of connecting different networks also such as wired lan and wireless wifi, Converting big data packets of one network to small packets supported by destination different network.

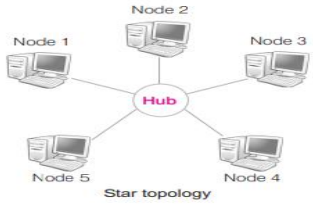
GATEWAY - Gateway serves as the entry and exit point of a network, Maintain information about the routing paths of data packets, the host network's internal connection paths and the identified paths of other remote networks. Gateway can be software, hardware or both. Gateway consists of firewall which provide functionalities such as access controls, security, virus protection , admin controls etc., In our homes our Internet Service Provider (ISP) such as Jio act as gateway, In school, office 1st router acts as gateway.

- **NETWORK TOPOLOGIES** – Bus, Star, Tree, Mesh
  Topology Definition – The type of arrangement of computers and other peripherals in a network is called its topology.



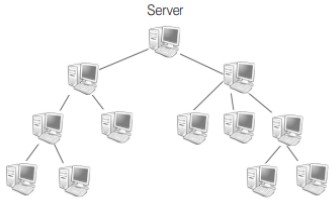
Bus topology

BUS TOPOLOGY – Computers and the peripheral devices are connected to a common single data line / central cable.
Advantages – Cheapest as shortest cable length required as compared to other topologies, Simple and Easy to install and maintain, Easy to scale / expand / add new nodes
Disadvantages – Fault Detection is difficult, Becomes slow with increase in number of nodes, Failure of one single computer bring down the entire network.



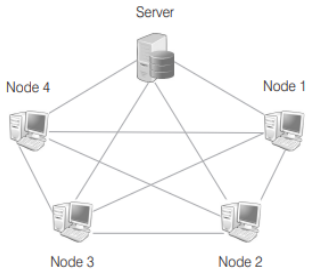
Star topology

STAR TOPOLOGY – Computers and the peripheral devices are connected through a central device such as Hub / Switch .
Advantages –Simple and Easy to install and maintain, Fault detection easy, Failure of single system will not bring down the entire network.
Disadvantages – Difficult to expand, If central device fails then whole network goes down, Expensive than BUS as uses more cable length.



Tree topology

TREE / HYBRID TOPOLOGY – Combination of both BUS and STAR topologies, Its basic structure is like an inverted tree, where the root acts as a **server**.
Advantages - Easy to expand and extend, Fault detection easy, Support hierarchical flow of data and control, Failure of single system will not bring down the entire network
Disadvantages –If root server device fails then whole network goes down, Long cables are required, Installation and reconfiguration is difficult.



Mesh topology

MESH TOPOLOGY - Every node has a dedicated point-to-point / direct link to every other node.
Advantages – Highly reliable as multiple alternate paths available if one path fails,
Can handle large amount of traffic
Disadvantages – Long wire/cable length is required, Complex to setup.

- **NETWORK TYPES** – On the basis of coverage of area - PAN, LAN, MAN, WAN
  PAN – Stands for Personal Area Network. Area Range around 10 meter. Small Network Organised around an individual. It can be wired or wireless. Eg of PAN are Bluetooth, USB, Mouse, Wireless Keyboard etc.
  LAN – Stands for Local Area Network. Area Range around 1 km. Network inside an Office,School, Hospital, Company etc. It can be wired or wireless.
  MAN – Stands for Metropolitan Area Network. Area Range around 30-40 kms. Network inside a city, big village, district etc.
  WAN - Stands for Wide Area Network. Area Range > 40 kms. Network inside a state, country and the whole world. Internet is an example of WAN.

- **NETWORK PROTOCOLS –**
  Protocol Definition - : Set of rules for communication among networked devices. These include how and when a device can send and receive data, how it is packaged, how it reaches its destination etc.Commonly used Protocols mentioned in our syllabus are –

TCP – stands for Transmission Control Protocol. Divides the data into packets for transmitting and re-assemble received packets at the destination.
IP - stands for Internet Protocol. Responsible for routing the data packets to correct destination, Provide unique IP Address for every device connected to internet.
PPP- stands for Point-to-Point Protocol. PPP is used with dial-up Internet connections including ISDN. Used for transmitting the IP data packets over usual telephone lines.
FTP- stands for File Transfer Protocol -Used for transfer of files (upload/download) to or from a remote server.
HTTP - stands for Hyper Text Transfer Protocol- Transfer data from one device to another on the world wide web.
HTTPS - stands for Hypertext Transfer Protocol Secure. Advanced and secure version of HTTP.
GSM - stands for Global System for Mobile Communication. GSM technology is used for transmitting voice and data using **SIM (Subscriber Identification Module)** cards in our mobiles.
GPRS – stands for General Packet Radio Service. Transmission of IP packets over existing cellular networks. Multi-media Message Service (MMS), Internet Access via Mobiles and Data Communication.
WLL – stands for Wireless Local Loop. It is a generic term for an access system that uses wireless links rather than conventional copper wires to connect subscribers to the local telephone company's switch.
TELNET – aka Remote Login.Used for creating a connection with a remote Computer.
Email Protocols – SMTP , POP3 - Simple Mail Transfer Protocol (SMTP) is used for sending E-mail over the Internet.Your E-mail client uses SMTP to send a message to the mail server and the mail server uses SMTP to relay/further send that message to the correct receiving mail server.
POP3 - Post Office Protocol version 3 - Used to retrieve/download E-mail from a remote server to a local email client. Once Retrieved emails can be read offline later.
VoIP – stands for Voice over Internet Protocol. Enables voice communications over the Internet through the compression of voice into data packets. Eg- Whatsapp/Google Duo voice / video call uses VoIP in background.
VoLTE – stands for Voice over Long Term Evolution.Enables high speed voice and data communications over the 4G / LTE Networks.

- **MOBILE TELECOMMUNICATION TECHNOLOGIES:**

MOBILE TELECOMMUNICATION TECHNOLOGIES: [1 mark full form / feature]
Mobile is a device which is portable. Mobile communication is based on cellular networks.
{A cellular network is radio network - land is divided into areas called cells. The network of cells enables the mobile devices to communicate even if they are moving from one cell to another via base stations.}
Mobile Systems (G = Generation)

1 G	2 G	2.5 G	3 G
introduced in late 1970s and early 1980s; **analog cellular** technology	introduced in early 1990s; based on **GSM technology**; by swapping out the **SIM card**, users can switch phones or providers.	using **packet switched domain**	Adds multi-media facility to 2G - **allowing video, audio, and graphics** applications ; {Year 2000 – 2010 }
Only **voice facility** available ; based on **circuit-switched** technology	used **circuit switching** ; Both **voice and data conversations** were digitally encrypted	used **GPRS** (General Packet Radio Service) **in addition to GSM.**	Watching **streaming video** or **video telephony** became a reality (Mobile TV) ;
Low capacity , poor voice links and **no security**	Known for **paging, SMS, voicemail and fax services**	Services like **MMS**, sending **pictures through e-mail** possible	**Data rates up to 2 Mbps**; Technologies used – UMTS, EDGE, CDMA

Some terms we need to be familiar with –
FDMA - Frequency Division Multiple Access. **CDMA - Code Division Multiple Access.**
TDMA - Time Division Multiple Access.

4G Mobile Systems = Based on **packet switching only (IP based).** { Year 2010 -2020 };
Bandwidth – 100Mhz ; Term used for 4G is **MAGIC**

Mobile multimedia	**A**nytime, anywhere Fast transmission 100Mbps – 1Gbps	**G**lobal mobile support	**I**ntegrated wireless solutions (uses LTE and Wi-Max)	**C**ustomized personal service

{4G LTE = Fourth Generation Long Term Evolution} 4G can provide **better-than-TV quality images and video-links , supports interactive multimedia, voice and video**

5G Mobile Systems = uses **orthogonal frequency-division multiplexing (OFDM) framework**; radio millimeter bands in the 30 GHz to 300 GHz range. **More faster data transmission than 4G, data rate from 1 Gb and above** { From year 2020 onwards }. Highly interactive multi-media, voice streaming, **more efficient**.

- **MOBILE PROCESSOR -**
  Like CPU in a computer system, mobile processor receives and executes every command, performing billions of calculations per second.
  Components of Mobile Processors - Mainly the following three -
  1. **Application Processing Unit** = Has the Control Unit of the mobile's CPU (Central Processing Unit)
  2. Graphics Processing Unit = Assists the CPU for handling the graphics.
  3. Communications Processing Unit = for calling and call receiving via the phone's middleware
  A few more components in smartphone's processors -
  a. Camera ISP (Image Signal Processing) b. Radio and 3G / 4G Modem
  c. Memory Controller d. Audio / Video Engine

- **COMPUTER THREATS -**
  Viruses – Vital Information Resource Under Siege; Viruses are small programs that are written intentionally to damage the data and files on a system; computer slows down; programs malfunction; files destroyed. . Some well-known viruses include CryptoLocker, ILOVEYOU, MyDoom, Sasser and Netsky etc.
  Worms - a self-replicating program that runs independently. Unlike a virus, a worm does not need a host program or software to insert its code into. Worms are standalone programs that are capable of working on its own. Worms cause more damage. Examples of worms include Storm Worm, Sobig, MSBlast, Code Red, Nimda etc.
  Trojan horse - a kind of virus that looks safe but has hidden effects. It looks like a legitimate software and once it tricks a user into installing it, it acts pretty much like a virus or worm.
  Ransomware - Type of malware that targets user data. It either blocks the user from accessing their own data or threatens to publish the personal data online and demands ransom payment against the same. Popular example- WannaCry , in 2017, infected almost 200,000 computers across 150 countries.
  Spyware - It records/collects the user/company data and sends the collected information to an external entity without consent or knowledge of the user.
  Adware - is a malware that is created to generate revenue for its developer. An adware displays online advertisements using pop-ups, web pages, or installation screens. usually annoying, but harmless.
  Spam - Unwanted bulk mail which is sent by an unauthorized or unidentified person in order to eat the entire disk space.
  Keyloggers - record the keys pressed by a user on the keyboard and send it to external entity in background. Using it very sensitive and personal information like passwords, emails, private conversations, etc. can be revealed to an external entity without the knowledge of the user.
  HACKING - Accessing a computer without authorization by engaging in harmless technical experiments and fun learning activities, using computer programming skills etc.

CRACKING - A method by which a person gains unauthorized access to a computer with the intention of causing damage.

- **THREAT PREVENTION** – PREVENTIVE MEASURES AGAINST THREATS - 1.Using antivirus, anti-malware, and other related software and updating them on a regular basis. 2. Always check for https and a green padlock in the address bar while making payments online. 3. Never use pirated on unlicensed software. Instead go for Free and Open Source Software (FOSS). 4. Applying software updates and patches released by its manufacturers. 5. Taking a regular backup of important data. 6. Enforcing firewall protection in the network. 7. Avoid entering sensitive (passwords, pins) or personal information on unknown or public computers.8. Avoid clicking on links or downloading attachments from unsolicited emails. 9. Scan any removable storage device with an antivirus software before transferring data to and from it. 9. Remove all the programs that you don't recognise. 10. Set strong passwords having atleast leangth of 8 characters and consisting of lower, upper, special chars and numbers.
  Firewall - A hardware or software or both that is used to prevent unauthorized access to or from a computer network. Gateway in a network are preloaded with firewall. Also, Antivirus provides personal firewall to your computer.
  HTTPS - stands for Hypertext Transfer Protocol Secure. Advanced and secure version of HTTP.

- **CYBER LAW -** Legal system of laws and regulatory aspects of issues of the internet. It can be local or international.
  CYBERCRIME - aka Computer-oriented crime, is a crime in which a computer and internet is used. Cybercrimes can be against persons or against organisations or against the government
- **INDIAN IT ACT -** "INFORMATION TECHNOLOGY ACT, 2000" [ITA- 2000] – Govt of India enacted to Indian IT act in 2000 to define penalties and punishments related to Cyber Crimes.
  The above Act was further amended/updated in 2008.
- **IPR - INTELLECTUAL PROPERTY RIGHTS –**
  Intellectual property rights are the rights given to persons over the creations of their minds.
  Examples of IPR - Patents, Trademarks, Plant Varieties, Copyrights, Trade secrets, Industrial Design rights etc.
  Patent – Issued for new research and innovation. Eg- Covid Vaccine, 3D Printer
  Trademark – Issued for unique logo, slogan, tagline, product design etc. eg- Apple,Nike logo trademarks
  Copyright – Issued automatically without applying for audio, video, book, software etc.
  IPR ISSUES AND VIOLATIONS –
  Plagiarism – Copying / Stealing someone's copyrighted work without giving giving due creadit to the original author.
- **WEB SERVICES :**
  WWW : World Wide Web is a combination of all resources and users on the Internet that are using the Hypertext Transfer Protocol (HTTP) ; Sir Tim Berners -Lee (Born in London, UK) is the inventor of WWW.

Website	**Webpage**
Collection of webpages	Webpage is part of website
Each website has specific internet address (URL) by which we can access the website	Webpages have hyperlinks to connect one web page to another in the website
Example - http://cbseacademic.nic.in/ More examples - amazon.com, flipkart.com, google.com	Example – curriculum_2021.html is a webpage of the CBSE website. http://cbseacademic.nic.in/curriculum_2021.html
All publicly accessible websites collectively constitute the **World Wide Web**	

WEBSITE TYPES – TWO – STATIC AND DYNAMIC -

Static Website	Dynamic Website
Content of Web pages can not be change at runtime.	Content of Web pages can be changed.
No interaction with database possible.	Interaction with database is possible
It is faster to load as compared to dynamic website.	It is slower than static website.
Cheaper Development costs.	More Development costs.
No feature of Content Management.	Feature of Content Management System.
HTML, CSS, Javascript is used for developing the website.	Server side languages such as PHP, Node.js are used.
Same content is delivered everytime the page is loaded.	Content may change everytime the page is loaded.
Example – Ncert textbook website	eg- Twitter, Times of India News Website

WEB BROWSER - Web browser is software program to navigate the web pages on the internet. Examples - Google Chrome , Mozilla Firefox, Apple Safari, Internet Explorer etc.

WEB HOSTING -
Web hosting is the process of uploading/saving the web content on a web server to make it available on WWW (World Wide Web).

WEB SERVER - A web server is a computer or a group of computers
that hosts or stores content of website. Examples – Apache Tomcat , IIS etc.

Web 2.0 - Web 2.0 refers to new generation of dynamic and interactive websites.

HTML (Hyper Text Markup Language)	**XML**(eXtensible Markup Language)
HTML is used to display the data, text and images of a webpage on web browser and focus is on the format of data displayed.	XML is used to describe the data and focus is on the content of the data. XML is recommended by the World Wide Web Consortium (W3C). It is a free open standard.
HTML tags are predefined	XML tags are not predefined. We can create our own tags. XML code can also contain HTML tags.
HTML tags are not case sensitive. Example - <HTML> or <html> are the same	XML tags are case-sensitive

URL – stands for Uniform Resource Locator - It is a unique address or path for each resource located on the web. Every page on the web has a unique URL. Examples are: https://www.mhrd.gov.in , http://www.ncert.nic.in , http://www.airindia.in etc.
The most general form of a URL syntax is as follows:
Protocol:// <domain name> / <directory path>/<object name>
For example - https://www.ncert.nic.in/textbook/textbook.htm

DNS - Domain Name System / Domain Name Resolution - when the user types a domain name, the domain names are translated into Internet Protocol (IP) addresses. The computers or machines,access websites based on IP addresses.

Difference between MAC Address and IP Address -

Key	MAC Address	IP Address
Definition	MAC Address stands for Media Access Control Address.	IP Address stands for Internet Protocol Address.
Usage	MAC Address ensure that physical address of the computer is unique.	IP Address is a logical address of the computer and is used to uniquely locate computer connected via a network.
Format	MAC Address is of six byte hexadecimal address.	IP Address is of 4 bytes or of 16 bytes.
Access Protocol	MAC Address can be retrieved using ARP protocol.	IP Address can be retrieved using RARP protocol.
Provider	Chip maker manufacturer provides the MAC Address.	Internet Service Provider, ISP provides the IP Address.

- ## TIPS TO SOLVE CASE STUDY BASED QUESTIONS -

Tips for CASE STUDY BASED questions

Question	Hint for Answering
Layout	Draw block diagram interconnecting blocks, prefer the block or unit with maximum devices as main to connect other blocks
Topology	Write name of topology – Star / Bus / Ring etc.
Placement of Server	In the unit/block with maximum number of computers
Placement of Hub/Switch	In every block / unit
Placement of Repeater	As per layout diagram, if distance between two blocks is above 100 meter
Cost-effective medium for internet	Broadband / connection over telephone lines
Communication media for LAN	Ethernet (upto 100 meter) / Co-axial cable for high speed within LAN
Cost/Budget NOT an issue in LAN	Optical Fiber
Communication media for Hills	Radio wave / Microwave
Communication media for Desert	Radio wave
Very fast communication between two cities / countries	Satellite (avoid it in case economical / budget is mentioned)
Device / software to prevent unauthorized access	Firewall (Hardware and/or Software)

QUESTION BANK

SECTION –A (MULTIPLE CHOICE QUESTIONS)

1. Which of the following is a collection of independent computers and other hardware interconnected by communication channels?

(a) Computer (b) Networking

(c) Sharing (d) None of these

2. Which of the following is an advantage of networking?

(a) Application sharing (b) File sharing

(c) User communication (d) All of these

3. Geometric arrangement of devices on the network is called

(a) topology (b) protocols

(c) media (d) LAN

4. Modulation and demodulation is performed by

(a) microwave (b) satellite

(c) modem (d) gateway

5. Network formed between computers which are spread across the continents is called

(a) LAN (b) WAN (c) MAN (d) WLAN

6. If all devices are connected to a central hub, then topology is called

(a) bus topology (b) ring topology

(c) star topology (d) tree topology

7. ..... network device is known as an intelligent hub.

(a) Switch (b) Hub

(c) Router (d) Gateway

8. The WWW is made up of the set of interconnected

…… that are linked together over the Internet.

(a) electronic documents (b) web pages

(c) files (d) All of these

9. Which of the following topology contains a backbone cable running through the whole length of the network?

(a) Star (b) Bus (c) Mesh (d) Tree

10. A website is a collection of

(a) web server (b) web page

(c) web browser (d) WWW

11. Home page helps viewers to find out what they can find on the particular site. Home page is the

(a) first page of a website(b) index page

(c) about page (d) None of these

12. Which is the name of the network topology in which there are bi-directional links between each possible node?

(a) Ring (b) Mesh

(c) Tree (d) None of these

13. Computer connected to a star topology fails, the entire network will

(a) also fail (b) work unaffectedly

(c) only server will work (d) None of these

14. Which of the following statement(s) is/are true about URL?

(a) URL stands for Uniform Resource Locator.

(b) You can enter URL into address bar.

(c) Both (a) and (b)

(d) It is not necessary for URL to be unique.

15. In specific, if systems use separate protocols, which one of the following devices is used to link two systems?

(a) Repeater (b) Gateway

(c) Bridge (d) Hub

16. Web page is created using language

(a) XML (b) Java (c) C (d) HTML

17. A browser is a program, which is used to

(a) connect to Internet (b) create websites (c) view sites on web (d) All of the above

18. By default, web pages are saved in the …… folder.

(a) Download (b) Document (c) Picture (d) Music

19. A computer network:

(a) Is a collection of hardware components and computers

(b) Is interconnected by communication channels

(c) Allows sharing of resources and information

(d) All of the above

20. What is the use of Bridge in the network?

(a) To connect LANs

(b) To separate LANs

(c) To control network speed

(d) All of the above

21. Which of these is not a communication channel?

(a) Satellite

(b) Microwave

(c) Radio wave

(d) Wi-Fi

22. MAN Stands for _____.

(a) Metropolitan Area Network (b) Main Area Network

(c) Metropolitan Access Network (d) Metro Access Network

23. Which of these is not an example of unguided media?

(a) Optical Fibre Cable (b) Radio wave (c) Bluetooth (d) Satellite

24.In which topology are all the nodes connected through a single Coaxial cable?

(a) Star (b) Tree (c) Bus (d) Ring

25.Which protocol is used for the transfer of hypertext content over the web?

(a) HTML (b) HTTP (c) TCP/IP (d) FTP

26. Central Computer which is powerful than other computers in the network is called as _____.

(a) Client (b) Server (c) Hub (d) Switch

27. In peer-to-peer network, each computer in a network is referred as

(a) server (b) client (c) peer (d) sender

28. Which transmission media is capable of having a much higher bandwidth (data capacity)?

(a) Coaxial (b) Twisted pair cable (c) Untwisted cable (d) Fiber optic

29. A device that forwards data packet from one network to another is called a

(a) Bridge (b) Router (c) Hub (d) Gateway

30.Hub is a

(a) Broadcast device (b) Uni-cast device (c) Multi-cast device (d) None of the above

31. Which of the following is not a type of cloud?

(a) Private (b) Public (c) Protected (d) Hybrid

32. In computer, converting a digital signal in to an analog signal is called

(a) modulation (b) demodulation (c) conversion (d) transformation

33. What is the address size of IPv4?

(a) 32 bit (b) 64 bit (c) 128 bit (d) 256 bit

34. What are two advantages of using fiber-optic cabling instead of UTP ? (Choose two.)

(a) lower cost (b) easier to install (c) allows longer distances (d) less effected by external signals

35.Which network topology requires a central controller or hub ?

(a) Star (b) Bus (c) Mesh (d) Tree

36. A web-site is a collection of

(a) HTML documents (b) Graphic files (c) audio and video files (d) all the above

37. Which of the following is not a unit for data transfer rate ?

(a)bps (b)abps (c)gbps (d) kbps

38. Fill in the blank:

_____is a communication methodology designed to deliver both voice and multimedia communications over Internet protocol.

(a) VoIP (b) SMTP (c) PPP (d)HTTP

39. In which of the topology, network components are connected to the same cable?

(a)Star (b) Ring (c) Bus (d) Mesh

40. Network formed between computers which are spread across the continents is called

(a) LAN (b) WAN (c) MAN (d) WLAN

Solution -MULTIPLE CHOICE QUESTIONS

Ans1 . (b)

Ans 2. (d)

Ans 3. (a)

Ans.4 (c)

Ans. 5 (b)

Ans.6 (c)

Ans.7 (a)

Ans.8 (b)

Ans. 9 (b)

Ans.10 (b)

Ans. 11(a)

Ans. 12 (b)

Ans. 13 (b)

Ans. 14 (c)

Ans. 15 (b)

Ans. 16 (d)

Ans.17 (d)

Ans.18 (b)

Ans 19. (d)

Ans 20 (a)

Ans 21. (d)

Ans 22. (a)

Ans 23. (a)

Ans 24. (c)

Ans 25. (b)

Ans 26. (b)

Ans 27. (c)

Ans 28. (d)

Ans 29. (b)

Ans 30. (a)

Ans 31. (c)

Ans 32. (a)

Ans 33. (a)

Ans 34. (c,d)

Ans 35. (a)

Ans 36. (d)

Ans 37. (b)

Ans 38. (a)

Ans 39. (c)

Ans 40. (c)

Section B- ASSERTION AND REASONING

This section has ASSERTION AND REASONING based questions. Mark the correct choice as

(a) Both A and R are true and R is the correct explanation for A

(b) Both A and R are true and R is not the correct explanation for A

(c) A is True but R is False

(d) A is false but R is True

Q 1 Assertion - Switch is intelligent than Hub

Reason - Switch broadcast the signals and Hub unicast it.

Q 2 - Assertion - In circuit switching generally wastage of bandwidth happen more as compared to packet switching.

Reason - As in packet switching, packets can travel through different paths but in circuit switching all packets travel through same path.

Q 3 Assertion - Cookies help to load website faster on next visit.

Reason - Cookies are small files which store website related data.

Q4.- Assertion - VoIP stands for Voice Over Internet Protocol.

Reason:- It is a technology that allows you to make voice calls using a broadband internet connection instead of a regular phone line.

Q5:- Assertion:- Static webpage contains content that do not change

Reasoning:- They may only change if the actual HTML file is manually edited.

Q6. Assertion:- The internet is the world wide system of computer networks.

Reasoning:-All computers on the internet communicate with each other using POP/IMAP protocol which is the basic protocol of Internet.

Q7. Assertion:- Browser is the software to access internet based webpages in the computer.

Reasoning:-LAN Is a network where two or more computers are connected within few Kms.

Answers (ASSERTION BASED QUESTIONS):-

1. C

2. A

3. A

4. A

5. A

7. B

SECTION- C VERY SHORT ANSWERS QUESTIONS

Q1. Name an open source web browser.

Ans 1. Moxila Firefox

Q2. NAme any two common web browswers.

Ans 2. Google Chrome, Internet Explorer.

Q3. Write any one disadvnatges of VoIP

Ans:- The disadvantage of VoIP is that the call quality is dependent on the internet speed.

Q4. Give two examples of Instant messengers.

Ans:- Whatsapp, Skype, Facebook messenger etc.

Q5.Identify the following devices

(i) An intelligent device that connects several nodes to form a network and redirects the received information only to intended node(s).

(ii) A device that regenerates (amplifies) the received signal and re-transmits it to its destinations.

Ans. (i) Switch (ii) Repeater

Q6. Give two names of email Service Provider.

Ams:-Two Email Service providers are:- Google/ Yahoo

Q7:- Aman wants to connect 5 computers located at different locations in school.NAme the network formed in school

Ans:- LAN

Q8. NAme the largest WAN that connects billions of computers/smartphones .

Ans:- Internet.

Q9.Cable TV Network is an example of .....

Ans :- MAN.

Q10.Full form of MODEM is .....

Ans: Modulator/ De-Modulator.

Q11. Which protocol is used to creating a connection with a remote machine?

Ans:- Telnet

Q12.Expand the following: GSM / GPRS

Ans:

GSM: Global System for Mobile Commu-nication.

GPRS: General Packet Radio Service.

Q13:-Which type of network (out of LAN, PAN and MAN) is formed, when you connect two mobiles using Bluetooth to transfer a video?

Ans: PAN

Q14. Identify the type of topology from the following:

a)Each node is connected with the help of a single cable

b)Each node is connected with the help of independent cable with central switching.

Ans:

a)Bus topology

b)Star topology

Q15:- Manu wants to transfer data within a city at very high speed. Write the wired transmission medium and type of network.

Ans: Wired transmission medium – Optical fibre cable Type of network – MAN.

Q16. Which protocol helps us to transfer files to and from a remote computer ?

Ans:- FTP/ Telnet.

SECTION- D SHORT ANSWER QUESTIONS

Q1. Define Network. Give example related to daily life.

Ans Computer networking refers to interconnected computing devices that can exchange data and share resources with each other. These networked devices use a system of rules, called communications protocols, to transmit information over physical or wireless technologies.

Example from daily life:- Social network/ mobile network.

.

Q2. Write two advantgaes of of computer network.

Ans. Some of the benefits of networking are

(i) File sharing

(ii) Hardware sharing

(iii) Application sharing

(iv) User communication

(v) Access to remote database

Q3. Name different types of network based on geographical area.

Ans PAN/LAN/MAN/WAN

Q4. Write two differences between LAN/MAN/WAN.

Q5. What are cookies.

Ans:- Cookies are small pieces of text sent to your browser by a website you visit. They help that website remember information about your visit, which can both make it easier to visit the site again and make the site more useful to you.

Q6. Write a short note on Web Hosting.

Ans: Hosting (also known as Web site hosting, Web hosting, and Webhosting) is the business of housing, serving, and maintaining files for one or more Web sites. More important than the computer space that is provided for Web site files is the fast connection to the Internet.

Q7. Define Browser. Give two examples.

Ans: A browser is software that accesses and displays pages and files on the web. Browsers require a connection to the Internet (e.g., through a cable modem, a direct Ethernet connection, or Wi-Fi). Popular web browsers include Firefox, Internet Explorer, and Safari

Q8.What is the difference between message switching and packet switching?

Ans. In message switching, data packets are stored on the disk while in packet switching, all the packets of fixed size are stored in main memory making it more efficient as compared to other switching techniques.

Q9. Differentiate between the terms Internet and Intranet.

Ans. Differences between Internet and Intranet are as follows

Internet Intranet

Access by an individual with dial-up access.
Information on Internet could be general, public and advertisement.

Access by only authorised employees.
Information on Intranet could be specific, corporate and proprietary.

Q10. Write one advantage and one disadvantage of using optical fibre cable.

Ans. Advantage of using optical fibre cable It is immune to electrical and magnetic interference, i.e. the data does not get disturbed and pure data is retrieved on the other end.

Disadvantage of using optical fibre cable Connecting either two fibres together or a light source to a fibre is a difficult process.

Q11.Write the difference between LAN and MAN.

LAN stands for Local Area Network

LAN's ownership is private

MAN stands for Metropolitan Area Network.

MAN's ownership can be private or public.

The speed of LAN is high.

The speed of MAN is average.

Q12. What is the difference between star topology and bus topology of network?

Ans. Differences between star topology and bus topology are as follows :

Star Topology Bus Topology

All the nodes are directly connected with the central node or server.

There is a single length of transmission medium on which various nodes are attached and the server can be anywhere in the transmission cable.

Easy to detect faults.

Faults cannot be easily detected.

It is fast in transmission

Becomes slow with increase in node.

Q13.Define tree topology. Also, write down its two limitations.

Ans. A tree topology is an extension and variation of bus topology. Its basic structure is like an inverted tree, where the root acts as a server.

Limitations

- Long cables are required for this kind of topologies.

- There is the dependence on the root node

Q14. What is protocol? Which protocol is used to copy a file from/to a remote server?

Ans. Protocol is a set of rules that two or more computers must follow to communication on network. FTP (File Transfer Protocol) is used to copy a file from/to a remotely located server.

Q15. What is Electronic Mail ? Give example of Email.

Ans:- The definition of an e-mail is a message sent from one computer to another over the Internet, using a set webmail server address. An example of an e-mail is a happy birthday message a person sends from their Yahoo account to their mom at her Gmail account.

Q16:-Define hub and write its functions and types.

Ans. A hub connects several computers together and acts as a central node or server.

Function of a hub

- Interconnects number of computers or users.
- All the incoming data packets received by the hub are send to all hub ports and from their, the data is sent to all the computers, connected in a hub network.

Hub are of two types

(i) Active hub It acts as repeater. It amplifies the signal as these move from one device to another.

(ii) Passive hub It simply passes the signal from one connected device to another.

Q17:- Distinguish between website and web browser.

Ans. Website is a place on the net servers to keep web pages.

Web browser is a software application for retrieving, presenting and traversing information on the world wide web.

Q18:- Differentiate between XML and HTML.

Ans. XML was designed to describe data and to focus on what data is. HTML was designed to display data and to focus on how data looks.

HTML is about displaying information while XML is about describing information.

Q19:- What is the difference between domain name and IP address?

Ans. IP address is an identifier for a computer or device on a TCP/IP network.

e.g. 1.160.10.240 could be an IP address.

A domain name is a name that identifies one or more IP addresses.

e.g. The domain name microsoft.com represents about a dozen IP addresses.

Q20:-Write two characterstics of Wi-Fi.

Answer: It is wireless network.

It is for short range.

Q21.What is cloud computing?

Ans:

The sharing of compute resources (dedicated, time-shared, or dynamically shared servers) and related infrastructure components (load balncers, firewalls, network storage, developer tools, monitors and management tools) to facilitate the deployment and operation of web and network based applications. Cloud computing relies on sharing of resources to achieve coherence and economies of scale, similar to a utility (like the electricity grid) over a net-work.

Q22: What are repeaters?

Ans: A repeater is an electronic device that receives a signal and retransmits it at a higher level and/ or higher power, or onto the other side of an obstruction, so that the signal can cover longer distances.

Q23. Differentiate between packet switching and message switching technique in network communication.

Answer:

In packet switched network, data are transmitted in discrete units of potentially variable length blocks called packets, while in message switching mechanism, a node receives a message stores it until the appropriate route is free, then sends it along.

SECTION-E LONG ANSWER QUESTIONS (CASE STUDY/ CCT BASED QUESTIONS)

Q1. Be Happy Corporation has set up its new centre at Noida, Uttar Pradesh for its office and web-based activities. It has 4 blocks of buildings.

The distance between the various blocks is as follows:

A to B -40m

B to C - 120 m

C to D - 100m

A to D - 170 m

B to D - 150m

A to C - 70m

Numbers of computers in each block

Block A 25

Block B 50

Block C 125

Block D 10

(a) Suggest and draw the cable layout to efficiently connect various blocks of buildings within the Noida centre for connecting the digital devices.

(b) Suggest the placement of the following device with justification

(i) Repeater : between C and D as the distance between them is 100 mts

(ii)Hub/ Switch : in each block as they help to share data packets within the devices of the network in each block

(c) Which kind of network (PAN/LAN/WAN) will be formed if the Noida office is connected to its head office in Mumbai?

Ans: WAN

(d) Which fast and very effective wireless transmission medium should preferably be used to connect the head office at Mumbai with the centre at Noida?

Ans: Satellite

Q2. In the mid-'80s another federal agency, the NSF created a new high capacity network called NSFnet, which was more capable than ARPANET.

The only drawback of NSFnet was that it allowed only academic research on its network and not any kind of private business on it.

Now, several private organisations and people started working to build their own networks, named private networks, which were later (in the 1990s) connected with ARPANET and NSFnet to form the Internet. The Internet really became popular in the 1990s after the development of the World Wide Web.

i) What does NSFnet stand for?

National Senior Foundation Network

National Science Framework Network

National Science Foundation Network

National Science Formation Network

Ans. c

ii) What does ARPANET stand for?

Advanced Research Premium Agency NETwork

Advanced Research Projects Agency NETwork

Advanced Review Projects Agency NETwork

Advanced Research Protection Agency NETwork

Ans. b

iii) What is internet?

A single network

A vast collection of different networks

Interconnection of local area networks

Interconnection of wide area networks

Ans. b

iv) To join the internet, the computer has to be connected to a _____

Internet architecture board

Internet society

Internet service provider

Different computer

Ans. c

v) Internet access by transmitting digital data over the wires of a local telephone network is provided by:

Leased line

Digital subscriber line

Digital signal line

Digital leased line

Ans. b

vi) A piece of icon or image on a web page associated with another webpage is called _____

URL

Hyperlink

Plugin

Extension

Ans. b

Q3. Web server is a special computer system running on HTTP through web pages. The web page is a medium to carry data from one computer system to another. The working of the web server starts from the client or user. The client sends their request through the web browser to the web server. Web server takes this request, processes it and then sends back processed data to the client. The server gathers all of our web page information and sends it to the user, which we see on our computer system in the form of a web page. When the client sends a request for processing to the web server, a domain name and IP address are important to the web server. The domain name and IP address are used to identify the user on a large network.

(i) Web servers are

(a) IP addresses

(b) computer systems

(c) web pages of a site

(d) a medium to carry data from one computer to another

Ans:- (b)

(ii) What does the web server need to send back information to the user?

(a) Home address

(b) Domain name

(c) IP address

(d) Both (b) and (c)

Ans:- (d)

(iii) What is the full form of HTTP?

(a) HyperText Transfer Protocol

(b) HyperText Transfer Procedure

(c) Hyperlink Transfer Protocol

(d) Hyperlink Transfer Procedure

Ans :- (a)

(iv) The …… translates Internet domain and host names to IP address.

(a) domain name system

(b) routing information protocol

(c) Internet relay chart

(d) network time protocol

Ans :- (a)

(v) Computer that requests the resources or data from another computer is called as …… .

(a) server

(b) client

(c) Both (a) and (b)

(d) None of the above

ANs:- (b)

Q4. Hindustan Connecting World Association" is planning to start their offices in four major cities in India to provide regional IT infrastructure support in the field of Education & Culture. The company has planned to set up their head office in New Delhi in three locations and have named their New Delhi offices as "Sales Office", "Head Office" and "Tech Office". The company's regional offices are located at "Coimbatore", "Kolkata" and "Ahmedabad". A rough layout of the same is as follows:

Approximate distances between these offices as per the network survey team is as follows:

Place From Place To Distance

Head Office Sales Office- 10 KM

Head Office Tech Office- 70 Meter

Head Office Kolkata Office- 1291 KM

Head Office Ahmedabad Office- 790 KM

Head Office Coimbatore Office- 1952 KM

In continuation of the above, the company experts have planned to install the following number of computers in each of their offices:

Head Office- 100
Sales Office- 20
Tech Office - 50
Kolkata Office- 50
Ahmedabad Office- 50
Coimbatore Office- 50

1. Suggest network type (out of LAN, MAN, WAN) for connecting each of the following set of their offices: - Head Office and Tech Office - Head Office and Coimbatore Office

Ans 1:- WAN

2. Which device will you suggest to be procured by the company for connecting all the computers within each of their offices out of the following devices? - Modem - Telephone - Switch/ Hub

Ans 2:- Switch/Hub

3. Which of the following communication media, will you suggest to be procured by the company for connecting their local offices in New Delhi for very effective and fast communication? -

Ethernet Cable - Optical Fiber - Telephone Cable

Ans 3: Optical Fibre.

4. Suggest a cable/ wiring layout for connecting the company's local offices located in New Delhi.

Ans 4:- Bus/Star

5. The organization is planning to link its front office situated in the city in the hilly region where cable connection is not feasible, so, suggest an economic way to connect it with reasonably high speed.

Ans 5:- Radiowave.

Q5:-Mr. GopiNath Associate Manager of Unit Nations corporate recently discovered that the communication between his company's accounts office and HR office is extremely slow and signals drop quite frequently. These offices are 120 metre away from each other and connected by an Ethernet cable.

(i) Suggest him a device which can be installed in between the office for smooth communication.

(ii) What type of network is formed by having this kind of connectivity out of LAN, MAN and WAN?

Ans. (i) The device that can be installed between the office for smooth communication is repeater.

(ii) The type of network is Local Area Network (LAN).

Q6:- Samarth is the harware engineer of "Happy School". He has been given the task of installing a

network in the school lab which has around 40 computers.

i). Suggest the most suitable type of network topology he should use in order to maximise speed and

make each computer indepenent of network breakdowns.

a. Bus Topology

b. Star Topology

c. Ring Topology

d. Mesh Topology

Ans : b

ii). In order to allow data transfer from server to only the intended computers which network device

is required in the lab to connect the computers?

a. Switch b. Hub c. Router d. Gateway

Ans : a

iii). After setting up the lab and internet in the lab, Samarth is now required to enable videos and

animations to be played on the web browser for students of multimedia class. Which browser tool /service can be used for the same?

a. Plug ins b. Add ons c. Control Panel d. Download Settings

Ans:- b

iv). During an international exchange programme the students need to connect to a classroom in Russia using Skype. Samarth helps the students to connect. Which type of network service is being used ?

a. Instant messaging b. Email messaging c. VoIP d. WWW

Ans: c

Q 7 Ramanpreet has to work on his science project which deals with electromagnetic waves. A lot of research workis required by him for the same. He uses Google Chrome to search for the relevant matter.

i). Google chromeis an example of a

a. Website
b. Web browser
c. Web Page
d. Web Page
Ans. (b)

ii). He finally locates some useful information and clicks on the link provided to access the website. The

link is actually known as a_____.

a. Domain name
b. Web Page
c. URL
d. IP address
Ans. (c)

iii). As Ramanpreet works on his project, he collects and curates information. Whenever he clicks on the link the same piece of information is shown and the content is not clickable. Ramanpreet is accessing a/an _____ website.

a. Dynamic
b. Textual
c. Outdated
d. Static
Ans. (d)

iv). A web cookie is a small piece of data that is _____

a. sent from a website and stored in user's web browser while a user is browsing a website
b. sent from user and stored in the server while a user is browsing a website
c. sent from root server to all servers
d. sent from the root server to other root servers
Ans. (a)

v). HTML stands for_____

a. Hyper Text Markup Link
b. Hyper Text Markup Language
c. Hybrid Text Markup Language
d. Hyper Text Manipulation Language

Ans. (c)

Q8:- Case Study :

Web server is a special computer system running on HTTP through web pages. The web page is a medium to carry data from one computer system to another. The working of the webserver starts from the client or user. The client sends their request through the web browser to the webserver. Web server takes this request, processes it and then sends back processed data to the client. The server gathers all of our web page information and sends it to the user, which we see on our computer system in the form of a web page. When the client sends a request for processing to the web server, a domain name and IP address are important to the webserver. The domain name and IP address are used to identify the user on a large network.

i) Web servers are:
IP addresses

Computer systems

Webpages of a site

A medium to carry data from one computer to another

Ans. b

ii) What does the webserver need to send back information to the user?
Home address

Domain name

IP address

Both b and c

Ans. d

iii) What is the full form of HTTP?

Hypertext Transfer Protocol
Hypertext Transfer Procedure
Hyperlink Transfer Protocol
Hyperlink Transfer Procedure

Ans. a

iv) The _____ translates internet domain and host names to IP address

Domain name system
Routing information protocol
Google
Network time protocol

Ans. a

v) Computer that requests the resources/data from othercomputer is called ____ computer.

Server
Client
None of the above
a and b

ans. b

vi) DNS stands for:

Domain Name Security
Domain Number System
Document Name System
Domain Name System

Ans. d

vii)What is the format of IP address?

34 bit
32 bit
16 bit
64 bit

Ans. b

Q9:- TCP/IP, or the Transmission Control Protocol/Internet Protocol, is a suite of communication protocols used to interconnect network devices on the internet. TCP/IP can also be used as a communications protocol in a private computer network (an intranet or an extranet).TCP defines how applications can create channels of communication across a network. It also manages how a message is assembled into smaller packets before they are then transmitted over the internet and reassembled in the right order at the destination address.

IP defines how to address and route each packet to make sure it reaches the right destination. Each gateway computer on the network checks this IP address to determine where to forward the message. TCP/IP uses the client-server model of communication in which a user or machine (a client) is provided a service (like sending a webpage) by another computer (a server) in the network. Collectively, the TCP/IP suite of protocols is classified as stateless, which means each client request is considered new because it is unrelated to previous requests. Being stateless frees up network paths so they can be used continuously.

i)Which of the following protocols is used in the internet?

HTTP
DHCP
DNS
All of the above

Ans. d

ii)Which one of the following is not an application layer protocol used in internet?

Remote procedure call
Internet relay chat
Resource reservation protocol
Local procedure call

Ans. c

iii) Which protocol assigns IP address to the client connected to the internet?

DHCP
IP
RPC
RSVP

Ans. a

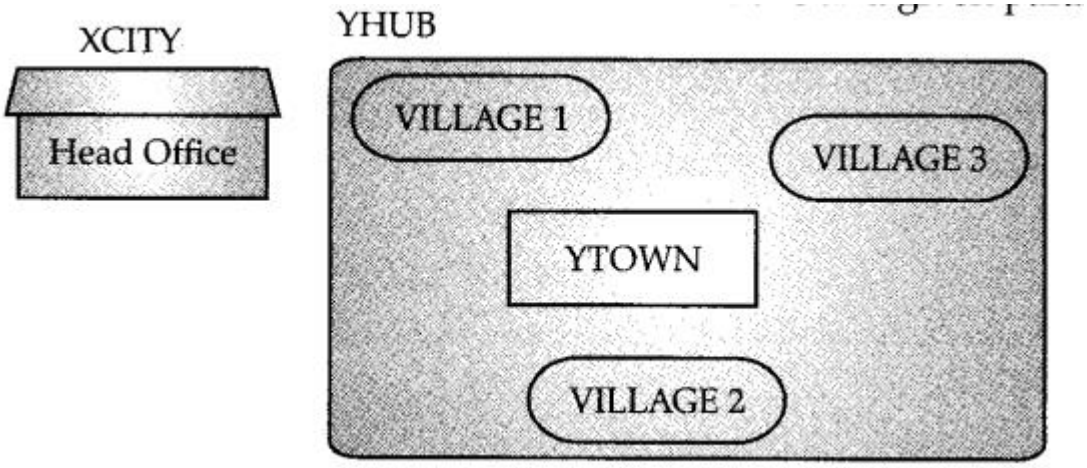
iv) Internet protocols are a set of rules to govern communication between

computers on a network
standard
metropolitan communication
bandwidth

Ans. A

Q10.)Intelligent Hub India is a knowledge community aimed to uplift the standard of skills and knowledge in the society. It is planning to setup its training centres in multiple towns and villages pan India with its head offices in

the nearest cities. They have created a model of their network with a city, a town and 3 villages as given.
As a network consultant, you have to suggest the best network related solution for their issues/problems raised in (i) to (iv) keeping in mind the distance between various locations and given parameters.



Shortest distance between various locations:-

VILLAGE 1 To YTOWN	2 KM
VILLAGE 2 To YTOWN	1.2 KM
VILLAGE 3 To YTOWN	3 KM
VILLAGE 1 To VILLAGE 2	3.5 KM
VILLAGE 1 To VILLAGE 3	4.5 KM
VILLAGE 2 To VILLAGE 3	3.5 KM
CITY Head office to YHUB	30 KM

Number of computers iinstalled at various locations are as follows:

YTOWN	100
VILLAGE 1	10
VILLAGE 2	15
VILLAGE 3	15
CITY OFFICE	5

• In Villages, there are community centres, in which one room has been given as training center to this organiza¬tion to install computers.
• The organization has got financial support from the government and top IT companies.

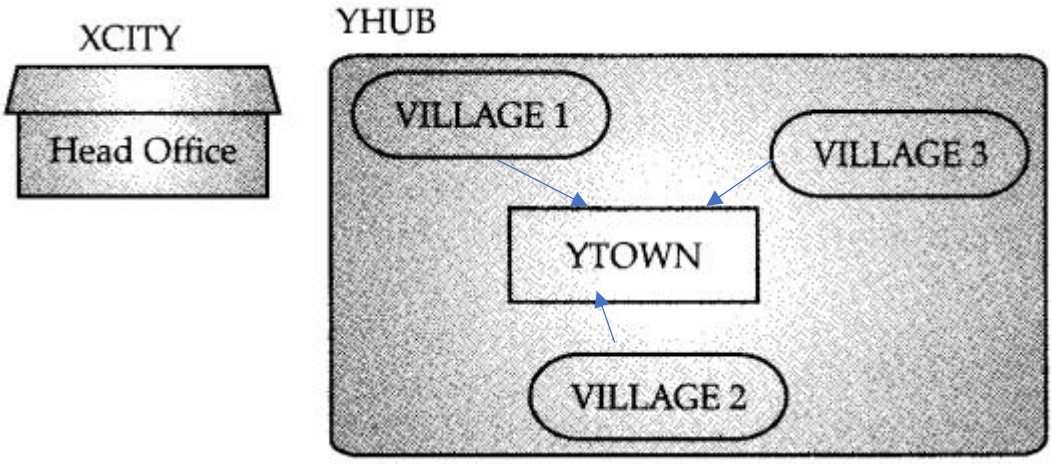
1. Suggest the most appropriate location of the SERVER in the YHUB (out of the 4 locations), to get the best and effective connectivity. Justify your answer.
2. Suggest the best wired medium and draw the cable layout (location to location) to efficiently connect vari¬ous locations within the YHUB.

3. Which hardware device will you suggest to connect all the computers within each location of YHUB?
4. Which server/protocol will be most helpful to conduct live interaction of Experts from Head office and people at YHUB locations?

Ans:- (i) YTOWN
Justification

1. Since it has the maximum number of computers.
2. It is closet to all other locatios.

(ii) Optical Fiber. Star topology



(iii) Switch or Hub
(iv) Video conferencing or VoIP or any other correct service/protocol.

Q11. Vidya Senior Secondary Public School in Nainital is setting up the network between its different wings. There are 4 wings named as SENIOR(S), JUNIOR(J), ADMIN(A) and HOSTEL(H).

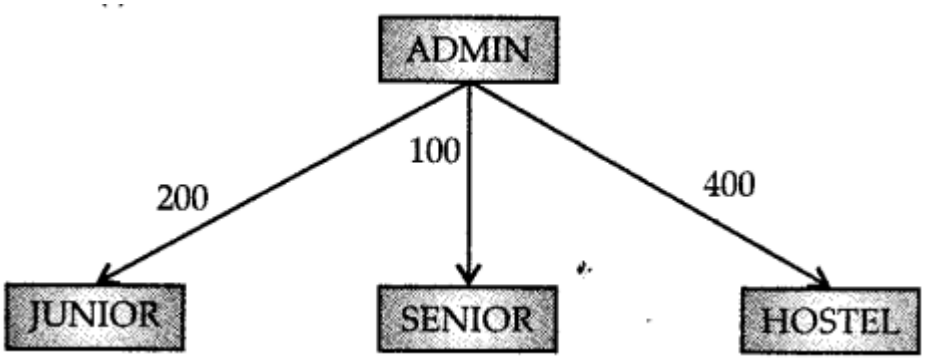
Distance between various wings are given below:

Wing A to Wing S	100 m
Wing A to Wing J	200 m
Wing A to Wing H	400 m
Wing S to Wing J	300 m
Wing S to Wing H	100 m
Wing J to Wing H	450 m

Wing	Number of Computers
Wing A	20
Wing S	150
Wing J	50
Wing H	25

1. Suggest a suitable Topology for networking the computers of all wings.
2. Name the most suitable wing where the Server should be installed. Justify your answer.
3. Suggest where all should Hub(s)/Switch(es) be placed in the network.
4. Which communication medium would you suggest to connect this school with its main branch in Delhi ?

Ans:- 1.



1. Server should be in Wing S as it has the maxi-mum number of computers. 1
2. All Wings need hub/switch as it has more than one computer.
3. Since the distance is more, wireless transmission would be better. Radiowaves are reliable and can travel through obstacles.

Contributed By:-

1. **Mrs Pooja Gup[ta, PGT(CS), KV Jhagrakahnd.**
2. **Mr. Ravi Kumar, PGT(CS), K V Baikunthpur.**

Unit III: Database Management

What is a Database?

Database is a systematic collection of data. Databases support storage and manipulation of data. Databases make data management easy. Let's discuss few examples.

WHY DO WE NEED DATABASE

Accuracy: *__Ease of updating data:__

Security of data: *__Data integrity:__.

Advantages of Database System

- **Databases reduce Redundancy**:. * **Database controls Inconsistency:**
- **Database facilitates** ***Sharing of Data**;
- **Database ensures Security:**. *__Database maintains Integrity:__
- **Database enforce standards:**

What is a Database Management System (DBMS)?

Database Management System (DBMS) is a collection of programs which enables its users to access database, manipulate data, reporting / representation of data.

What is Relational Model

The relational model represents the database as a collection of relations. A relation is nothing but a table of values. Every row in the table represents a collection of related data values. These rows in the table denote a real-world entity or relationship.

Relational Model Concepts

Attribute: Each column in a Table. Attributes are the properties which define a relation. e.g., Student_Rollno, NAME,etc.

Tables – In the Relational model the, relations are saved in the table format. It is stored along with its entities. A table has two properties rows and columns. Rows represent records and columns represent attributes.

Tuple – It is nothing but a single row of a table, which contains a single record.

Relation Schema: A relation schema represents the name of the relation with its attributes.

Degree: The total number of attributes which in the relation is called the degree of the relation.

Cardinality: Total number of rows present in the Table.

Column: The column represents the set of values for a specific attribute.

Relation key - Every row has one, two or multiple attributes, which is called relation key.

Attribute domain – Every attribute has some pre-defined value and scope which is known as attribute domain

Domain :It is a collection of values from which the value is derived for a column.

What is a Primary Key?

PRIMARY KEY is a column or group of columns in a table that uniquely identify every row in that table. The Primary Key can't be a duplicate meaning the same value can't appear more than once in the table. A table cannot have more than one primary key.

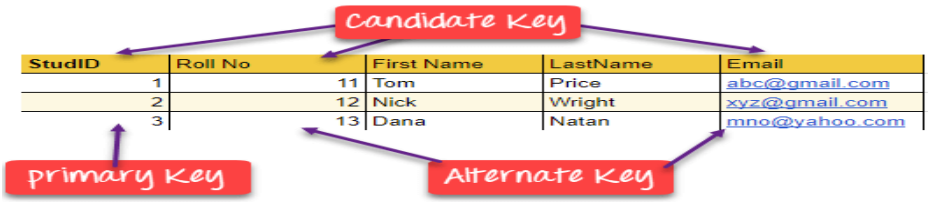
What is the Alternate key?

ALTERNATE KEYS is a column or group of columns in a table that uniquely identify every row in that table. A table can have multiple choices for a primary key but only one can be set as the primary key. All the keys which are not primary key are called an Alternate Key.

Example:

What is a Candidate Key?

CANDIDATE KEY is a set of attributes that uniquely identify tuples in a table. Candidate Key is a super key with no repeated attributes. The Primary key should be selected from the candidate keys. Every table must have at least a single candidate key. A table can have multiple candidate keys but only a single primary key.



What is the Foreign key?

FOREIGN KEY is a column that creates a relationship between two tables. The purpose of Foreign keys is to maintain data integrity and allow navigation between two different instances of an entity. It acts as a cross-reference between two tables as it references the primary key of another table.

SQL

SQL is an acronym of Structured Query Language. It is a standard language developed and used for accessing and modifying relational databases.
SQL is being used by many database management systems. Some of them are:
MySQL, PostgreSQL, Oracle, SQLite, Microsoft SQL Server

Data Definition Language

DDL commands are used for creating databases and tables. It contains necessary statements for creating, manipulating, altering and deleting tables.

1. CREATE (create database and table)
2. ALTER (alter table)
3. DROP (delete table)

Data Manipulation Language:

DML commands are used for manipulating Data.

1. SELECT (view data from table)
2. INSERT (insert data in table)
3. UPDATE (update data in table)
4. DELETE (delete data from table)

Data Types(MySQL):

INT( )	-2147483648 to 2147483647 normal 0 to 4294967295 UNSIGNED.
FLOAT	A small approximate number with a floating decimal point. Decimal hold upto 19 significant digit
NUMERIC(x,y)	Number stored in decimal format, allowing for a fixed decimal point. here 'x' is total number of digit and 'y' is number of decimal places Decimal hold upto 20 significant digit
CHAR(x)	A fixed 'x' number of characters upto 0 to 255 characters long.
VARCHAR(x)	A variable length 'x' characters upto 0 to 255 characters long. It will not leave unused space, it releases the unused memory space
DATE	YYYY-MM-DD

SQL commands:

Getting listings of databases;
mysql> SHOW DATABASES;

Creating a database-

mysql> CREATE database <databasename>;
mysql> CREATE database myschool;

Deleting a database

mysql> DROP database <databasename>;
mysql> DROP database myschool;
After we have created the database we use the USE statement to change the current
mysql> USE <database name>;
mysql> USE myschool;
Getting listings of tables in database (myschool)
mysql> SHOW TABLES;
The command DESCRIBE is used to view the structure of a table.
mysql> DESCRIBE <tablename>;
mysql> DESCRIBE student;

To remove a table (DROP)

mysql> drop table <tablename>;
mysql> drop table student;

Creating a table (CREATE)

Creating a table in the database is achieved with a CREATE table command.
mysql> CREATE TABLE student
(lastname varchar(15),
Firstname varchar(15),
city varchar(20),
class char(2));

Insert data in Table (INSERT)

To insert new rows into an existing table use the INSERT command:
mysql>INSERT INTO student values('dwivedi','freya','Udaipur','4');

View data from Table (SELECT)

With the SELECT command we can retrieve (or see) previously inserted rows:
mysql> SELECT * FROM student;

Conditions can be set with help of following operators:

Comparison operators are: **< ; <= ; = ; != or <> ; >= ; >**
Logical operators are: **AND ; OR ; NOT**
Comparison operator for special value NULL: **IS**
Selecting rows by using the **WHERE** clause in the SELECT command
mysql> SELECT * FROM student WHERE class="4";
Selecting specific columns(Projection) by listing their names
mysql> SELECT first_name, class FROM student;

Update data in Table (UPDATE)

To modify or update entries in the table use the UPDATE command
mysql> UPDATE student SET class="V" WHERE firstname="freya";
All columns will be updated with same value
mysql> UPDATE student SET class="V";

Delete data from Table

Deleting selected rows from a table using the DELETE commands
mysql> DELETE FROM student WHERE firstname="amar";

Eliminating Redundant Data: (with Keyword DISTINCT)

DISTINCT keyword eliminates duplicate rows from the result of a SELECT statement.
mysql> SELECT DISTINCT city FROM Student
mysql> SELECT DISTINCT city FROM Student WHERE class=4

BETWEEN - to access data in specified range

mysql> SELECT * FROM Student WHERE class between 4 and 6;

IN - operator allows us to easily test if the expression is in the list of values.

mysql> SELECT * FROM Student WHERE class in (4,5,6);

Pattern Matching – **LIKE** Operator

A string pattern can be used in SQL using the following wild card

1. % Represents a substring in any . 2. **_** Represents a single character

Example:

'A%' represents any string starting /with 'A' character. '_ _A' represents any 3 character string ending with 'A'. '_B%' represents any string having second character 'B'

'_ _ _' represents any 3 letter string. A pattern is case sensitive and can be used with LIKE operator.

Altering Table

The SQL **ALTER TABLE** command is used to **add, delete** or **modify** columns in an existing table

ALTER TABLE command is also used to add and drop various constraints on an existing table.

Syntax

ALTER TABLE command to add a New Column in an existing table is as follows.

ALTER TABLE table_name ADD column_name datatype;

ALTER TABLE employee

ADD (tel_number integer);

ALTER TABLE command to DROP COLUMN in an existing table is as follows.

ALTER TABLE table_name DROP COLUMN column_name;

ALTER TABLE employee

DROP grade;

ALTER TABLE command to change the DATA TYPE of a column in a table is as follows.

ALTER TABLE table_name MODIFY COLUMN column_name datatype;

ALTER TABLE employee

MODIFY(Job char(30));

ALTER TABLE command to change name of one column:

ALTER TABLE table_name CHANGE old_column new_column datatype;

ALTER TABLE employee

CHANGE First_Name FName varchar(30);

Ordering Query Result – **ORDER BY** Clause

A query result can be orders in ascending (A-Z) or descending (Z-A) order as per any column. Default is Ascending order.

mysql> SELECT * FROM Student ORDER BY class;

mysql> SELECT * FROM Student ORDER BY City;

To get descending order use DESC key word.

mysql> SELECT * FROM Student ORDER BY class DESC;

mysql> SELECT * FROM Student ORDER BY City DESC;

mysql> SELECT Name, Fname, City FROM Student

Where Name LIKE 'R%' ORDER BY Class;

GROUP BY:

Sometimes it is required to apply a Select query in a group of records instead of the whole table.

The GROUP BY clause combines all those records that have identical values in a particular field or a group of fields. This grouping results into one summary record per group.

We can group records by using GROUP BY <column> clause with Select command. A group column is chosen which has non-distinct (repeating) values like City, Job etc.

Lastname	Fname	City	Class
Sharma	Rajesh	Jaipur	12

Kumar	Kamal	Kota	12
Saxena	Rajeev	Kota	10
Singh	Rohit	Ajmer	10
Verma	Sachin	Jaipur	11

Example:

SELECT COUNT(class) FROM student GROUP BY city;

COUNT(class)

2

2

SELECT city, COUNT(*) FROM student GROUP BY city;

City	count(*)
Jaipur	2
Kota	2
Ajmer	1

The HAVING clause is used to restrict the results returned by the GROUP BY clause.

Aggregate Functions

Name	Purpose
SUM()	Returns the sum of the given column.
MIN()	Returns the minimum value in the given column.
MAX()	Returns the maximum value in the given column.
AVG()	Returns the Average value of the given column.
COUNT()	Returns the total number of values/ records as per given column.

Joins: equi-join and natural join

A join is a query that combines rows from two or more tables. In a JOIN query more than one table are listed in the FROM clause. MySQL provides various type of Joining :

CROSS JOIN or CARTESIAN PRODUCT

EQUI-JOIN (in Syllabus)

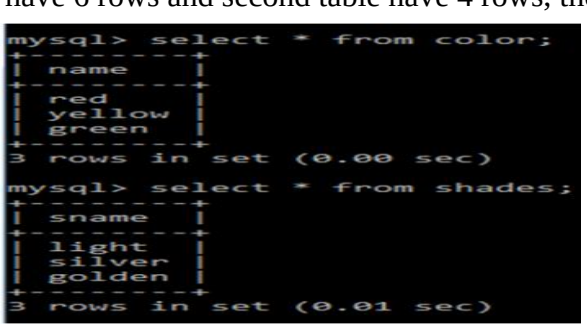
NATURAL JOIN (in Syllabus)

Cross Join (Cartesian product)

It return all possible concatenation of all rows from both table i.e. one row of First table is joined with all the rows of second table.

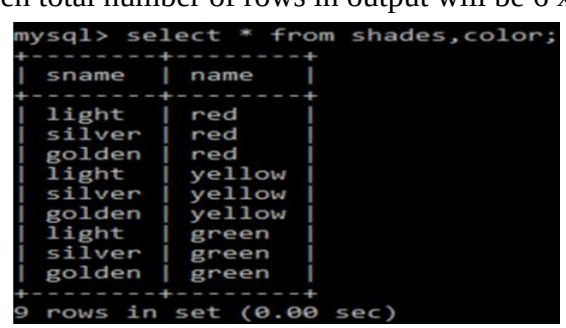
Cartesian product joins each row of one table with each row of another table. So if –

First table have 6 rows and second table have 4 rows, then total number of rows in output will be 6 x 4 = 24.



```
mysql> select * from color;
+---------+
| name    |
+---------+
| red     |
| yellow  |
| green   |
+---------+
3 rows in set (0.00 sec)

mysql> select * from shades;
+---------+
| sname   |
+---------+
| light   |
| silver  |
| golden  |
+---------+
3 rows in set (0.01 sec)
```



```
mysql> select * from shades,color;
+---------+---------+
| sname   | name    |
+---------+---------+
| light   | red     |
| silver  | red     |
| golden  | red     |
| light   | yellow  |
| silver  | yellow  |
| golden  | yellow  |
| light   | green   |
| silver  | green   |
| golden  | green   |
+---------+---------+
9 rows in set (0.00 sec)
```

s

EQUI-JOIN

The join, in which columns are compared for equality is called Equi-Join. A non-equi join specifies condition with non-equality operator. In equi-join we put (*) in the select list therefore the common column will appear twice in the output.

To understand the output, let's take 2 table one for employee (contains employee detail with deptno) and another for department contains deptno and other department details.

```
mysql> select * from emp;
+-------+---------+--------+--------+
| empno | ENAME   | DEPTNO | salary |
+-------+---------+--------+--------+
|     1 | alam    |     10 |  10300 |
|     2 | srijeeta|     20 |   6220 |
|     3 | bhaskar |     30 |  11320 |
|     4 | emely   |     10 |  20500 |
|     5 | freddy  |     30 |  11320 |
|     7 | chanop  |     10 |  51100 |
|     8 | akshay  |     20 |  30700 |
|     9 | manish  |     20 |  46000 |
|    10 | nitin   |     20 |  78100 |
|    11 | naveen  |     20 |   9000 |
|    12 | Kirti   |     20 |   9000 |
|    13 | Gabbar  |     30 |  12100 |
|    14 | sunny   |     20 |   NULL |
+-------+---------+--------+--------+
13 rows in set (0.03 sec)

mysql> select * from dept;
+--------+------------+---------+
| deptno | dname      | dhead   |
+--------+------------+---------+
|     10 | Sales      | Ritika  |
|     20 | HR         | Ankit   |
|     30 | Production | Abuzair |
|     40 | IT         | Mesha   |
+--------+------------+---------+
4 rows in set (0.00 sec)
```

```
mysql> select * from emp, dept where emp.deptno = dept.deptno;
+-------+---------+--------+--------+--------+------------+---------+
| empno | ENAME   | DEPTNO | salary | deptno | dname      | dhead   |
+-------+---------+--------+--------+--------+------------+---------+
|     1 | alam    |     10 |  10300 |     10 | Sales      | Ritika  |
|     2 | srijeeta|     20 |   6220 |     20 | HR         | Ankit   |
|     3 | bhaskar |     30 |  11320 |     30 | Production | Abuzair |
|     4 | emely   |     10 |  20500 |     10 | Sales      | Ritika  |
|     5 | freddy  |     30 |  11320 |     30 | Production | Abuzair |
|     7 | chanop  |     10 |  51100 |     10 | Sales      | Ritika  |
|     8 | akshay  |     20 |  30700 |     20 | HR         | Ankit   |
|     9 | manish  |     20 |  46000 |     20 | HR         | Ankit   |
|    10 | nitin   |     20 |  78100 |     20 | HR         | Ankit   |
|    11 | naveen  |     20 |   9000 |     20 | HR         | Ankit   |
|    12 | Kirti   |     20 |   9000 |     20 | HR         | Ankit   |
|    13 | Gabbar  |     30 |  12100 |     30 | Production | Abuzair |
|    14 | sunny   |     20 |   NULL |     20 | HR         | Ankit   |
+-------+---------+--------+--------+--------+------------+---------+
13 rows in set (0.02 sec)

mysql>
```

```
mysql> select * from emp e, dept d where e.deptno = d.deptno;
+-------+---------+--------+--------+--------+------------+---------+
| empno | ENAME   | DEPTNO | salary | deptno | dname      | dhead   |
+-------+---------+--------+--------+--------+------------+---------+
|     1 | alam    |     10 |  10300 |     10 | Sales      | Ritika  |
|     2 | srijeeta|     20 |   6220 |     20 | HR         | Ankit   |
|     3 | bhaskar |     30 |  11320 |     30 | Production | Abuzair |
|     4 | emely   |     10 |  20500 |     10 | Sales      | Ritika  |
|     5 | freddy  |     30 |  11320 |     30 | Production | Abuzair |
|     7 | chanop  |     10 |  51100 |     10 | Sales      | Ritika  |
|     8 | akshay  |     20 |  30700 |     20 | HR         | Ankit   |
|     9 | manish  |     20 |  46000 |     20 | HR         | Ankit   |
|    10 | nitin   |     20 |  78100 |     20 | HR         | Ankit   |
|    11 | naveen  |     20 |   9000 |     20 | HR         | Ankit   |
|    12 | Kirti   |     20 |   9000 |     20 | HR         | Ankit   |
|    13 | Gabbar  |     30 |  12100 |     30 | Production | Abuzair |
|    14 | sunny   |     20 |   NULL |     20 | HR         | Ankit   |
+-------+---------+--------+--------+--------+------------+---------+
13 rows in set (0.00 sec)

mysql>
```

Natural Join

The JOIN in which only one of the identical columns exists is called Natural Join. It is similar to Equi-join except that duplicate columns are eliminated in Natural join that would otherwise appear in Equi-Join.

In natural join we specify the names of column to fetch in place of (*) which is responsible for appearing common column twice in output.

```
mysql> select ename,salary,dhead from emp e,dept d where e.deptno=d.deptno;
+----------+--------+---------+
| ename    | salary | dhead   |
+----------+--------+---------+
| alam     |  10300 | Ritika  |
| srijeeta |   6220 | Ankit   |
| bhaskar  |  11320 | Abuzair |
| emely    |  20500 | Ritika  |
| freddy   |  11320 | Abuzair |
| chanop   |  51100 | Ritika  |
| akshay   |  30700 | Ankit   |
| manish   |  46000 | Ankit   |
| nitin    |  78100 | Ankit   |
| naveen   |   9000 | Ankit   |
| Kirti    |   9000 | Ankit   |
| Gabbar   |  12100 | Abuzair |
| sunny    |   NULL | Ankit   |
+----------+--------+---------+
13 rows in set (0.00 sec)
```

A common error while giving command :

```
mysql> select empno,ename,deptno,dname,dhead from emp,dept where
    -> emp.deptno=dept.deptno;
ERROR 1052 (23000): Column 'deptno' in field list is ambiguous
mysql>
```

The reason of this error is – the deptno exists in both the table, so in this case if we are selecting or using only deptno then it becomes ambiguous from which table this deptno will be selected

To resolve this error, just qualify the common column by table name as TableName.column name

```
mysql> select empno,ename,emp.deptno,dname,dhead from emp,dept where
    -> emp.deptno=dept.deptno;
+-------+----------+--------+------------+---------+
| empno | ename    | deptno | dname      | dhead   |
+-------+----------+--------+------------+---------+
|     1 | alam     |     10 | Sales      | Ritika  |
|     2 | srijeeta |     20 | HR         | Ankit   |
|     3 | bhaskar  |     30 | Production | Abuzair |
|     4 | emely    |     10 | Sales      | Ritika  |
|     5 | freddy   |     30 | Production | Abuzair |
|     7 | chanop   |     10 | Sales      | Ritika  |
|     8 | akshay   |     20 | HR         | Ankit   |
|     9 | manish   |     20 | HR         | Ankit   |
|    10 | nitin    |     20 | HR         | Ankit   |
|    11 | naveen   |     20 | HR         | Ankit   |
|    12 | Kirti    |     20 | HR         | Ankit   |
|    13 | Gabbar   |     30 | Production | Abuzair |
|    14 | sunny    |     20 | HR         | Ankit   |
+-------+----------+--------+------------+---------+
13 rows in set (0.00 sec)
```

Till now we have performed joining using traditional SQL method which is common to most of the RDBMS software now we will learn MySQL style of joining using **JOIN** clause. MySQL support various options with **JOIN**

Cartesian product using JOIN

Select * from shades JOIN color;

Or

Select * from shades CROSS JOIN color;

Equi – Join using JOIN

Select * from emp JOIN dept ON emp.deptno = dept.deptno;

Select * from emp JOIN dept ON emp.deptno = dept.deptno where salary>50000;

Natural – Join using JOIN

Select * from emp NATURAL JOIN dept

In NATURAL JOIN condition the join condition is not required it automatically joins based on the common column value.

OBJECTIVE TYPE QUESTIONS /MULTIPLE CHOICE QUESTIONS

1. The_____clause of SELECT query allows us to select only those rows in the results that satisfy a specified condition.
   (a) **Where** (b) from (c) having (d) like
2. Which of the following function is used to FIND the largest value from the given data in MYSQL?
   (a) **MAX ()** (b) MAXIMUM () (c) LARGEST () (c) BIG ()
3. The data types CHAR (n) and VARCHAR (n) are used to create_____and_____types of string/text fields in a database.
   (a) Fixed, equal (b) Equal, variable (c) **Fixed, variable** (d) Variable, equal
4. The term_____ is use to refer to a record in a table.
   (a) Attribute (**b) Tuple** (c) Row (d) Instance
5. A relational database consists of a collection of
   (a) **Tables** (b) Fields (c) Records (d) Keys
6. Which is the subset of SQL commands used to manipulate database structure including tables?
   (a) **Data Definition Language (DDL)** (b) Data Manipulation Language (DML)
   (c) Both (a) and (b) (d) None
7. The term_____is used to refer to a field in a table.
   (a) **Attribute** (b) Tuple (c) Row (d) Instance
8. Consider the following table namely employee:

Employee_id	Name	Salary
5001	Amit	60000

5009	Sumit	45000
5020	Arpit	70000

Which of the names will be displayed by the below given query?
SELECT name FROM employee WHERE employee_id>5009;
(a) Amit, Sumit (b) Sumit, Arpit (**c) Arpit** (d) Amit, Arpit

9. Consider the following query
SELECT name FROM stu WHERE subject LIKE '_____Computer Science';
Which one of the following has to be added into the blank spaces to select the subject which has Computer Science as its ending string?
(a) $ (b) _ (c) || **(d) %**

10. Consider following SQL statement. What type of statement is this?
SELECT * FROM employee
(a) **DML** (b) DDL (c) DCL (d) Integrity constraint

11. Which of the following function is not an aggregate function?
(a) **Round()** (b) Sum() (c) Count () (d) Avg ()

12. Pick the correct username used for logging in database (sql with Python).
(a) **root** (b) local (c) directory (d) host

13. Aggregate functions can be used in the select list or the_____clause of a select statement. They cannot be used in a_____clause.
(a) Where, having **(b) Having, where** (c) Group by, having (d) Group by, where

14. Select correct SQL query from below to find the temperature in increasing order of all cites.
(a) SELECT city FROM weather ORDER BY temperature;
(b) SELECT city, temperature FROM weather;
(c) SELECT city, temperature FROM weather ORDER BY temperature;
(d) SELECT city, temperature FROM weather ORDER BY city;

15. In SQL, which command is used to SELECT only one copy of each set of duplicable rows
(a) **SELECT DISTINCT** (b) SELECT UNIQUE
(c) SELECT DIFFERENT (d) All of the above

16. Which operator tests column for the absence of data (i.e., NULL value) ?
(a) EXISTS operator (b) NOT operator
(c**) IS operator** (d) None of these

17. Consider the following query:
SELECT name FROM class WHERE subject_____NULL;
Which comparison operator may be used to fill the blank space in above query?
(a) = (b) LIKE (c) **IS/IS Not** (d) if

VERY SHORT ANSWER QUESTIONS (1 MARKS EACH)

Q1. Name the command/clause which is used to display the records in ascending or descend ing order.

Answer: Order by

Q2. Give example of any two DML commands.

Answer: Insert , Delete

Q3. What is the purpose of SQL?

Answer: SQL is structured query language. It is a standard language of all the RDBMS

Q4. What is primary key?

Answer: A field which is unique for each and every record in table is called primary key.

Q5. Which command is used to display a list of already existing tables?

Answer: show tables;

Q6. Which command is used to change the structure of table?

Answer: Alter

Q7. Which command is used to change the data of the table?

Answer: Update

Q8. Which command is used to delete data of the table?

Answer: Delete

Q9. Which command delete the structure of table?

Answer: Drop

Q10. Identify the DDL and DML commands from the following: Create, Delete

Answer: DDL: create, DML:insert

Q11. Which clause is used with aggregate functions? (Group by/ Where)

Answer: Group by

Q12. What do you mean by candidate key?

Answer: Those fields which can act as primary key is called candidate key.

Q13. Correct the error in the following query.

Select * from RECORD where Rname = %math%;

Answer: Select * from RECORD where Rname like %math%;

Q14. What is max () function in SQL?

Answer: Ans. It returns the largest value from a particular column.

Q15. What do you mean by degree and cardinality of table?

Answer: Number of columns in table is called degree. Number of rows in a table is called cardinality.

Q16. Expand DDL and DML

Answer: DDL – Data Definition Language, DML – Data Manipulation Language.

Q17. Which command is used to increase the salary of workers in table salary? (Update / Alter)

Answer: Update

Q18. What is the difference between char and varchar?

Answer: Char is fixed length data type and varchar is variable length data type.

Fill in the blanks

1. SQL stands for_____Query Language.
   Answer: Structure Query Language
2. A connectivity package such as_____must be imported before writing database connectivity Python code.
   Answer: Mysql.connector
3. The SQL keyword_____is used to specify the table(s) that contains the data to be retrieved.

Answer: FROM

4. To remove duplicate rows from the result of a query, specify the SQL qualifier in select list.
   Answer: Distinct
5. To obtain all columns, use a(n)_____instead of listing all the column names in the select list.
   Answer: Asterisk (*)
6. The SQL_____clause contains the condition that specifies which rows are to the selected. WHERE
   Answer:
7. To sort the rows of the result table, the _____clause is specified.
   Answer: Order by
8. Columns can be sorted in descending sequence by using the SQL keyword _____
   Answer: DESC
9. When two conditions must both be true for the rows to be selected, the conditions are separated by the SQL keyword ____
   Answer: AND
10. To refer to a set of values needed for a condition, we can use the SQL operation _____
    Answer: IN
11. To exclude one or more values (a list of values) using a condition, the SQL keyword_____should be used.
    Answer: NOT IN

12. The SQL keyword_____is used in SQL expressions to select based on patterns.
    Answer: LIKE
13. The SQL built-in function_____totals values in numeric columns.
    Answer: SUM
14. The SQL built-in function_____obtains the largest value in a numeric column.
    Answer: MAX

SHORT ANSWER QUESTIONS (2 MARKS EACH)

Q1. What is the difference between cardinality and degree?.
Q.2 Differentiate between WHERE and HAVING clause.
Q.3 Define Primary Key of a relation in SQL. Give an Example using a dummy table.
Q.4 Consider the following Python code is written to access the record of CODE passed to function: Complete the missing statements:

def Search(eno):

#Assume basic setup import, connection and cursor is created
query="select * from emp where empno=_____".format(eno)
mycursor.execute(query)
*results = mycursor.*_____
print(results)

Q. 5 Differentiate between DDL and DML with one Example each.
Q.6 Answer the following:
i) Name the package for connecting Python with MySQL database.
ii) What is the purpose of cursor object?
Q.7 What do you mean by domain of an attribute in DBMS? Explain with an example.
Q.8 Differentiate between fetchone() and fetchmany() methods with suitable examples.
Q.9 What is Constraint ? Give example of any two constraints.
Q.10 Write the steps to perform an Insert query in database connectivity application. Table 'student' values are rollno, name, age (10,'Ashok',26)
Q.11 Define Candidate Key and Alternate Key with suitable examples from a table containing some meaningful data.
Q.12 Define RDBMS. Name any two RDBMS software.
Q.13 What is the purpose of the following clauses in a select statement?
i) ORDER BY ii) HAVING
Q.14 Write SQL queries for the following:
i. Create the table Product with appropriate data types and constraints.
ii. Identify the primary key in Product.
Q.15 Write any two differences between Single_row functions and Aggregate functions.

ANSWERS-(SHORT ANSWER QUESTIONS (2 MARKS EACH)

ANS .1 Degree - The number of attributes or columns in a relation is called the Degree of the relation.

Cardinality - The number of tuples/ rows in a relation is called the Cardinality of the relation.

ANS.2 WHERE clause is used to select particular rows that satisfy a condition whereas HAVING clause is used in connection with the aggregate function, GROUP BY clause.

For ex. – select * from student where marks > 75;

This statement shall display the records for all the students who have scored more than 75 marks. On the contrary, the statement – select * from student group by stream having marks > 75; shall display the records of all the students grouped together on the basis of stream but only for those students who have scored marks more than 75.

Ans.3 Primary Key- one or more attribute of a relation used to uniquely identify each and every tuple in the relation. For Example : In the below Table Student, RollNo can be the Primary Key

RollNo	Name	Marks
1	Pratham	75
2	Srishti	80

Ans. 4 { } and fetchone()

Ans 5 DDL- Data definition language. Consists of commands used to modify the metadata of a table. For Example- create table, alter table, drop table

DML-Data manipulation language. Consist of commands used to modify the data of a table. For Example- insert, delete, update

Ans 6 .i) import mysql.connector

ii) It is the object that helps to execute the SQL queries and facilitate row by row processing of records in the resultset.

Ans 7 Domain of an attribute is the set of values from which a value may come in a column. E.g. Domain of section field may be (A,B,C,D).

Ans 8 fetchone() is used to retrieve one record at a time but fetchmany(n) will fetch n records at a time from the table in the form of a tuple.

Ans 9 .Constraints are the checking condition which we apply on table to ensure the correctness of data . Example primary key, not null, default, unique etc

Ans 10 import mysql.connector as mydb

```
conn= mydb.connect(host="localhost", user="root", passwd="1234")
cur=conn.cursor()
cur.execute("INSERT INTO student values(10,'Ashok',26);")
cur.commit()
```

Ans.11 A table may have more than one such attribute/group of attributes that identifies a tuple uniquely, all such attribute(s) are known as Candidate Keys. All the candidate key except primary key are called Alternate key.

Table: Employee (**empno**, aadhar_no, voter_id, ename, deptno, sal, city)

In the above table Employee, empno,aadhar_no, voter_id all are candidate key If we define empno as primary key then remaining candidate keys will be alternate key.

Ans.12 RDBMS stands for Relational Database Management System. It is a program that offers commands to create, update, and manage the data with multiple tables. Examples of RDBMS are

1. MySQL
2. Oracle
3. Microsoft SQL Server.

Ans.13

i) Order By : This clause is used to arrange the records in ascending or descending order. for example Select * from book order by price;

ii) Having : HAVING Clause in SQL is used to specify conditions on the rows with GROUP BY clause. for example Select sum(price) from book group by (subject) having price > 100;

Ans 14.

i) Create table product(Pcode varchar(3) not null Primary key , PName Varchar(20), UPrice int(4), Manufacture Varchar(20));

ii) Pcode is primary key.

Ans.15

Single row Functions	**Multiple row functions / Aggregate Functions**
It operates on a single row at a time.	It operates on multiple rows.
It returns one result per row	It returns one result for multiple rows.
It can be used in Select, Where, and Order by clause.	It can be used in the select clause only.
Math, String and Date functions are examples of single row functions.	Max(), Min(), Avg(), Sum(), Count() and Count(*) are examples of multiple row functions.

CASE STUDY BASED QUESTIONS/SQL-OUTPUT QUESTIONS (3 MARKS)

Q1. Consider the following tables FACULTY and COURSES and give outputs for SQL queries (i) to (iii)

FACULTY

F_ID	**Fname**	**Lname**	**Hire_date**	**Salary**
102	Amit	Mishra	12-10-1998	12000
103	Nitin	Vyas	24-12-1994	8000
104	Rakshit	Soni	18-5-2001	14000
105	Rashmi	Malhotra	11-9-2004	11000
106	Sulekha	Srivastava	5-6-2006	10000

COURSES

C_ID	F_ID	Cname	Fees
C21	102	Grid Computing	40000
C22	106	System Design	16000
C23	104	Computer Security	8000
C24	106	Human Biology	15000
C25	102	Computer Network	20000
C26	105	Visual Basic	6000

i) Select COUNT(DISTINCT F_ID) from COURSES;
ii) Select MIN(Salary) from FACULTY,COURSES where COURSES.F_ID = FACULTY.F_ID;
iii) Select avg(Salary) from FACULTY where Fname like 'R%'

CID	NAME	CITY	PRODUCTNAME
111	SONY	DELHI	TV
222	NOKIA	MUMBAI	MOBILE
333	ONIDA	DELHI	TV
444	SONY	MUMBAI	MOBILE
555	BLACKBERRY	MADRAS	MOBILE
666	DELL	DELHI	LAPTOP

Q.2Write output for (i) & (iii) basedon a table COMPANY and CUSTOMER.

COMPANY

CUSTOMER

CUSTID	NAME	PRICE	QTY	CID
101	Rohan Sharma	70000	20	222
102	Deepak Kumar	50000	10	666
103	Mohan Kumar	30000	5	111

104	Sahil Bansal	35000	3	333
105	Neha Soni	25000	7	444
106	Sonal Aggarwal	20000	5	333
107	Arjun Singh	50000	15	666

(i) SELECT COUNT(*) ,CITY FROM COMPANY GROUP BY CITY;

(ii) SELECT MIN(PRICE), MAX(PRICE) FROM CUSTOMER WHERE QTY>10 ;

(iii) SELECT AVG(QTY) FROM CUSTOMER WHERE NAME LIKE "%r%;

Q.3 Write output for (i) to (iii) based on the tables 'Watches' and 'Sale' given below.

Table: Watches

Watchid	Watch_Name	Price	Type	Qty_Store
W001	HighTime	10000	Unisex	100
W002	LifeTime	15000	Ladies	150
W003	Wave	20000	Gents	200
W004	HighFashion	7000	Unisex	250
W005	GoldenTime	25000	Gents	100

Table: Sale

Watchid	Qty_Sold	Quarter
W001	10	1
W003	5	1
W002	20	2
W003	10	2
W001	15	3
W002	20	3
W005	10	3
W003	15	4

i. select quarter, sum(qty_sold) from sale group by quarter;

ii. select watch_name,price,type from watches w, sale s wherew.watchid!=s.watchid;

iii. select watch_name, qty_store, sum(qty_sold), qty_store-sum(qty_sold) "Stock"

from watches

w, sale s where w.watchid=s.watchid group by s.watchid;

Q.4 Write the output for SQL queries (i) to (iii), which are based on the table:

Employees

Employees

Empid	Firstname	Lastname	Designation	City	Salary
010	Ravi	Kumar	Manager	GZB	75000

105	Harry	Waltor	Manager	GZB	65000
152	Sam	Tones	Director	Paris	80000

215	Sarah	Ackerman	Manager	Upton	75000
244	Manila	Sengupta	Clerk	New Delhi	50000
300	Robert	Samuel	Clerk	Washington	45000
335	Ritu	Tondon	Clerk	GZB	40000
400	Rachel	Lee	Salesman	New York	32000
441	Peter	Thompson	Salesman	Paris	28000

(i) Select Designation , count(*) from Employees Group by Designation Having count(*)>=3;

(ii) Select Max (salary), Min(Salary) from Employees Where City in ('GZB', 'Paris');

(iii) Select Firstname, Lastname from Employees where Firstname like 'R%';

Q.5 Write output for queries (i) to (iii), which are based on the table:

Books.

Book_id	Book_name	Author_name	Publisher	Price	Qty
C0001	Fast Cook	Lata Kapoor	EPB	355	5
F0001	The Tears	William hopkin	NIL	650	20
T0001	My First Py	Brain& Brooke	EPB	350	10
T0002	Brain works	A.W. Rossaine	TDH	450	15
F0002	Thunderbolts	Anna Roberts	NIL	750	5

i. Select Count(Publisher) from Books;

ii. Select Max(Price) from books where qty >=15;

iii. Select count(distinct publishers) from books where Price>=400;

ANSWERS

ANS .1 (i) 4 (ii) 6000 (iii) 12500

Ans.2

(i) Count(*) CITY
3 DELHI
2 MUMBAI
1 MADRAS

(ii) MIN (PRICE) -50000
MAX (PRICE) -7000

(iii) AVG (QTY)
11

Ans.3

(i) Quarter sum(qty_sold)
1 15
2 30

3 45

4 15

(ii) watch_name price type
HighFashion 7000 Unisex

(iii)

watch_name	qty_store	qty_sold	Stock
HighTime	100	25	75
LifeTime	150	40	110
Wave	200	30	170
GoldenTime	100	10	90

Ans4.

(i) Mana ger 3

Clerk 3

(ii) 80000 28000

(iii) Ravi Kumar Robert
Samuel Ritu
Tondon Rachel
Lee

Ans .5

(i) 3 (ii)650 (iii)TDH

CASE STUDY BASED QUESTIONS (5 MARKS EACH)

1. Write SQL commands for (a) to (e) on the basis of table GRADUATE.

Table: GRADUATE

S.NO.	NAME	STIPEND	SUBJECT	AVERAGE	DIV
1	KARAN	400	PHYSICS	68	1
2	DIVAKAR	450	COMPUTER SC	68	1
3	DIVYA	300	CHEMISTRY	62	2
4	ARUN	350	PHYSICS	63	1
5	SABINA	500	MATHEMATICS	70	1
6	JOHN	400	CHEMISTRY	55	2
7	ROBERT	250	PHYSICS	64	1
8	RUBINA	450	MATHEMATICS	68	1
9	VIKAS	500	COMPUTER SC	62	1
10.	MOHAN	300	MATHEMATICS	57	2

(a) List the names of those students who have obtained DIV 1 sorted by NAME.

(b) Display a report, listing NAME, STIPEND, SUBJECT and amount of stipend received in a year assuming that the STIPEND is paid every month.

(c) To count the number of students who are either PHYSICS or COMPUTER SC graduates.

(d) To insert a new row in the GRADUATE table:
11, "KAJOL", 300, "COMPUTER SC", 75, 1

(e) Display Name of the students whose average is more than 65.

Q.2 Write SQL commands for (a) to (e) on the basis of table CLUB.

Table: CLUB

COACH ID	COACH NAME	AGE	SPORTS	DATEOFAPP	PAY	SEX
1.	KUKREJA	35	KARATE	27/03/1997	1000	M
2.	RAVINA	34	KARATE	20/01/1998	1200	F
3.	KARAN	34	SQUASH	19/02/1998	2000	M
4.	TARUN	33	BASKETBALL	01/01/1998	1500	M
5.	ZUBIN	36	SWIMMING	12/01/1998	750	M
6.	KETAKI	36	SWIMMING	24/02/1998	800	F
7.	ANKITA	39	SQUASH	20/02/1998	2200	F
8.	ZAREEN	37	KARATE	20/02/1998	1100	F
9.	KUSH	41	SWIMMING	13/01/1998	900	M
10.	SHAILYA	37	BASKETBALL	19/02/1998	1700	M

(a) To show all information about the swimming coaches in the club.

(b) To list names of all coaches with their date of appointment (DATOFAPP) in descending order.

(c) To display a report, showing coachname, pay, age and bonus (15% of pay) for all the coaches.

(d) To insert in a new row in the **CLUB** table with the following data: 11, "PRAKASH", 37, "SQUASH", {25/02/98}, 2500, "M"

(e) Display Coachname ,Sports,Pay from the table .

3. Write SQL command for (a) to (e) on the basis of tables INTERIORS and NEWONES.

Table: INTERIORS

NO	ITEMNAME	TYPE	DATEOFSTOCK	PRICE	DISCOUNT
1	Red rose	Double bed	23/02/02	32000	15
2	Soft touch	Baby cot	20/01/02	9000	10
3	Jerry's home	Baby cot	19/02/02	8500	10
4	Rough wood	Office Table	01/01/02	20000	20
5	Comfort zone	Double bed	12/01/02	15000	20
6	Jerry look	Baby cot	24/02/02	7000	19
7	Lion king	Office Table	20/02/02	16000	20
8	Royal tiger	Sofa	22/02/02	30000	25
9	Park sitting	Sofa	13/12/01	9000	15

10	Dine Paradise	Dining Table	19/02/02	11000	15

Table: NEWONES

NO	ITEMNAME	TYPE	DATEOFSTOCKS	PRICE	DISCOUNT
11	White wood	Double bed	23/03/03	20000	20
12	James 007	Sofa	20/02/03	15000	15
13	Tom look	Baby cot	21/02/13	7000	10

(a) To show all information about the sofas from the **INTERIORS** table.

(b) To list the **ITEMNAME** which are priced at more than 10,000 from the **INTERIORS** table.

(c) To list **ITEMNAME** and TYPE of those items, in which **DATEOFSTOCK** is before 22/01/02 from the **INTERIERS** table in the descending order of

(d)To display **ITEMNAME** and **DATEOFSTOCK** of those items, in which the discount Percentage is more than 15 from **INTERIORS** table.

(e)To count the number of items, whose type is "**Double Bed**" from **INTERIOR** table.

4. Write SQL command for (a) to (e) on the bases of tables FURNITURE **AND** ARRIVALS.

Table: FURNITURE

NO.	ITEMNAME	TYPE	DATEOFSTOCK	PRICE	DISCOUNT
1	White lotus	Double Bed	23/02/02	30000	25
2	Pink feather	Baby cot	20//01/02	7000	20
3	Dolphin	Baby cot	19/02/02	9500	20
4	Decent	Office Table	01/01/02	25000	30
5	Comfort zone	Double Bed	12/01/02	25000	25
6	Donald	Baby cot	24/02/02	6500	15
7	Royal Finish	Office Table	20/02/02	18000	30
8	Royal tiger	Sofa	22/02/02	31000	30
9	Econo sitting	Sofa	13/12/01	9500	25
10	Eating paradise	Dining Table	19/02/02	11500	25

Table: ARRIVALS

NO.	ITEMNAME	TYPE	DATEOFSTOCK	PRICE	DISCOUNT
11	Wood Comfort	Double Bed	23/03/03	25000	25
12	Old Fox	Sofa	20/02/03	17000	20
13	Micky	Baby cot	21/02/02	7500	15

(a) To show all information about the baby cots from the FURNITURE table.
(b) To list the ITEMNAME which are priced at more than 15000 from the FURNITURE table.
(c) To list ITEMNAME AND TYPE of those items, in which DATEOFSTOCK is before 22/01/02from the FURNITURE table in descending order of ITEMNAME.
(d) To display ITEMNAME and DATEOFSTOCK of those items, in which the DISCOUNTpercentage is more than 25 from FURNITURE table.
(e) To insert a new row in the ARRIVALS table with the following data:14, “Velvet touch”, Double bed”,
{25/03/03}, 25000, 30

ANSWERS:

CASE STUDY BASED QUESTIONS

1.(a) Select Name From GRADUATE Where DIV = 1 Order by Name;

(b) Select Name, stipend, subject, stepend *12 From GRADUATE

(c) Select count (*) From GRADUATE Where subject IN ("PHYSICS", "COMPUTER SC");

(d) Insert into GRADUATE Values (11, "KAJOL", 300, "COMPUTER SC", 75,1);

(e) Select name from Graduate where average>65

2. (a) Select * From CLUB Where sports = "SWIMMING";

(b) Select COACHNAME From CLUB order by DATOFAPP desc

(c) Select coachname, pay, age, 0.15 * pay From CLUB;

(d) Insert into CLUB Values (11, "PRAKASH", 37, "SQUASH", {25/02/98], 2500, "M");

(e) Select Coachname ,Sports,Pay from Club .

3 (a) Select * From
(b) INTERIORS Where
(c) TYPE = "Sofa"; Select ITEMNAME From
(d) INTERIORS Where PRICE > 10000;
Select ITEMNAME, TYPE From

4 (a) INTERIORS
(b) Where DATEOFSTOCK < {22/01/02} Order by
(c) ITEMNAME desc;
(d) Select ITEMNAME, DATEOFSTOCK From INTERIORS Where DISCOUNT > 15;

(e)Select Count (*) From INFERIORS Where TYPE = "Double Bed";

Select * From FURNITURE Where TYPE = "Baby cot";
Select ITEMNAME From FURNITURE Where PRICE > 15000;
Select ITEMNAME, TYPE From

FURNITURE
Where DATEOFSTOCK <
{22/01/02} Order by ITEMNAME
desc; Select ITEMNAME,
DATEOFSTOCK From
FURNITURE Where DISCOUNT
> 25.

(e) Insert Into ARRIVALS Values (14, “Velvet touch”, “Double bed”, {25/03/03}, 25000,30);

DATABASE MANAGEMENT SYSTEM

GIST OF THE TOPIC

- **Data :** Raw facts and figures.
- **Information :** Processed form of data.
- **Database :** It is defined as a collection of interrelated data stored together. It should be accurate, private and protected from damage.
- **Domain :** It is a pool of values from which the actual values appearing in a given column are drawn.
- **Relation :** A relation is a table.
- **Tuple :** The rows of a table.
- **Attribute :** The columns of a table.
- **Degree :** The number of attributes in a relation are known as the degree of a relation.
- **Cardinality :** The number of rows in a relation are known as the degree of a relation.
- **Candidate Key :** All attribute combinations inside a relation that can serve as primary key are candidate keys as they are candidates for the primary key position.
- **Primary Key :** It is a set of one or more attributes that can uniquely identify tuples within the relation.
- **Alternate Key :** A candidate key that is not the primary key is called an alternate key.
- **Foreign Key :** A non key attribute whose values are derived from the primary key of some other tables.
- **Constraint :** Rule and conditions set for data being stored in a database.
- **View :** It is a virtual table that does not really exist in its right but is instead derived from one or more underlying tables.
- **MySQL :** It is a freely available open source Relational database management system that uses structured query language.
- **Char vs Varchar :** Char field has fixed length and varchar has variable length field.

OBJECTIVE TYPE QUESTIONS

MULTIPLE CHOICE QUESTIONS

1. A_____is a property of the entire relation, which ensures through its value that each tuple is unique in a relation. 1
   (a) Rows (b) Key (c) Attributes (d) Fields

2. A relational database can have how many type of keys in a table ? 1
   (a) Candidate Key (b) Primary Key (c) Foreign Key (d) All of these

3. Which one of the following uniquely identifies the tuples / rows in a relation. 1
   (a) Secondary Key (b) Primary Key (c) Composite Key (d) Foreign Key

4. The Primary key is selected from the set of_____. 1
   (a) Composite Key (b) Determinants (c) Candidates Key (d) Foreign Key

5. Which of the following is a group of one or more attributes that uniquely identifies a row? 1
   (a) Key (b) Determinant (c) Tuple (d) Relation

6. Which of the following attributes cannot be considered as a choice for Primary Key ? 1
   (a) Id (b) License number (c) Dept_Id (d) Street

7. An attribute in a relation is a foreign key if it is the_____key in any other relation. 1
   (a) Candidate (b) Primary (c) Super (d) Sub

8. Consider the table with structure as : 1
   Student(ID, name, dept_name, tot_cred)
   In the above table, which attribute will form the primary key?
   (a) name (b) dept_name (c) Total_credits (d) ID

9. Which of the following is not a legal sub-language of SQL ? 1
   (a) DDL (b) QAL (c) DML (d) TCL

10. Which of the following is a DDL command? 1
    (a) SELECT (b) ALTER (c) INSERT (d) UPDATE

11. In SQL, which of the following will select only one copy of each set of duplicate rows from a table.
    (a) SELECT UNIQUE
    (b) SELECT DISTINCT
    (c) SELECT DIFFERENT
    (d) All of these.

12. Which of the following keywords will you use in the following query to display the unique values of the column dept_name? 1
    SELECT_____dept_name FROM COMPANY;
    (a) All (b) From (c) Distinct (d) Name

13. The___clause of SELECT query allows us to select only those rows in the result that satisfy a specified condition. 1
    (a) where (b) from (c) having (d) like

14. Which operator can take wild card characters for query condition? 1
(a) BETWEEN (b) LIKE (c) IN (d) NOT

15. Which operator checks a value against a range of values? 1
(a) BETWEEN (b) LIKE (c) IN (d) NOT

16. Which of the following SQL commands retrives data from table(s) ? 1
(a) UPDATE (b) SELECT (c) Union (d) All of these

17. Which of the following queries contains an error ? 1

(a) Select * from emp where empid=10003;
(b) Select empid from emp where empid=10006;
(c) Select empid from emp;
(d) Select empid where empid=10009 and lastname= 'GUPTA';

18. Consider the following table namely Employee : 1

Employee_id	Name	Salary
1001	Misha	6000
1009	Khushi	4500
1018	Japneet	7000

Which of the names will not be displayed by the below given query ?

SELECT name from Employee WHERE employee_id>1009;

(a) Misha, Khushi (b) Khushi, Japneet (c) Japneet (d)Misha, Japneet

19. Which operator perform pattern matching ? 1
(a) BETWEN (b) LIKE (c) IN (d) NOT

20. Consider the following query 1
SELECT name FROM class WHERE Subject LIKE '___Informatics Practices';

Which one of the following has to be added into the blank space to select the subject which has *informatics practices* as its ending string?

(a) $ (b) _ (c) || (d) %

21. Which operator tests a column for the absence of data(i.e. NULL value) ? 1
(a) Exist Operator (b) NOT Operator (c) IS Operator (d) None of these

22. Which clause is used to sort the query result ? 1
(a) Order By (b) Sort By (c) Group By (d) Arrange By

23. By default ORDER BY clause list the result in_____order. 1
(a) Descending (b) Any (c) Same (d) Ascending

24. Consider the following query 1
SELECT * FROM employee ORDER BY salary_____, name_____;
To display the salary from greater to smaller and name in alphabetical order which of the following options should be used ?

(a) Ascending, Descending
(b) Asc, Desc
(c) Desc, Asc
(d) Descending, Ascending

25. What is the meaning of **Remark LIKE "%5%5%";**
(a) Column Remark begin with two 5s
(b) Column Remark ends with two 5s
(c) Column Remark has more than two 5s
(d) Column Remark has two 5s in it, at any position

26. In SQL, which command(s) is/are used to change a table's structure/characteristics?
(a) ALTER TABLE (b) MODIFY TABLE (c) CHANGE TABLE (d) All of these

27. Which of the following is/are the DDL Statement ?
(a) Create (b) Drop (c) Alter (d) All of these

28. A Table can have _____
(a) Many primary keys and many unique keys.
(b) One primary key and one unique key
(c) One primary key and many unique keys.
(d) Many primary keys and one unique key.

29. Which of the following types of table constraints will prevent the entry of duplicate rows?
(a) Unique (b) Distinct (c) Primary Key (d) Null

30. Consider the following SQL Statement. What type of statement is this ? INSERT INTO instructor VALUES (10211, 'SHREYA' , 'BIOLOGY', 69000);
(a) Procedure (b) DML (c) DCL (d) DDL

31. Which of the following statements will delete all rows in a table namely *mytable*without deleting the table's structure.
(a) DELETE FROM mytable;'
(b) DELETE TABLE mytable;
(c) DROP TABLE mytable;
(d) None of these.

32. Which of the following query will drop a column from a table ?
(a) DELETE COLUMN column_name;
(b) DROP COLUMN column_name;
(c) ALTER TABLE table_name DROP COLUMN column_name;
(d) None of these

33. Logical operator used in SQL are:
(a) AND, OR, NOT (b) &&, ||, ! (c) $,|,! (d) None of these

34. Which of the following requirement can be implemented using a CHECK constraint?
(a) Student must be greater than 18 years old.
(b) Student must be form a BRICS Country (Brazil, Russia, India, China, South Africa)
(c) Student's roll number must exist in another table(say, namely Eligible)
(d) None of these

35. An attribute in a relation is termed as a foreign key when it reference the_____of another relation.
(a) Foreign Key (b) Primary Key (c) Unique Key (d) Check Constraint

36. Data integrity constraints are used to : 1
(a) Control the access and rights for the table data.
(b) Ensure the entry of unique records in a table.
(c) Ensure the correctness of the data entered in the table as per some rule or condition etc.
(d) Make data safe from accidental changes.

37. A relationship is formed via_____that relates two tables where one table references other table's key. 1
(a) Candidate Key (b) Primary Key (c) Foreign Key (d) Check Constraint

38. What is the maximum value that can be stored in NUMBERIC(4,2)? 1
(a) 9999.99 (b) 99.9999 (c) 99.99 (d) 9.99

39. What should be the data type for the column *Price*storing values less than Rs.1000 e.g. 200.21 1
(a) VARCHAR(50) (b) NUMBER (c) NUMBER(5,2) (d) NUMBER(6)

40. What is *aname*in the following SQL Statement ? 1
SELECT aname FROM table1 UNION SELECT aname FROM table2;
(a) row name (b) column Name (c) table name (d) database name

41. Data manipulation language (DML) includes statements that modify the_____of the tables of database. 1
(a) Structure (b) Data (c) User (d) Size

42. All aggregate functions ignore NULLs except for the_____function. 1
(a) Distinct (b) Count(*) (c) Average() (d) None of these

43. Which of the following are correct aggregate functions in SQL 1
(a) AVERAGE() (b) MAX() (c) COUNT() (d) TOTAL()

44. Identify the correct INSERT queries from the following : 1

(a) INSERT INTO Persons(‘xxx1’, ‘yyy1’);
(b) INSERT INTO Persons(LastName, FirstName) Values (‘xxx’, ‘yyy’);
(c) INSERT INTO Persons Values(‘xxx1’ , ‘yyy1’);
(d) INSERT INTO Persons Value(‘xxx1’ , ‘yyy1’);

FILL IN THE BLANKS

1. The SQL keyword_____is used to specify the table(s) that contains the data to be retrieved. 1

2. The_____command of SQL lets you make queries to fetch data from tables. 1

3. To remove duplicate rows from the result of a query, specify the SQL qualifier____in select list. 1

4. To obtain all columns, use a(n)_____instead of listing all the column names in the select list. 1

5. The SQL_____clause contains the condition that specifies which rows are to be selected. 1

6. The SQL keyword_____is used in SQL expressions to select records based on patterns. 1

7. The_____operator is used for making range checks in SELECT queries. 1

8. The null values in a column can be searched for in a table using ____ _____in the WHERE clause of SELECT query. 1

9. To sort the rows of the result table, the _____clause is specified.

10. Columns can be sorted in descending sequence by using the SQL keyword_____. 1

11. By default, ORDER BY clause lists the records in_____order. 1

12. A database can be opened with_____<database> command. 1

13. _____command is used to create new relations in a database 1

14. A_____is a condition or check applicable on a field or set of fields. 1

15. The_____constraint creates a foreign key. 1

16. To define a column as a primary key, _____ _____ constraint is used in CREATE TABLE. 1

17. _____is used to insert data in an existing table. 1

18. Rows of a table can be deleted using_____command. 1

19. To increase the size of a column in an existing table, use commond_____. 1

20. _____command removes a table from a database permanently. 1

21. _____command is used to alter the definition of already created table. 1

22. To remove table data as well table structure, use command _____ 1

23. Use _____command to add new columns in an existing table. 1

24. A column added via ALTER TABLE command initially contains_____value for all rows. 1

25. Issue_____command to make changes to table permanent. 1

26. The _____clause is used to divide result of SELECT query in groups. 1

27. To specify condition with a GROUP BY clause, _____clause is used. 1

28. Only_____functions are used with GROUP BY clause. 1

29. Nested grouping can be done by providing _____in the GROUP BY expression. 1

30. The_____clause is used in SELECT queries to specify filtering condition for groups. 1

31. Aggregate Functions cannot be used in_____clause of the Select query. 1

32. The SQL built-in function_____total values in numeric columns. 1

33. The SQL built-in function_____computes the average of values in numeric columns. 1

34. The SQL built-in function_____obtains the largest value in a in numeric columns. 1

35. The SQL built-in function_____obtains the smallest value in a in numeric columns. 1

36. The SQL built-in function_____computes the number of rows in a table. 1

37. The functions that work with one row at a time are _____functions. 1

38. To compare an aggregate value in a condition,_____clause is used. 1

TRUE AND FALSE QUESTIONS

1. A primary key can store empty values in it. 1

2. Common attribute of two tables is called a foreign key. 1

3. A common attribute of two tables is called a foreign key it is the primary key in one table and the other table reference it. 1

4. Part of SQL which creates and defines tables and other database objects, is called DDL 1

5. Part of SQL which manipulates data in tables, is called TCL 1

6. Part of SQL which access and manipulates data in tables is called DML 1

7. Part of SQL which controls transactions, is called TCL. 1

8. MySQL is name of customized query language used by Oracle. 1

9. SQL is a case sensitive.

10. The condition in a WHERE clause in a SELECT query can refer to only one value. 1

11. SQL provides the AS keyword, which can be used to assign meaningful column name to the results of queries using the SQL built-in functions. 1

12. SQL is a programing language. 1

13. SELECT DISTINCT is used if a user wishes to see duplicate columns in a query. 1

14. ORDER BY can be combined with SELECT statement. 1

15. DELETE FROM <table> command is same as DROM TABLE <table> command. 1

16. The unique constraint can only be defined once in the CREATE TABLE command. 1

17. Unique and Primary Key constraints are the same. 1

18. Tuple based constraints can use multiple columns of the table. 1

VERY SHORT ANSWER QUESTIONS (1 MARKS EACH)

Q1. Name the command/clause which is used to display the records in ascending or descending order.

Q2. Give example of any two DML commands.

Q3. What is the purpose of SQL?

Q4. What is primary key?

Q5. Which command is used to display a list of already existing tables?

Q6. Which command is used to change the structure of table?

Q7. Which command is used to change the data of the table?

Q8. Which command is used to delete data of the table?

Q9. Which command delete the structure of table?

Q10. Identify the DDL and DML commands from the following:

Create, Delete

Q11. Which clause is used with aggregate functions? (Group by/ Where)

Q12. What do you mean by candidate key?

Q13. Correct the error in the following query.

Select * from RECORD where Rname = %math%;

Q14. What is max () function in SQL?

Q15. What do you mean by degree and cardinality of table?

Q16. Expand DDL and DML

Q17. Which command is used to increase the salary of workers in table salary? (Update / Alter)

Q18. Name the command used to see the structure of table.

Q19. Which aggregate function is used to find sum of column in a table?

Q20. What is the difference between having and where clause?

Q21. Name an aggregate function in SQL which return the average of numeric values.

Q22. What is the use of “like” in SQL?

Q23. Correct the following statement:

Delete table data;

Q24. What do you mean by aggregate function?

Q25. Write two wild card characters which are used with like operator?

Q26. Duplication of record is called_____

Q27. What is the difference between char and varchar?

SHORT ANSWER QUESTION (2 MARKS EACH)

Q1. What is the difference between cardinality and degree?.

Q.2 Differentiate between WHERE and HAVING clause.

Q.3 Define Primary Key of a relation in SQL. Give an Example using a dummy table.

Q.4 Consider the following Python code is written to access the record of CODE passed to function: Complete the missing statements:

```
def Search(eno):
#Assume basic setup import, connection and cursor is created query="select * from emp where empno=
  ".format(eno) mycursor.execute(query)
results = mycursor.        print(results)
```

Q5. Differentiate between DDL and DML with one Example each.

Q6. Answer the following:

i) Name the package for connecting Python with MySQL database.

ii) What is the purpose of cursor object?

Q.7 What do you mean by domain of an attribute in DBMS? Explain with an example.

Q.8 Differentiate between fetchone() and fetchmany() methods with suitable examples.

Q.9 What is Constraint ? Give example of any two constraints.

Q.10 Write the steps to perform an Insert query in database connectivity application. Table ‘student’ values are rollno, name, age (10,’Ashok’,26)

Q.11 Define Candidate Key and Alternate Key with suitable examples from a table containing some meaningful data.

Q.12 Define RDBMS. Name any two RDBMS software.

Q.13 What is the purpose of the following clauses in a select statement?

i)ORDER BY ii) HAVING

CASE STUDY BASED QUESTIONS (3 MARKS EACH)

Q1. Consider the following tables FACULTY and COURSES and give outputs for SQL queries (i) to (iii)

FACULTY

F_ID	**Fname**	**Lname**	**Hire_date**	**Salary**
102	Amit	Mishra	12-10-1998	12000
103	Nitin	Vyas	24-12-1994	8000
104	Rakshit	Soni	18-5-2001	14000
105	Rashmi	Malhotra	11-9-2004	11000
106	Sulekha	Srivastava	5-6-2006	10000

COURSES

C_ID	F_ID	Cname	Fees
C21	102	Grid Computing	40000
C22	106	System Design	16000
C23	104	Computer Security	8000
C24	106	Human Biology	15000
C25	102	Computer Network	20000
C26	105	Visual Basic	6000

i) Select COUNT(DISTINCT F_ID) from COURSES;
ii) Select MIN(Salary) from FACULTY,COURSES where COURSES.F_ID = FACULTY.F_ID;
iii) Select avg(Salary) from FACULTY where Fname like 'R%'

Q2. Write output for (i) & (iii) basedon a table COMPANY and CUSTOMER.

CID	NAME	CITY	PRODUCTNAME
111	SONY	DELHI	TV
222	NOKIA	MUMBAI	MOBILE
333	ONIDA	DELHI	TV
444	SONY	MUMBAI	MOBILE
555	BLACKBERRY	MADRAS	MOBILE
666	DELL	DELHI	LAPTOP

COMPANY

CUSTOMER

CUSTID	NAME	PRICE	QTY	CID
101	Rohan Sharma	70000	20	222

102	Deepak Kumar	50000	10	666
103	Mohan Kumar	30000	5	111
104	Sahil Bansal	35000	3	333
105	Neha Soni	25000	7	444
106	Sonal Aggarwal	20000	5	333
107	Arjun Singh	50000	15	666

(i) SELECT COUNT(*) ,CITY FROM COMPANY GROUP BY CITY;

(ii) SELECT MIN(PRICE), MAX(PRICE) FROM CUSTOMER WHERE QTY>10 ;

(iii) SELECT AVG(QTY) FROM CUSTOMER WHERE NAME LIKE "%r%;

Q.3 Write output for (i) to (iii) based on the tables 'Watches' and 'Sale' given below.

Table: Watches

Watchid	Watch_Name	Price	Type	Qty_Store
W001	HighTime	10000	Unisex	100
W002	LifeTime	15000	Ladies	150
W003	Wave	20000	Gents	200
W004	HighFashion	7000	Unisex	250
W005	GoldenTime	25000	Gents	100

Table: Sale

Watchid	Qty_Sold	Quarter
W001	10	1
W003	5	1
W002	20	2
W003	10	2
W001	15	3
W002	20	3
W005	10	3
W003	15	4

i. SELECT QUARTER, SUM(QTY_SOLD) FROM SALE GROUP BY QUARTER;

ii. SELECT WATCH_NAME,PRICE,TYPE FROM WATCHES W, SALE S WHEREW.WATCHID!=S.WATCHID;

Q4. Write the output for SQL queries (i) to (iii), which are based on the table: Employees

Empid	Firstname	Lastname	Designation	City	Salary
010	Ravi	Kumar	Manager	GZB	75000
105	Harry	Waltor	Manager	GZB	65000
152	Sam	Tones	Director	Paris	80000
215	Sarah	Ackerman	Manager	Upton	75000
244	Manila	Sengupta	Clerk	New Delhi	50000
300	Robert	Samuel	Clerk	Washington	45000
335	Ritu	Tondon	Clerk	GZB	40000
400	Rachel	Lee	Salesman	New York	32000
441	Peter	Thompson	Salesman	Paris	28000

i. Select Designation , count(*) from Employees Group by Designation Having count(*)>=3;
ii. Select Max (salary), Min(Salary) from Employees Where City in ('GZB', 'Paris');
iii. Select Firstname, Lastname from Employees where Firstname like 'R%';

Q5. Write output for queries (i) to (iii), which are based on the table: (Relation name : BOOKS)

Book_id	Book_name	Author_name	Publisher	Price	Qty
C0001	Fast Cook	Lata Kapoor	EPB	355	5
F0001	The Tears	William hopkin	NIL	650	20
T0001	My First Py	Brain& Brooke	EPB	350	10
T0002	Brain works	A.W. Rossaine	TDH	450	15
F0002	Thunderbolts	Anna Roberts	NIL	750	5

i) Select Count(Publisher) from Books;
ii) Select Max(Price) from books where qty >=15;
iii) Select count(distinct publishers) from books where Price>=400;

CASE STUDY BASED QUESTIONS (5 MARKS EACH)

1. Write SQL commands for (a) to (e) on the basis of table GRADUATE.

SNO	NAME	STIPEND	SUBJECT	AVERAGE	DV
1	KARAN	400	PHYSICS	68	1
2	DIVAKAR	450	COMPUTER SC	68	1
3	DIVYA	300	CHEMISTRY	62	2
4	ARUN	350	PHYSICS	63	1
5	SABINA	500	MATHEMATICS	70	1
6	JOHN	400	CHEMISTRY	55	2
7	ROBERT	250	PHYSICS	64	1
8	RUBINA	450	MATHEMATICS	68	1
9	VIKAS	500	COMPUTER SC	62	1
10.	MOHAN	300	MATHEMATICS	57	2

(a) List the names of those students who have obtained DIV 1 sorted by NAME.

(b) Display a report, listing NAME, STIPEND, SUBJECT and amount of stipend received in a year assuming that the STIPEND is paid every month.

(c) To count the number of students who are either PHYSICS or COMPUTER SC graduates.

(d) To insert a new row in the GRADUATE table:

11, “KAJOL”, 300, “COMPUTER SC”, 75, 1

(e) Display Name of the students whose average is more than 65.

2. Write SQL commands for (a) to (e) on the basis of table **CLUB**.

COACH ID	COACH NAME	AGE	SPORTS	DATEOFAPP	PAY	SEX
1.	KUKREJA	35	KARATE	27/03/1997	1000	M
2.	RAVINA	34	KARATE	20/01/1998	1200	F
3.	KARAN	34	SQUASH	19/02/1998	2000	M
4.	TARUN	33	BASKETBALL	01/01/1998	1500	M
5.	ZUBIN	36	SWIMMING	12/01/1998	750	M
6.	KETAKI	36	SWIMMING	24/02/1998	800	F
7.	ANKITA	39	SQUASH	20/02/1998	2200	F
8.	ZAREEN	37	KARATE	20/02/1998	1100	F
9.	KUSH	41	SWIMMING	13/01/1998	900	M
10.	SHAILYA	37	BASKETBALL	19/02/1998	1700	M

(a) To show all information about the swimming coaches in the club.

(b) To list names of all coaches with their date of appointment (DATOFAPP) in descending order.

(c) To display a report, showing coachname, pay, age and bonus (15% of pay) for all the coaches.

(d) To insert in a new row in the CLUB table with the following data: 11, “PRAKASH”, 37, “SQUASH”, {25/02/98}, 2500, “M”

(e) Display Coachname ,Sports,Pay from the table .

3. Write SQL commands for (a) to (e) on the basis of table INTERIORS and NEWONES.

NO	ITEMNAME	TYPE	DATEOFSTOCK	PRICE	DISCOUNT
1	Red rose	Double bed	23/02/02	32000	15
2	Soft touch	Baby cot	20/01/02	9000	10
3	Jerry’s home	Baby cot	19/02/02	8500	10
4	Rough wood	Office Table	01/01/02	20000	20
5	Comfort zone	Double bed	12/01/02	15000	20
6	Jerry look	Baby cot	24/02/02	7000	19
7	Lion king	Office Table	20/02/02	16000	20
8	Royal tiger	Sofa	22/02/02	30000	25
9	Park sitting	Sofa	13/12/01	9000	15

INTERIOR

NO	ITEMNAME	TYPE	DATEOFSTOCKS	PRICE	DISCOUNT
11	White wood	Double bed	23/03/03	20000	20
12	James 007	Sofa	20/02/03	15000	15
13	Tom look	Baby cot	21/02/13	7000	10

NEWONES

(a) To show all information about the sofas from the INTERIORS table.

(b) To list the ITEMNAME which are priced at more than 10,000 from the INTERIORS table.

(c) To list ITEMNAME and TYPE of those items, in which DATEOFSTOCK is before 22/01/02 from the INTERIERS table in the descending order of ITEMNAME.

(d) To display ITEMNAME and DATEOFSTOCK of those items, in which the discount percentage is more than 15 from INTERIORS table.

(e)To count the number of items, whose type is “Double Bed” from INTERIOR table.

4. Write SQL commands for (a) to (e) on the basis of table FURNITURE AND ARRIVAL.

NO.	ITEMNAME	TYPE	DATEOFSTOCK	PRICE	DISCOUNT
1	White lotus	Double Bed	23/02/02	30000	25
2	Pink feather	Baby cot	20//01/02	7000	20
3	Dolphin	Baby cot	19/02/02	9500	20
4	Decent	Office Table	01/01/02	25000	30
5	Comfort zone	Double Bed	12/01/02	25000	25
6	Donald	Baby cot	24/02/02	6500	15
7	Royal Finish	Office Table	20/02/02	18000	30
8	Royal tiger	Sofa	22/02/02	31000	30
9	Econo sitting	Sofa	13/12/01	9500	25
10	Eating paradise	Dining Table	19/02/02	11500	25

FURNITURE

ARRIVAL

NO.	ITEMNAM E	TYP E	DATEOFSTOC K	PRIC E	DISCOUN T
11	Wood Comfort	Doubl e Bed	23/03/03	25000	25
12	Old Fox	Sofa	20/02/03	17000	20
13	Micky	Baby cot	21/02/02	7500	15

(a) To show all information about the baby cots from the FURNITURE table.

(b) To list the ITEMNAME which are priced at more than 15000 from the FURNITURE table.

(c) To list ITEMNAME AND TYPE of those items, in which DATEOFSTOCK is before 22/01/02from the FURNITURE table in descending order of ITEMNAME.

(d) To display ITEMNAME and DATEOFSTOCK of those items, in which the DISCOUNTpercentage is more than 25 from FURNITURE table.

(e) To insert a new row in the ARRIVALS table with the following data:14, “Velvet touch”, Double bed”, {25/03/03}, 25000, 30.

5. Write SQL commands for (a) to (e) on the basis of table TEACHER.

TEACHER

No.	Name	Age	Department	Date of join	Salary	Sex
1.	Jugal	34	Computer	10/01/97	12000	M
2.	Sharmila	31	History	24/03/98	20000	F
3.	Sandeep	32	Maths	12/12/96	30000	M
4.	Sangeeta	35	History	01/07/99	40000	F
5.	Rakesh	42	Maths	05/09/97	25000	M
6.	Shyam	50	History	27/06/98	30000	M
7.	Shiv Om	44	Computer	25/02/97	21000	M
8.	Shalakha	33	Maths	31/07/97	20000	F

(a) To show all information about the teacher of history department

(b) To list the names of female teacher who are in Hindi department

(c) To list names of all teachers with their date of joining in ascending order.

(d) To display teacher’s Name, Salary, Age for male teacher only

(e) To count the number of teachers with Age>23.

6. A library uses a database management system (DBMS) to store the details of the books that it stocks, it registered members and the book-loans that the library has made. These details are stored in a database using the following three relations.

Name of the Database : KV Library
- Book (BookID : Char(5), Title : Varchar(25), Author :Varchar(25), Publisher : Varchar(100))
- Member(MemberID:Char(5), LastName:Varchar(25), FirstName:Varchar(25), Correspondence-Address : Varchar(100), Pincode : Char(6), DateofBirth : Date, EmailID : Varchar(50))
- Loan(MemberID: Char(5), BookID:Char(5), LastDate:Date, DueBackDate:Date, Returned :Boolean)

Note : The Library does not stock more than one copy of the same book.

(a) Identify the table that uses a composite primary key from the library database.

(i) Book Table (ii) Member Table (iii) Loan Table (iv) all of these

(b) Identify the possible alternate keys from relations Book and Member.

(i) Book : Title (ii) Books Author (iii) Member:EmailID (iv) Member:FirstName

(c) Can the Loan relation have an alternate key ?Why ?

(d) Write an example of the valid record for the loan relation. Write a query to insert a valid record in the Loan relation.

(e) Write a SQL query to retrieve the names and email addresses of the members who have not returned their books.

7. A library uses database management system(DBMS) to store the details of the books that it stocks, its registered membes and the book-loan that the library has made. These details are stored in a database using the following three relations.

Name of the Database : KV Library

• Book (BookID : Char(5), Title : Varchar(25), Author :Varchar(25), Publisher : Varchar(100))

• Member(MemberID:Char(5), LastName:Varchar(25), FirstName:Varchar(25), Correspondence-Address : Varchar(100), Pincode : Char(6), DateofBirth : Date, EmailID : Varchar(50))

• Loan(MemberID: Char(5), BookID:Char(5), LastDate:Date, DueBackDate:Date, Returned :Boolean)

Note : The Library does not stock more than one copy of the same book.

(a) Identify following types of keys from all the relations of the given database Foreign keys along with parent relations.

(b) Can a relation have multiple foreign keys? Give example.

(c) Can a foreign key be part of a primary key? Give example.

(d)Write a SQL query to retrieve the names and email addresses of the members belonging to KVS (they have email ids as _____@kvs.in) and wo have not returned their books.

8. FurnFly is a furniture company selling furniture to customers of its store and operates a follows:

• The store does not keep the furniture in stock.

• The company places orders for the furniture required from its suppliers ONLY AFTER a customer places an order at the store.

• When the ordered furniture arrives at the store, the customer is informed via telephone or e-mail that it is ready for delivery.

• Customers often order more than one type of furniture on the same order, for example, a sofa, two puffy chairs and centre table.

Details of the furniture, customers and orders are to be stored in a relational database using the following four relations :

Database Name : FurnFly Furnishers

Furniture (FurnitureID : Char(7), FurnitureName : Varchar(50), Category : Varchar(25), Price : Float, SupplierName : Varchar(100))

CustomerOrder(OrderId : Number(8,0), CustomerID : Char(10), OrderDate:Date) CustomerOrderLine :(OrderID : Number(8,0), FurnitureID: Char(7), Quantity: Number(4,0))

Customer :(CustomerID : Char(10), CustomerName:Varchar(100), EmailAddress : Varchar(30), TelephoneNumber: Number(15,0))

(a) Identify the relationships among tables.
(b) Identify the relation having composite primary key and its primary key.
(c) Write a SQL query to create table customerOrder. It should also define required primary key and foreign key(s)
(d) A fault has been identified with the furnitureID number 6281. The manager needs to known how many orders need to be recalled. Write a SQL query for the same.
(e) A customer with ID number 'C5104' wants to change his registered telephone number as 9988776655. Write a SQL query to achieve this.

9. Rachana Mittal runs a beauty parlor. She uses a database management system(DBMS) to store the information that she needs to manage her business. This information includes customer contact details, staff names, the treatments that the parlor offer (for example, ''Hair Massage') and appointment that customers have made for treatments. A separate appointment must be made for each treatment.
The details are stored in a database using the following four relations:
Customer: (CustomerID, FirstName, LastName, TelephoneNumber, EmailAddress)
Staff :(StaffID, FirstName,LastName, IsQualified)
Treatment: (TreatmentName,Price,TimeTaken,NeedsQualification)
Appointment : (CustomerID,TreatmentName,ApDate,ApTime)
• The IsQualifiedattribute for a member of staff stores one of the value True or False, to indicate if the member of staff is fully qualified or not.
• The NeedsQualifictionattribute for a treatment stores True or False to indicate if the treatment can only be given by a qualified member of staff.
• The TimeTakenattribute for a treatment is the number of minutes (a whole number) that the treatment takes.
(a) Write a SQL statement to create the table staff.
(b) Write a query to Insert a record in the table Staff with following data ; (2009, 'Sheril', 'Mark', 'True')
(c) Which table's records can be deleted without affecting any other table?
(i) Customer (ii) Staff (iii) Treatment (iv) Appointment
(d) Write a query to Modify table Appointment to add a new column StaffID, which should hold a legal StaffID value from the staff table.
(e) Rachana wants to send e-mail advertisement to all the customers who had a 'RF

Facial' treatmentin 2020. To send the email, the customer's email address, firstname and lastname are needed.

Write a SQL query to retrieve the email address, firstname and lastname of each customer to whom email should be sent.

RollNo	***Name***	***Class***	***DOB***	***Gender***	***City***	***Marks***
1	*Anand*	*XI*	*6/6/97*	*M*	*Agra*	*430*
2	*Chetan*	*XII*	*7/5/94*	*M*	*Mumbai*	*460*
3	*Geet*	*XI*	*6/5/97*	*F*	*Agra*	*470*
4	*Preeti*	*XII*	*8/8/95*	*F*	*Mumbai*	*492*
5	*Saniyal*	*XII*	*8/10/95*	*M*	*Delhi*	*360*
6	*Maakhiy*	*XI*	*12/12/94*	*F*	*Dubai*	*256*
7	*Neha*	*X*	*8/12/95*	*F*	*Moscow*	*324*
8	*Nishant*	*X*	*12/6/95*	*M*	*Moscow*	*429*

10. Consider the table STUDENT given below :

(a) State the command that will give output as:

Name
Anand
Chetan
Geet
Preeti

(i) Select Name from student where class= 'XI' and class='XII';
(ii) Select Name from student where not class= 'XI' and class='XII';
(iii) Select Name from student where city = 'Agra' or city = 'Mumbai';
(iv) Select Name from student where city IN('Agra' , 'Mumbai');

Choose the correct option :

(i) Both (i) and (ii)
(ii) Both (iii) and (iv)
(iii) any of the option (i) , (ii) and (iv)
(iv) Only (iii)

(b) What will be the output of the following command?

RollNo	***Name***	***Class***	***DOB***	***Gender***	***City***	***Marks***
4	*Preeti*	*XII*	*8/8/95*	*F*	*Mumbai*	*492*
3	*Geet*	*XI*	*6/5/97*	*F*	*Agra*	*470*

7	*Neha*	*X*	*8/12/95*	*F*	*Moscow*	*324*
6	*Maakhiy*	*XI*	*12/12/94*	*F*	*Dubai*	*256*

(i)

(ii)

RollNo	***Name***	***Class***	***DOB***	***Gender***	***City***	***Marks***
6	*Maakhiy*	*XI*	*12/12/94*	*F*	*Dubai*	*256*
7	*Neha*	*X*	*8/12/95*	*F*	*Moscow*	*324*
3	*Geet*	*XI*	*6/5/97*	*F*	*Agra*	*470*
4	*Preeti*	*XII*	*8/8/95*	*F*	*Mumbai*	*492*

(iii)

Gender	***Marks***
F	*256*
F	*324*
F	*470*
F	*492*

Gender	***Marks***
F	*492*
F	*470*
F	*324*
F	*256*

(iv)

(c) Prachi has given the following command to obtain the highest marks.

SELECT max(Marks) from student where group by class;

But she is not getting the desired result. Help her by writing the correct command.

(a) Select max(Marks) from student where group by class;
(b) Select class, max(Marks) from student group by Marks;
(c) Select class, max(Marks) group by class from students;
(d) Select class, max(Marks) from student group by class;

(d) State the command to display the average marks scored by students of each gender who are in class XI?

(a) Select Gender, avg(Marks) from student where class= 'XI' group by gender;
(b) Select Gender, avg(Marks) from student group by gender where class= 'XI';
(c) Select Gender, avg(Marks) group by Gender from student having class= 'XI';
(d) Select Gender, avg(Marks) from student group by Gender having class= 'XI';

Choose the correct option:

i. Both (ii) and (iii)

ii. Both (ii) and (iv)

iii. Both (i) and (iii)

iv. Only (iii)

(e) Help Ritesh to write the command to display the name of the youngest student.
(a) Select Name, min(DOB) from student;
(b) Select Name, max(DOB) from student;
(c) Select Name, min(DOB) from student group by Name;
(d) Select Name, maximum(DOB) from student;

SOLUTIONS

1	(b) Key	2	(d) All of these	3	(b) Primary Key	4	(c) Candidate Key
5	(a) Key	6	(d) Street	7	(b) Primary	8	(d) ID
9	(b) QAL	10	(b) ALTER	11	(b) SELECT DISTINCT	12	(c) Distinct
13	(a) where	14	(b) LIKE	15	(a) BETWEEN	16	(b) SELECT
17	(d)	18	(a) Misha, Khushi	19	(b) LIKE	20	(d) %
21	(c) IS Operator	22	(a) Order By	23	(d) Ascending	24	(c) Desc, Asc
25	(d)	26	(a) ALTER TABLE	27	(d) All of these	28	(c)
29	(a) Unique	30	(b) DML	31	(a)	32	(c)
33	(a)	34	(a) and (c)	35	(b) Primary Key	36	(c)
37	(b)Foreign Key	38	(c)99.99	39	(c) NUMBER(5,2)	40	(b) column Name
41	(b) Data	42	(b)Count(*)	43	(b)And (c)	44	(b)And (c)

MULTIPLE CHOICE QUESTION

1	FROM	2	SELECT	3	DISTINCT	4	ASTRIK(*)
5	WHERE	6	LIKE	7	BETWEEN	8	IS NULL
9	ORDER BY	10	DESC	11	ASCENDING	12	USE
13	CREATE TABLE	14	CONSTRAINT	15	REFERENCES	16	PRIMARY KEY
17	INSERT INTO	18	DELETE	19	ALTER TABLE	20	DROP TABLE
21	ALTER TABLE	22	DROP TABLE	23	ALTER TABLE	24	NULL
25	COMMIT	26	GROUP BY	27	HAVING	28	AGGREGATE
29	MULTIPLE FIELDS	30	HAVING	31	WHERE	32	SUM()
33	AVG()	34	MAX()	35	MIN()	36	COUNT()
37	SINGLE ROW	38	HAVING				

FILL IN THE BLANKS

1	False	2	False	3	True	4	True
5	False	6	True	7	True	8	False
9	False	10	False	11	True	12	False
13	False	14	True	15	False	16	False
17	False	18	False	19	True	20	True
21	False	22	False	23	False	24	False
25	False	26	True	27	False	28	False
29	True	30	False				

TRUE FALSE QUESTIONS

VERY SHORT ANSWER QUESTIONS (1 MARKS EACH)

Q.N.	ANS	Q.N.	ANS	Q.N.	ANS
1	**order by clause**	2	Insert , Delete	3	SQL is structured query language. It is a standard language of all the RDBMS
4	A field which is unique for each and every record in table is called primary key.	5	show tables;	6	Alter
7	Update	8	Delete	9	Drop

10	Create —DDL and Delete —-DML	11	Group by	12	Those fields which can act as primary key is called candidate key.
13	Select * from RECORD where Rname like %math%;	14	Ans. It returns the largest value from a particular column.	15	Number of columns in table is called degree. Number of rows in a table is called cardinality.
16	Ans. DDL – Data Definition Language, DML – Data Manipulation Language.	17	Update	18	Desc
19	sum()	20	Having clause can be used with group by clause while where clause can be used without group by clause.	21	avg()
22	“Like” operator is used to match a particular pattern in a particular column in SQL.	23	Delete from data	24	A function which perform calculation on multiple values and return single value.
25	% and underscore(_)	26	Redundancy	27	Char is fixed length data type and varchar is variable length data type.

SHORT ANSWER QUESTIONS (2 MARKS EACH)

1. Degree - The number of attributes or columns in a relation is called the Degree of the relation.
Cardinality - The number of tuples/ rows in a relation is called the Cardinality of the relation.

2. WHERE clause is used to select particular rows that satisfy a condition whereas HAVING clause is used in connection with the aggregate function, GROUP BY clause.
For ex. – select * from student where marks > 75;

This statement shall display the records for all the students who have scored more than 75 marks. On the contrary, the statement – select * from student group by stream having marks > 75; shall display the records of all the students grouped together on the basis of stream but only for those students who have scored marks more than 75.

3. Primary Key- one or more attribute of a relation used to uniquely identify each and every tuple in the relation. For Example : In the below Table Student, RollNo can be the Primary Key RollNo Name Marks

1 Pratham 75

2 Srishti 80

4. { } and fetchone()

5. DDL- Data definition language. Consists of commands used to modify the metadata of a table. For Example- create table, alter table, drop table

DML-Data manipulation language. Consist of commands used to modify the data of a table. For Example- insert, delete, update

6.

i) import mysql.connector

ii) It is the object that helps to execute the SQL queries and facilitate row by row processing of records in the resultset.

7. Domain of an attribute is the set of values from which a value may come in a column. E.g. Domain of section field may be (A,B,C,D).

8. fetchone() is used to retrieve one record at a time but fetchmany(n) will fetch n records at a time from the table in the form of a tuple.

9. Constraints are the checking condition which we apply on table to ensure the correctness of data . Example primary key, not null, default, unique etc

10. import mysql.connector as mydb

conn= mydb.connect(host="localhost", user="root", passwd="1234") cur=conn.cursor()

cur.execute("INSERT INTO student values(10,'Ashok',26);") cur.commit()

11. A table may have more than one such attribute/group of attributes that identifies a tuple uniquely, all such attribute(s) are known as Candidate Keys. All the candidate key except

primary key are called Alternate key.

Table: Employee (empno, aadhar_no, voter_id, ename, deptno, sal, city)

In the above table Employee, empno,aadhar_no, voter_id all are candidate key If we define empno as primary key then remaining candidate keys will be alternate key.

12. RDBMS stands for Relational Database Management System. It is a program that offers commands to create, update, and manage the data with multiple tables. Examples of RDBMS are

1. MySQL
2. Oracle
3. Microsoft SQL Server.

13.

i) Order By : This clause is used to arrange the records in ascending or descending order. for example Select * from book order by price;

ii) Having : HAVING Clause in SQL is used to specify conditions on the rows with GROUP BY clause. for example Select sum(price) from book group by (subject) having price > 100;

CASE STUDY BASED QUESTIONS (3 MARKS EACH)

ANS .1 (i) 4 (ii) 6000 (iii) 12500

Ans.2

(i)	Count(*)	CITY
	3	DELHI
	2	MUMBAI
	1	MADRAS

(ii) MIN (PRICE) -50000 MAX (PRICE) -7000

(iii) AVG (QTY) 11

Ans.3

(i) Quarter	sum(qty_sold)	
1	15	
2	30	
3	45	
4	15	
(ii) watch_name	price	type
HighFashion	7000	Unisex

(iii)

watch_name	qty_store	qty_sold	Stock
HighTime	100	25	75
LifeTime	150	40	110
Wave	200	30	170
GoldenTime	100	10	90

Ans4.

(i) Manager 3

Clerk 3

(ii) 80000 28000

(iii) Ravi Kumar Robert Samuel Ritu Tondon Rachel Lee

Ans5.

(i) 3 (ii)650 (iii)TDH

CASE STUDY BASED QUESTIONS (5 MARKS EACH)

1.

(a) Select Name From GRADUATE Where DIV = 1 Order by Name;

(b) Select Name, stipend, subject, stepend *12 From GRADUATE

(c) Select count (*) From GRADUATE
where subject IN (“PHYSICS”, “COMPUTER SC”);

(d) insert into GRADUATE Values (11, “KAJOL”, 300, “COMPUTER SC”, 75,1);

(e) Select name from Graduate where average>65;

2.

(a) Select * From CLUB Where sports = “SWIMMING”;

(b) Select COACHNAME From CLUB order by DATOFAPP desc

(c) Select coachname, pay, age, 0.15 * pay From CLUB;

(d) Insert into CLUB Values (11, “PRAKASH”, 37, “SQUASH”, {25/02/98], 2500, “M”);

(e) Select Coachname ,Sports,Pay from Club .

3.

(a) Select * From INTERIORS Where TYPE = “Sofa”;

(b) Select ITEMNAME From INTERIORS where PRICE > 10000;

(c) Select ITEMNAME, TYPE From INTERIORS where DATEOFSTOCK < {22/01/02} Order by ITEMNAME desc;

(d) Select ITEMNAME, DATEOFSTOCK From INTERIORS Where DISCOUNT > 15;

(e)Select Count (*) From INFERIORS Where TYPE = “Double Bed”;

4.

(a) Select * From FURNITURE Where TYPE = “Baby cot”;

(b) Select ITEMNAME From FURNITURE Where PRICE > 15000;

(c) Select ITEMNAME, TYPE From FURNITURE where DATEOFSTOCK < {22/01/02} Order by ITEMNAME desc;

(d) Select ITEMNAME, DATEOFSTOCK From FURNITURE Where DISCOUNT > 25.

(e) Insert Into ARRIVALS Values (14, “Velvet touch”, “Double bed”,{25/03/03}, 25000,30);

5.

(a) SELECT * FROM Teacher WHERE Department = “History”;

(b) SELECT Name FROM Teacher WHERE Department = “Hindi” and Sex = “F”;

(c) SELECT Name, Dateofjoin FROM Teacher ORDER BY Dateofjoin;

(d) SELECT Name, Salary, Age FROM Teacher WHERE Age > 23 AND Sex = ‘M’;

(e) SELECT COUNT (*) FROM Teacher where Age > 23;

6.

(a) (iii) Loan Table

(b) I. (i) Book : Title (ii) Member: EmailID

(c). No, the Loan relation cannot have alternate key as its primary key is a composite key having foreign key.

(d) INSERT INTO Loan Values(‘M1255’, ‘B3100’, ‘02/02/2020’, ‘09/02/2020’, False)

(e) Select FirstName, LastName, EmailID From Member, Loan
Where Member.MemberID=Loan.MemberID AND Returned = ‘False’;

7.

(a) Foreign Keys in Relation Loan MemberID(Parent Table Member) BookID (Parent Table Book)

(b) Yes, a relation can have multiple foreign keys, e.g., the loan relation given above has two foreign keys – MemberID and BookID

(c) Yes, a foreign key can be a part of composite primary key, e.g., the primary key of relation loan is : (MemberID, BookID, LoanDate), which contains two foreign keys : MemberID and BookID.

(d) Select FristName,LastName, EmailID From Member, Loan Where Member.MemberID=Loan.MemberID AND EmailID LIKE “%@kvs.in” AND Returned = ‘False’;

8.

(a)

Table	Related to table (Key)
CustomerOrder	Customer(CustomerID)
CustomerOrderLine	CustomerOrder(OrderID)
CustomerOrderLine	Furniture (FurnitureID)

(b) CustomerOrderLine(OrderID, FurnitureID)

(c) Create Table CustomerOrder
(OrderIDNumber(8,0) Not Null Primary Key,
CustomerIDchar(ID) REFERENCE Customer(CustomerID),
OrderDate Date);

(d) Select count(*)
From CustomerOrderLine Group
by FurnitureID
Having FurnitureID = ‘6281’;

(e) Update Customer
Set TelephoneNumber=9988776655 Where
CustomerID= ‘C5104’;

9.

(a) Create Table Staff

(StaffID Number(4,0) NOT NULL PRIMARY KEY,

FirstName Varchar(20) NOT NULL, LastNameVarchar(20),

ISQualifiedChar(4) Check (IsQualified IN(‘True’, ‘False’)));

(b) INSERT INTO Staff Values(2009, ‘Sheril’, ‘Mark’, ‘True’);

(c) (ii) Staff table’s records can be deleted without affecting any other table as of now, because this table is not linked with any other table yet.

(d) Alter Table Appointment Add StaffIDNumber(4,0) NOT NULL Reference Staff(StaffID);

(e) Select EmailAddress, FirstName,LastName From Customer C, Appointment A

Where C.CustomerID=A.CustomerID AND TreatmentName= ‘RF Facial’;

10.

(i) (b) Both (iii) and (iv)

(ii) (b)

(iii) (d)

(iv) (b) Both (ii) and (iv)

(v) (b)

Class XII Session 2022-23
Computer Science (083)
Sample Question Paper Blueprint

Topics	1 Mark	2 Mark	3 Mark	4 Mark	5 Marks	Total Marks
Revision of Python topics covered in Class XI	7	1+1(or)			⅖ (or)	9+4(or)
Functions:	1	2	1		⅖	10
Text file	2		1+1(or)			5+3(or)
Binary File				1		4
CSV file	1				1+1(or)	6+5(or)
Data Structure:			1+1(or)			3+3(or)
Data communication terminologies		1				2
Network topologies and Network types/Network Devices					1	5
Network protocol:	1	1				3
Introduction to web services:		1 (or)				2(or)
Relational data model	1	1				3
SQL	4	1+1(or)	2	1+2(or)		16+10(or)
Interface of python with an SQL database	1				⅗ + ⅗ (or)	4+3(or)
Total Questions	**18**	**7+3 (or)**	**5+2(or)**	**2+2(or)**	**3+2(or)**	
Total Marks	**18**	**14+6(or)**	**15+6(or)**	**8+8(or)**	**15+10(or)**	**70+30(or)**

केन्द्रीय विद्यालय संगठन
Kendriya Vidyalaya Sangathan
Regional Office Raipur
Class XII, SESSION 2022-23
Computer Science (083)
Sample Question Paper (Theory)

Maximum Marks: 70 **Time allowed: 03 Hours**

General Instructions:

1. This question paper contains five sections, Section A to E.
2. All questions are compulsory.
3. Section A has 18 questions carrying 01 mark each.
4. Section B has 07 Very Short Answer type questions carrying 02 marks each.
5. Section C has 05 Short Answer type questions carrying 03 marks each.
6. Section D has 03 Long Answer type questions carrying 05 marks each.
7. Section E has 02 questions carrying 04 marks each. One internal choice is given in Q34 against part (iii) only.
8. All programming questions are to be answered using Python Language only.

****

SECTION A		
QNo	**Question**	**Mark**
1	State True or False "Python is a case insensitive language."	1
2	Which of the following is not a supported operation in Python? (a) **"xyz"+ "abc"** (b) **(2)+(3,)** (c) **2+3** (d) **[2,4]+[1,2]**	1
3	Identify the output of following code **d={'a':'Delhi','b':'Mumbai','c':'Kolkata'}** **for i in d:** ** if i in d[i]:** ** x=len(d[i])** ** print(x)** (a) 6 (b) 0 (c) 5 (d) 7	1
4	Consider a tuple t=(2, 4, 5), which of the following will give error? (a) **list(t)[-1]=2** (b) **print(t[-1])** (c) **list(t).append(6)** (d) **t[-1]=7**	1
5	Given a List **L=[7,18,9,6,1]**, what will be the output of **L[-2::-1]?** (a) [6, 9, 18, 7] (b) [6,1] (c) [6,9,18] (d) [6]	1

6	A text file “TFile.txt" is stored on a computer. Identify the correct option out of the following options to open the file for reading **i. myfile = open('student.txt','r+')** **ii. myfile = open('student.txt','r')** **iii. myfile = open('student.txt','rb')** **iv. myfile = open('student.txt')** (a) (i), (ii) and (iv) (b) (ii) and (iv) (c) (ii),(iii) and (iv) (d) (i), (ii) and (iii)	1
7	Consider the following table description of a table study. +-------+----------+------+-----+---------+-------+ | Field | Type | Null | Key | Default | Extra | +-------+----------+------+-----+---------+-------+ | roll | int(11) | NO | PRI | NULL | | | name | char(30) | YES | | NULL | | | mark | int(11) | NO | | 10 | | +-------+----------+------+-----+---------+-------+ Which of the following is false based on this description? (a) The values of the roll column will never be repeated. (b) The mark column will always take a value equal to 10. (c) Name column may take NULL values. (d) The roll column will never take NULL values.	1
8	Which clause in SQL is used to print only unique values of a column? (a) alter (b) unique (c) unique_value (d) distinct	1
9	Predict the output: **tup1 = (2,4,[6,2],3)** **tup1[2][1]=7** **print(tup1)** (a)Error (b) (2,4,[6,2],3) (c)(2,4,[6,7],3) (d)(2,4,6,7,3)	1
10	A table has 5 rows and 3 columns. A new row is added to it. What will be its cardinality and degree? (a)5, 4 (b) 6, 3 (c)6, 4 (d)5, 3	
11	Suppose the content of Python.txt file is *I am studying Python programming.* What will be the output of the following Python code? **f=open('Python.txt')** **f.seek(12)** **print(f.read(8))** (a) ng Python (b)g Python p (c) ng Pytho (d) g Python	1
12	Use of —--- command in SQL is equivalent to combining multiple conditions using OR clause.	1

	(a) in (b) not null (c) having (d) describe	
13	—-- protocol is used when we browse different web pages of a website. (a) SMTP (b) VoIP (c) HTTP (d) POP3	1
14	The below given expression will evaluate to **22//5+2**2**3%5** (a)5 (b) 10 (c) 15 (d) 20	1
15	Which of the following SQL command will find sum of all the values of mark columns (a)count(mark) (b) total(mark) (c) aggregate(mark) (d) sum(mark)	1
16	Which of the following is the correct set of commands for installing and importing mysql connector, respectively? (a) pip install mysql.connector import mysql.connector (b) pip install mysql-connector import mysql.connector (c) pip install mysql-connector import mysql-connector (d) pip install mysql.connector import mysql-connector	1
	Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as (a) Both A and R are true and R is the correct explanation for A (b) Both A and R are true and R is not the correct explanation for A (c) A is True but R is False (d) A is false but R is True	1
17	Assertion (A):- A function header has been declared as **MYFUNCTION(A, B=30)** The function call **MYFUNCTION(20, 60, B=80)** will give an error. Reasoning (R):- During a function call, the same parameter should not be provided two values.	1
18	Assertion (A):- The writerow function of csv module takes a list having length equal to the number of columns in CSV file. Reasoning (R):- The data inside a CSV file is stored in the form of a string.	1
	SECTION B	
19	Predict the output of the following code? **def my_func(a=10,b=30):** **a+=20** **b-=10** **return a+b,a-b** **print(my_func(a=60)[0],my_func(b=40)[1])**	2
20	Write any two features of the packet switched network. **Or**	2

	Explain the meaning of terms Hypertext and Markup in HTML language.	
21	(a) If **S=”Pythonlanguage”** Predict the output of **print(S[:-6:-2])** (b) Predict the output of **d={2:'b',4:'c'}** **d1={1:'a'}** **d.update(d1)** **d[1]='v'** **print(list(d.values()))**	1 1
22	Explain two points of difference between Primary key and Alternate key in a Relational Data Model.	2
23	(a) Expand the following: (i) POP3 (ii) HTTPS (b) What is the use of POP3 protocol?	2
24	Predict the output of below given Python code: **def MYFUNCTION():** **a=10** **global vr** **vr=0** **vr+=a** **print(vr,end=' ')** **MYFUNCTION()** **vr=12** **print(vr)** **Or** Predict the output of below given Python code: **tuple1 = (5, 12, 7, 4, 9 ,6)** **list1 =list(tuple1)** **list1.insert(2,8)** **list1.pop()** **tuple1=tuple(list1)** **print(tuple1)**	2
25	There is a column mark in the table student. The following two statements are giving different outputs. What may be the possible reason? **select count(*) from student;**	2

	select count(mark) from student; **or** Snita created the following table named myschool. Consider the below given scenarios and write appropriate SQL queries for the same. +-------+----------+------+-----+---------+-------+ | Field | Type | Null | Key | Default | Extra | +-------+----------+------+-----+---------+-------+ | admno | int(11) | YES | | NULL | | | name | char(30) | YES | | NULL | | +-------+----------+------+-----+---------+-------+ (i) She forgot to make admno attribute as the Primary key. Write the SQL Query to make admno as the Primary key after the table has been created. (ii) She now wants to add a new column mark of integer data type and having default value equal to 0. Write SQL query to do so.	
	SECTION C	
26	Consider the School and Location table Table: School +------+-------+------+ | roll | name | mark | +------+-------+------+ | 1 | Akash | 90 | | 2 | Namit | 95 | | 3 | Anit | 87 | | 4 | Anuj | 88 | +------+-------+------+ Table: Location +------+-------------+ | roll | city | +------+-------------+ | 1 | Khairagarh | | 2 | Durg | | 3 | Rajnandgaon | | 4 | Khairagarh | +------+-------------+ (a) What will be the output of **select * from School natural join Location;** (b) Write the output of the queries (i) to (iv) based on the table, School and Location: **(i) select distinct(city) from location;** **(ii) select s.name,l.city from school as s,location as l where s.roll=l.roll and l.city like "%h";**	1+2

	(iii) select l.city,avg(s.mark) from school as s,location as l where s.roll=l.roll and l.city='khairagarh'; **(iv) select city,count(*) from location group by city having count(*)=1;**	
27	Write a function COUNTTEXT( ), which reads a text file Book.txt and displays all the words of the file whose length is more than 3 or those which start with 'A' or 'a' in the form of a list. For example, if the Book.txt file contains ***India is my country. They are studying.*** then the output should be: **["India", "country", "They", "are", "studying"]** **or** Write a function COUNWORD( ), which counts all the words from the text file Book.txt whose second last character is 'r' For example, if the Book.txt file contains ***India is my country. They are studying.*** then the output should be: 2	3
28	(a) Write the outputs of the SQL queries (i) to (iv) based on the relations Teacher and Placement given below: Table : Teacher 	T_ID	Name	Age	Department	Date_of_join	Salary	Gender
---	---	---	---	---	---	---
1	Arunan	34	Computer Sc	2019-01-10	12000	M
2	Saman	31	History	2017-03-24	20000	F
3	Randeep	32	Mathematics	2020-12-12	30000	M
4	Samira	35	History	2018-07-01	40000	F
5	Raman	42	Mathematics	2021-09-05	25000	M
6	Shyam	50	History	2019-06-27	30000	M
7	Shiv	44	Computer Sc	2019-02-25	21000	M
8	Shalakha	33	Mathematics	2018-07-31	20000	F | Table : Placement | P_ID	Department	Place
1	History	Ahmedabad
2	Mathematics	Jaipur
3	Computer Sc	Nagpur	 (i) SELECT Department, count(*) FROM Teacher GROUP BY Department having count(*)<3; (ii) SELECT MAX(Age),MIN(Age) FROM Teacher; (iii) SELECT Name, Age, T.Department, Place FROM Teacher T, Placement P WHERE T.Department = P.Department AND Place="Jaipur"; (iv) SELECT Gender, count(*) FROM Teacher GROUP BY Gender order by count(*) desc; (b) Write the command to see the data types of all the columns of the table Teacher.	3

29	Write a function GENERATE_INDEX(L), where L is the list of elements passed as argument to the function. The function returns another list named 'NewIndex' that stores the indices of all even Elements of L. For example: If L contains [22,7,9,24,6,5] The NewIndex will have - [0, 3, 4]	3
30	Write a Python function CREATESTACK(L), which should create two lists SO and SE from the list L containing integers. The stack SO should contain all the odd elements of the list L, and the stack SE should contain all the even elements of the list L. Also, write a function POPSTACK( ) which should pop and print all the elements of the stack SE, and print stack empty at the end. For example, if the list L is **[2,7,9,15,14]** Then SO should be **[7,9,15]** SE should be **[2,14]** Output of POPSTACK( ) function should be **14 2 Stack Empty** **or** Write a Python function MYSTACK(d), which should accept a dictionary d of the form roll : name as argument. The function should create a stack MYNAME having all the names containing 's' or 'S'. Also, write a function POPSTACK( ) which should pop and print all the elements of the stack MYNAME, and print stack empty at the end. For example, if the dictionary d is {1: 'Sunil', 2:'Naman', 3:'Anish'} Then MYNAME should be **['Sunil', 'Anish']** Output of POPSTACK( ) function should be **Anish Sunil Stack Empty**	3
	SECTION D	
31	Ionex Private Ltd. Patna has different divisions Marketing (A1), Sales (A2), Finance (A3) and Production (A4). The company has another branch in New Delhi. The management wants to connect all the divisions as well as all the computers of each division (A1, A2, A3, A4) of Patna branch. Distance between the divisions are as follows : A3 to A1: 20 m A1 to A2: 35 m A2 to A4: 20 m A4 to A3: 130 m A3 to A2: 1000 m A1 to A4: 190 m The number of computers in each division is as follows : A1: 50 A2: 40 A3: 110 A4: 60 Based on the above configurations, answer the following questions :	5

	(i) Suggest the type of network (PAN, LAN, MAN, WAN) required to connect the Finance (A3) division with the New Delhi branch by giving suitable reasons. (ii) Suggest the placement of following devices (a) Switch (b) Repeater (iii) Suggest the division which should be made server by quoting suitable reasons. (iv) The company wants to conduct an online video conference between employees of the Patna and New Delhi branches. Name the protocol which will be used to send voice signals in this conference. (v) Suggest the topology and draw the most suitable cable layout for connecting all the divisions of the Patna branch.	

32	(a)
	Identify the output of following Python code
	
	s="Python"
	def MODIFY(T):
	T="World"
	print(T,end="#")
	return T[:-3:-1]
	print(MODIFY(s))
	
	(b) Consider the below given SCHOOL table and predict the output of Python program based on this table:
	
	+------+-------+------+
	| roll | name | mark |
	+------+-------+------+
	| 1 | Akash | 90 |
	| 2 | Namit | 95 |
	| 3 | Anit | 87 |
	| 4 | Anuj | 88 |
	+------+-------+------+
	
	`import mysql.connector as con`
	`mydb=con.connect(host="localhost",user="root",password="1234",\`
	`database="db1")`
	`mycursor=mydb.cursor()`
	`mycursor.execute("select * from school where name like 'A%'")`
	`record=mycursor.fetchone()`
	`for i in range(2):`
	`record=mycursor.fetchone()`
	`print(record[0],record[1])`
	`print(mycursor.rowcount)`
	
	or
	
	(a) Predict the output of below given Python code:
	
	s="Abc2@xYz"
		2+3

```
m=""
for i in range(len(s)):
 if s[i].isupper():
    m+=s[i].lower()
 elif s[i].islower():
    m+=s[i].upper()
 elif s[i].isdigit():
    m+=s[i-1]
 else:
    m = m +'#'
print(m)
```

(b) Consider the below given LOCATION table and predict the output of Python program based on this table:

roll	city
1	Khairagarh
2	Durg
3	Rajnandgaon
4	Khairagarh

```
import mysql.connector as con
mydb=con.connect(host="localhost",user="root",\
                 password="1234",database="db1")
mycursor=mydb.cursor()
mycursor.execute('select * from location where city in ("Durg","Rajnandgaon")')
for x in mycursor:
    print(x[-1])
    print(mycursor.rowcount)
```

33 Write one application of a csv file. A csv file Employee.csv has three columns [EmpID, Name, Salary]. 5

(i) Write a user defined function **writecsv(L)** which accepts a list L from the user containing EmpID, Name, Salary and write it to the csv file Employee.csv.

(ii) Write a function **readcsv(name)**which accepts the employee name as parameter and prints the salary of that employee.

or

Write one advantage of binary file over csv file. A csv file Shop.csv has three columns [ItemID, Item, Amount].

(i) Write a user defined function **countcsv()** which counts the number of items in the csv file whose amount exceeds Rs 1000.

(ii) Write a function **searchcsv(Item)**which accepts the Item name as parameter and prints the amount of that Item.

SECTION E

34 Consider the below given ITEM table: 1+1+2

Table : **ITEM**

SNo	Itemname	Type	Price	Stockdate
1	Chaises	Living	11500.58	2020-02-19
2	Accent Chairs	Living	31000.67	2021-02-15
3	Baker Racks	Kitchen	25000.623	2019-01-01
4	Sofa	Living	7000.3	2020-10-18
5	Nightstand	Bedroom	NULL	2021-07-23

Write SQL queries for the following:

I. Display Kitchen and Living items in descending order of Price

II. Display the average price for each Type.

III. (a) Display the Stockdate for recently added item.

(b) Display the Itemname whose name ends with 's'.

OR (Option for part iii only)

III (a) Delete the Item having price less than 10000.

(b) Update the price of item having NULL price to 1000.

35 Ahana is writing a program to create a binary file Employee.dat which will contain Empcode and Salary for some employees. She has written the following code. As a programmer, help her to successfully execute the given task 4

(i) Name the module she should import in Line1.
(ii) In which mode, she should open the file in Line2 to add data into the file.
(iii) Fill in the blank in Line3 to read data from the binary file.
(iv) Write the output she will obtain while executing Line4.

```
import _______ as p    #Line1
def AddBinary(Empcode,Salary):
    f=open("Employee.dat",___) #Line2
    p.dump([Empcode,Salary],f)
    f.close()

def ReadBinary():
    f=open("Employee.dat","rb")
    try:
        while True:
            record=_______#Line3
            if record[0][-1]=='a':
                print(record[0],record[1])
    except:
        f.close()

AddBinary('Anaya',30000)
AddBinary('Aman',40000)
AddBinary('Neha',70000)
ReadBinary()#Line4
```

****

Dr. Amarnath Pathak
PGT CS, KV Khairagarh

केन्द्रीय विद्यालय संगठन
Kendriya Vidyalaya Sangathan
Regional Office Raipur
Class XII, SESSION 2022-23
Computer Science (083)
Marking Scheme

Maximum Marks: 70 **Time allowed: 03 Hours**

SECTION A		
QNo	**Question**	**Mark**
1	False	1
2	(b) **(2)+(3,)**	1
3	(a) 6	1
4	(d) **t[-1]=7**	1
5	(a) [6, 9, 18, 7]	1
6	(a) (i), (ii) and (iv)	1
7	(b) The mark column will always take a value equal to 10.	1
8	(d) distinct	1
9	(c)(2,4,[6,7],3)	1
10	(b) 6, 3	
11	(d) g Python	1
12	(a) in	1
13	(c) HTTP	1
14	(a)5	1
15	(d) sum(mark)	1
16	(b) pip install mysql-connector import mysql.connector	
	Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as (a) Both A and R are true and R is the correct explanation for A (b) Both A and R are true and R is not the correct explanation for A (c) A is True but R is False (d) A is false but R is True	
17	(a)	

18	(b)	
	SECTION B	
19	**100 0**	2
20	(i) The data is transmitted in the form of packets. (1 Mark) (ii) No prior connection setup is needed. (1 Mark) Any other suitable feature. **Or** Hypertext means that HTML contains some text which has directive property i.e. by clicking on such texts, we get redirected to some other webpages. (1 Mark) Markup means that HTML contains some pre-defined tags which have some specific purpose. (1 Mark)	2
21	(a) eag (1 Mark) (b) ['b', 'c', 'v'] (1 Mark)	1 1
22	Primary key is an attribute or set of attributes of a table which always takes unique and not null values. Alternate key is one of the candidate keys which is not chosen as primary key. A table will have only one primary key whereas it may have more than one Alternate key.	2
23	(a)POP3: Post Office Protocol Version 3 HTTPS: HyperText Transfer Protocol Secure (½ Mark for each correct answer) (b) POP3 protocol is used for receiving emails. It can operate in two modes: keep and delete. (1 Mark)	2
24	10 12 (2 Mark) **Or** (5, 12, 8, 7, 4, 9) (2 Mark)	2
25	The two will be giving different outputs because the mark column will be taking NULL values. Since count(*) functions will count NULL values and count(mark) will not count NULL values, hence the two are giving different outputs. (2 Marks) **or** (i) alter table myschool add primary key (roll); (1 Mark) (ii) alter table myschool add mark int default 0; (1 Mark)	2

	SECTION C	
26	(a) roll | name | mark | city | +------+-------+------+-------------+ | 1 | Akash | 90 | Khairagarh | | 2 | Namit | 95 | Durg | | 3 | Anit | 87 | Rajnandgaon | | 4 | Anuj | 88 | Khairagarh (b) **(i)** **Khairagarh** **Durg** **Rajnandgaon** **(ii)** **Akash Khairagarh** **Anuj Khairagarh** **(iii)** **khairagarh 89.0** **(iv)** **Durg 1** **Rajnandgaon 1**	1+2
27	**def COUNTTEXT():** **f=open("Book.txt")** **L=[]** **content=f.read()** **data=content.split()** **for word in data:** **if (len(word)>3) or (word[0].lower()=='a'):** **L.append(word)** **print(L)** **or** **def COUNTWORD():** **f=open("Book.txt")** **C=0** **content=f.read()** **data=content.split()** **for word in data:** **if word[-2]==’r’:** **c+=1** **print(“Count is:”,c)**	3

28	(a) (i) Computer Sc 2 (ii) 50 31 (iii) Randeep 32 Mathematics Jaipur Raman 42 Mathematics Jaipur Shalakha 33 Mathematics Jaipur (iv) M 5 F 3 (b) desc Teacher	3
29	**def GENERATE_INDEX(L):** **NewIndex=[]** **for i in range(len(L)):** **if L[i]%2==0:** **NewIndex.append(i)** **print(NewIndex)** **GENERATE_INDEX([22,7,9,24,6,5])**	3
30	**SO,SE=[],[]** **def CREATESTACK(L):** **for i in L:** **if i%2==0:** **SE.append(i)** **else:** **SO.append(i)** **def POPSTACK():** **for i in range(len(SE)):** **print(SE.pop(),end=' ')** **print("Stack Empty")** **CREATESTACK([1,2,4,6,7,9,13])** **print("SO is: ",SO)** **print("SE is: ",SE)** **POPSTACK()** Output:	3

	SO is: [1, 7, 9, 13] **SE is: [2, 4, 6]** **6 4 2 Stack Empty** **or** **MYNAME=[]** **def MYSTACK(d):** **for i in d:** **if 's' in d[i].lower():** **MYNAME.append(d[i])** **def POPSTACK():** **for i in range(len(MYNAME)):** **print(MYNAME.pop(),end=' ')** **print('Stack Empty')** **MYSTACK({1: 'Sunil', 2:'Naman', 3:'Anish'})** **POPSTACK()**	
	SECTION D	
31	(i) WAN, since the distance between the two is very large. (ii) switch in all the divisions for creating LAN. Repeater between A3 to A2 and A3 to A3 to A4 as the distance exceeds 90m. (iii) A3, as the number of computers is very large. (iv) VoIP (Voice Over Internet Protocol) (v) Bus A3—-20m—-----A1—---35m—------A2—----20m—----A4	5
32	(a) World#dl (b) Anit 87 (1 Mark) Anuj 88 (1 Mark) 3 (1 Mark) **or**	2+3

	(a) aBCc#XyZ (b) Durg 1 Rajnandgaon 2	
33	A csv file is widely used in data anal;ysis because of its strcucterd nature. **import csv** **def writecsv(L):** **f=open(**'Employee.csv'**,'a',newline='')** **c=csv.writer(f)** **c.writerow(L)** **def readcsv(name):** **f=open(**'Employee.csv'**,'r')** **content=csv.reader(f)** **for record in list(content):** **if record[1]==name:** **print(record[-1])** **writecsv([101,'Aman',90000])** **writecsv([102,'Akash',80000])** **readcsv("Akash")** **or** Binary file retains the data type of the data being written to the file, while the csv file converts the data being written to string format. **def countcsv():** **c=0** **f=open('Shop.csv','r')** **content=csv.reader(f)** **for record in list(content):** **if int(record[-1])>1000:** **c+=1** **print(c)** **def serachcsv(Item):** **f=open('Shop.csv','r')** **content=csv.reader(f)** **for record in list(content):** **if record[1]==Item:** **print(record[-1])**	5
	SECTION E	
34		1+1+2

	I. select * from ITEM where Type in (“Kitchen”, ”Living”) order by Price desc; II. select Type, avg(Price) from ITEM group by Type; III. (a) select max(Stockdate) from ITEM’; (b) select Itemname from ITEM where Itemname like “%s”; or (a) delete from ITEM where price<10000; (b) update ITEM set price=1000 where price is null;	
35	(i) pickle (ii) ‘ab’ (iii) p.load(f) (iv) Anaya 30000 Neha 70000	4

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SET-1

KENDRIYA VIDYALAYA SANGATHAN, RAIPUR REGION

Class- XII Computer Science (083)

(2022-23)

Maximum Marks: 70 **Time Allowed: 3 hours**

General Instructions:

1. This question paper contains five sections, Section A to E.
2. All questions are compulsory.
3. Section A have 18 questions carrying 01 mark each.
4. Section B has 07 Very Short Answer type questions carrying 02 marks each.
5. Section C has 05 Short Answer type questions carrying 03 marks each.
6. Section D has 03 Long Answer type questions carrying 05 marks each.
7. Section E has 02 questions carrying 04 marks each. One internal choice is given in Q35 against part c only.
8. All programming questions are to be answered using Python Language only.

	Section A	
1.	Find the invalid identifier from the following a) KVS_Jpr b) false c) 3rdPlace d) _rank	1
2.	Consider a string **t = "hello"** . Identify the statements that will result in an error. **i. print (t(0))** **ii. print(min(t))** **iii. t[3]= 'k'** **iv. print (max(t))** a. only ii b. both ii and iv c. iii d. both ii and iii	1
3.	Identify the output of the following Python statements, where L1 is a List **L1=[6,4,2,9,7]** **print(L1[3:]= "100")** (a) [6,4,2,9,7,100] (b) [6,4,2,100] (c) [6,4,2,1,0,0] (d) [6,4,2, '1','0','0']	1
4.	Identify the Invalid relational operator in Python from the following. a) <= b) > c) == d) <>	1
5.	Which of the following statements create a dictionary? a) d = {} b) d = {"john":40, "peter":45} c) d = {40:"john", 45:"peter"} d) All of the mentioned above	1
6.	A text file is opened using the statement **f = open('story.txt').** The file has a total of 10 lines.Which of the following options will be true if statement 1 and statement 2 are executed in order. Statement 1: L1 = f.readline( ) Statement 2: L2 = f.readlines( ) a. L1 will be a list with one element and L2 will be list with 9 elements. b. L1 will be a string and L2 will be a list with 10 elements. c. L1 will be a string and L2 will be a list with 9 elements. d. L1 will be a list with 10 elements and L2 will be an empty list.	1

7.	Fill in the blank: _____ command is used to remove database from MySQL. (a) update (b)remove (c) alter (d)drop	1
8.	Which one of the following functions is used to find the largest value from the given data in MySQL? i. MAX( ) ii. MAXIMUM( ) iii. BIG( ) iv. LARGE( )	1
9.	What will be the output of this Python line? print("This is Delhi. # Delhi is the capital of India.") # This is a comment. a. This is Delhi. b. This is Delhi. # Delhi is the capital of India. # This is a comment. c. This is Delhi. # Delhi is the capital of India. d. This is Delhi. This is a comment.	1
10.	Which SQL statement do we use to find out the total number of records present in the table ORDERS? i. SELECT * FROM ORDERS; ii. SELECT COUNT (*) FROM ORDERS; iii. SELECT FIND (*) FROM ORDERS; iv. SELECT SUM () FROM ORDERS;	1
11.	Which of the following is not a function/method of a file object in python? a.read( ) b.writelines( ) c.dump( ) d.readlines( )	1
12.	If column "Fees" contains the data set (5000,8000,7500,5000,8000), what will be the output after the execution of the given query? SELECT SUM (DISTINCT Fees) FROM student; i. 20500 ii. 10000 iii. 20000 iv. 33500	1
13.	_____is the trail of data we leave behind when we visit any website (or use any online application or portal) to fill-in data or perform any transaction. i. Offline phishing ii. Offline footprint iii. Digital footprint iv. Digital phishing	1
14.	What will the following expression be evaluated to in Python? **print(15.0 / 4 + (8 + 3.0))** (a) 14.75 (b)14.0 (c) 15 (d) 15.5	1
15.	Which one of the following is not an aggregate function? i. ROUND() ii. SUM() iii. COUNT() iv. AVG()	1
16.	To establish a connection between Python and SQL database, connect() is used. Which of the following arguments may not necessarily be given while calling connect() ?	1

	(a) host (b) database (c) user (d) password	
Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as (a) Both A and R are true and R is the correct explanation for A (b) Both A and R are true and R is not the correct explanation for A (c) A is True but R is False (d) A is false but R is True		
17.	Assertion (A):- Pickle is library of Python. Reasoning (R):- This may raise the center of gravity of the boat.	1
18.	Assertion (A):- Dictionaries are mutable. Reason (R):- Individual elements can be changed in dictionary in place.	1
	Section B	

19.	**Find the error(s) in the following code snippet and write the corrected code.**
	Def check():
	N=25
	for i in range(0,N):
	if N%2=0:
	print(N*2)
	elif N%3==0
	print(N*3)
	Else:
	print(N)
	check()
	ANS)
	Find the error(s) in the following code snippet and write the corrected code.
		2

20.	Write one advantage of star topology over bus topology and one advantage of bus topology over star topology OR Suzuka, a freelance web site developer, has been assigned a task to design few web pages for a book shop. Help Suzuka in deciding out of static web page and dynamic web page, what kind of web pages should be designed by clearly differentiating between static and dynamic web pages on at least two points.	2
21.	(a) Given is a Python string declaration: myexam="@@CBSE Examination 2023@@" Write the output of: print(myexam[::-3]) (b) Write the output of the code given below: my_dict = {"name": "Aman", "age": 26} my_dict['age'] = 27 my_dict['address'] = "Mumbai" print(my_dict.items())	1 1
22.	Give difference between primary key and foreign key	2
23	a) Expand the following: FTP , HTML b) Which type of network (out of LAN, PAN and MAN) is formed, when you connect two mobiles using Bluetooth to transfer a video?	2
24	Predict the output of the Python code given below:	2

```
TXT = ["20","50","30","40"]
CNT = 3
TOTAL = 0
for C in [7,5,4,6]:
        T = TXT[CNT]
        TOTAL = float(T) + C
        print(TOTAL)
        CNT -= 1
```

OR

Predict the output of the Python code given below:

```
def runme(x=1, y=2):
  x = x+y
  y+=1
  print(x, '$', y)
  return x,y
a,b = runme()
print(a, '#', b)
runme(a,b)
print(a+b)
```

25 What is the difference between the order by and group by clause when used along with the select statement. Explain with an example. 2

OR

Categorize the following commands as DDL or DML:
INSERT, UPDATE, ALTER, DROP

SECTION C

26 a) What is natural join? 1+2

b) Write the output of the queries (a) to (d) based on the table, given below:

MOVIE

NO	TITLE	TYPE	RATING	SEATS_LEFT	PRICE
1	SANJU	BIOPIC	A	4	250
2	RAID	ACTION	B	2	175
3	RACE3	ACTION	C	7	245
4	HAAMI	COMEDY	A	3	130
5	BAHUBALI	DRAMA	A	3	300

```
i)Select *
from MOVIE
where PRICE between 200 and 275;

ii)select max(PRICE)
from MOVIE
where RATING=’A’;

iii)select * from MOVIE
where TITLE like ‘%I’ or RATING=’B’;
```

iv)select distinct(RATING)
from MOVIE;

27 Write a function in Python to print those words which contains letter 'S' or 's' anywhere in the word in text file "STORY.txt". 3

If the "STORY.txt" contents are as follows:
An Old Man is happy today, he doesn't complain
about anything, smiles, and even his face is
freshened up.

The output of the function should be:

is doesn't smiles his is freshened

OR

Write a function WordCount() in Python to read a text file "Mydiary.txt" and display no of words present in each line.

Example:

If the file content is as follows:

Updated information

As simplified by official websites.

The function should display the output as:

Line No 1 : Words=2

Line No 2 : Words=5

28 (a)Consider the following tables. Write SQL commands for the statements (i) to (iv). 2+1

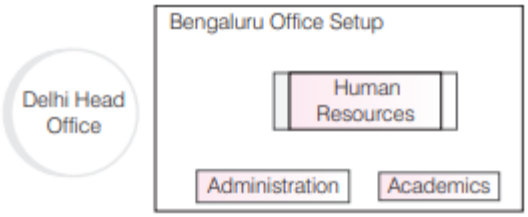
Table : SENDER

SenderID	SenderName	SenderAddress	SenderCity
ND01	R Jain	2, ABC Appts	New Delhi
MU02	H Sinha	12, Newtown	Mumbai
MU15	S Jha	27/A, Park Street	Mumbai
ND50	T Prasad	122-K, SDA	New Delhi

Table : RECIPIENT

RecID	SenderID	RecName	RecAddress	RecCity
KO05	ND01	R Bajpayee	5, Central Avenue	Kolkata
ND08	MU02	S Mahajan	116, A Vihar	New Delhi
MU19	ND01	H Singh	2A, Andheri East	Mumbai
MU32	MU15	P K Swamy	B5, C S Terminus	Mumbai
ND48	ND50	S Tripathi	13, B1 D, Mayur Vihar	New Delhi

(i)To display the names of all Senders from Mumbai.

<table>
<tr><td></td><td>(ii)To display the RecID, SenderName, SenderAddress, RecName, RecAddress for every Recipient.
(iii) To display Recipient details in ascending order of RecName.
(iv) To display number of Recipients from each City.
(b) Write the command to view the table structure.</td><td></td></tr>
<tr><td>29</td><td>Write a function LShift(Arr,n) in Python, which accepts a list Arr of numbers and n is a numeric value by which all elements of the list are shifted to left. Sample Input Data of the list
Arr= [10,20,30,40,12,11],
n=2
Output Arr = [30,40,12,11,10,20]</td><td>3</td></tr>
<tr><td>30</td><td>Write a function in Python PUSH(Arr), where Arr is a list of numbers. From this list push all numbers divisible by 5 into a stack implemented by using a list. Display the stack if it has at least one element, otherwise display appropriate error message.
OR
Write a function in Python POP(Arr), where Arr is a stack implemented by a list of numbers. The function returns the value deleted from the stack.</td><td>3</td></tr>
<tr><td colspan="3">SECTION D</td></tr>
<tr><td>31</td><td>G.R.K International Inc. is planning to connect its Bengaluru Office Setup with its Head Office in Delhi. The Bengaluru Office G.R.K. International Inc. is spread across an area of approx. 1 square kilometres consisting of 3 blocks. Human Resources, Academics and Administration. You as a network expert have to suggest answers to the four queries (i) to (v) raised by them.
 

Shortest distances between various blocks
<table>
<tr><td>Human Resources to Administration</td><td>100m</td></tr>
<tr><td>Human Resources to Academics</td><td>65m</td></tr>
<tr><td>Academics to Administration</td><td>110m</td></tr>
<tr><td>Delhi Head Office to Bengaluru Office Setup</td><td>2350 km</td></tr>
</table>
Number of computers installed at various blocks
<table>
<tr><th>Block</th><th>Number of Computers</th></tr>
<tr><td>Human Resources</td><td>155</td></tr>
<tr><td>Administration</td><td>20</td></tr>
<tr><td>Academics</td><td>100</td></tr>
<tr><td>Delhi Head Office</td><td>20</td></tr>
</table>
(i) Suggest the most suitable block in the Bengaluru Office Setup to host the server. Give a suitable reason with your suggestion.
(ii) Suggest the cable layout among the various blocks within the Bengaluru Office Setup for connecting the blocks.</td><td>5</td></tr>
</table>

	(iii) Suggest a suitable networking device to be installed in each of the blocks essentially required for connecting computers inside the blocks with fast and efficient connectivity. (iv) Suggest the most suitable media to provide secure, fast and reliable data connectivity between Delhi Head Office and the Bengaluru Office Setup. (v)Which type of network id formed between blocks of Bengaluru Office.	

32	a) What will be the output of the following code?
	value = 100
	def display (N):
	global value
	value = 150
	if N%7 == 0:
	value = value + N
	else:
	value = value - N
	print (value, end = '#')
	display (50)
	print (value)
	b)The code given below inserts the following record in the table Student:
	RollNo – integer
	Name – string
	Class – integer
	Marks – integer
	Note the following to establish connectivity between Python and MYSQL:
	• Username is root
	• Password is tiger
	• The table exists in a MYSQL database named school.
	• The details (RollNo, Name, Clas and Marks) are to be accepted from the user.
	Write the following missing statements to complete the code:
	Statement 1 – to form the cursor object
	Statement 2 – to execute the command that inserts the record in the table Student.
	Statement 3- to add the record permanently in the database
	import mysql.connector as mysql
	def sql_data():
	con1=mysql.connect(host="localhost",user="root",password="tiger", database="school")
	mycursor=_____ #Statement 1
	rno=int(input("Enter Roll Number :: "))
	name=input("Enter name :: ")
	class=int(input("Enter class :: "))
	marks=int(input("Enter Marks :: "))
	querry="insert into student values({},'{}',{},{})".format(rno,name,clas,marks)
	_____ #Statement 2
	_____ # Statement 3
	print("Data Added successfully")
	OR
	a) Find the output of the following code:
	Name = "cBsE@2051"
	R=" "
		2+3

	for x in range (len(Name)):
	if Name[x].isupper ( ):
	R = R + Name[x].lower()
	elif Name[x].islower():
	R = R + Name[x].upper()
	elif Name[x].isdigit():
	R = R + Name[x-1]
	else:
	R = R + "#"
	print(R)
	b) The code given below reads the following record from the table named student and displays only those records who have marks greater than 75:
	RollNo – integer
	Name – string
	Clas – integer
	Marks – integer
	Note the following to establish connectivity between Python and MYSQL:
	• Username is root
	• Password is tiger
	• The table exists in a MYSQL database named school. Write the following missing statements to complete the code:
	Statement 1 – to form the cursor object
	Statement 2 – to execute the query that extracts records of those students whose marks are greater than 75. Statement 3- to read the complete result of the query (records whose
	marks are greater than 75) into the object named data, from the table student in the database.
	import mysql.connector as mysql
	def sql_data():
	con1=mysql.connect(host="localhost",user="root", password="tiger", database="school")
	mycursor=_____ #Statement 1
	print("Students with marks greater than 75 are : ")
	_____ #Statement 2
	data=_____ #Statement 3
	for i in data:
	print(i)
	print()	

33	What is the advantage of using a csv file for permanent storage? Radha Shah is a programmer, who has recently been given a task to write a python code to perform the following CSV file operations with the help of two user defined functions/modules: a. CSVOpen() : to create a CSV file called BOOKS.CSV in append mode containing information of books – Title, Author and Price. b. CSVRead() : to display the records from the CSV file called BOOKS.CSV where the field title starts with 'R'. OR Write the full form of CSV.	5

	Amit is a programmer, who has recently been given a task to write a python code to perform the following CSV file operations with the help of two user defined functions/modules: (i) addCsvFile() – To accept and add data of an employee to a CSV file 'user.csv'. Each record consists of a list with field elements as UserName,PassWord to store UserName,PassWord respectively. (ii) readCsvFile()-to read data from CSV file.	
	SECTION E	
34.	Navdeep creates a table HOUSE with a set of records to maintain. After creation of the table, he has entered data of 6 houses in the table.	1+1+2

HID	Location	Quantity	Unit _Price	Dcode
H1	Raipur	10	500000	1
H2	Bilaspur	20	300000	2
H3	Bargarh	15	200000	3
H4	Ambikapur	25	250000	2
H5	Raipur	25	280000	2
H6	Bilaspur	20	240000	1

Based on the data given above answer the following questions:
(i) Identify the most appropriate column, which can be considered as Primary key.
(ii) If two columns are added and 2 rows are deleted from the table result, what will be the new degree and cardinality of the above table?
(iii) Write the statements to:
a. Insert the following record into the table HID – H7, Location - Chirimiri, Quantity - 10, Unit _Price -600000, Dcode- 3,
b. Increase the unit price of the house by 3% whose name ends with 'ur'.

OR

(iii) Write the statements to:
a. Delete the record of house location Ambikapur
b. Add a column REMARKS in the table with datatype as varchar with 50 characters

35 A binary file "Book.dat" has structure [BookNo, Book_Name, Author, Price]. i. Write a user defined function CreateFile() to input data for a record and add to Book.dat . ii. Write a function CountRec(Author) in Python which accepts the Author name as parameter and count and return number of books by the given Author are stored in the binary file "Book.dat"

```
import _____   #Statement 1
def createFile():
    fobj=open( _____)          # Statement 2
    BookNo=int(input("Book Number : "))
    Book_name=input("Name :")
    Author = input("Author: ")
    Price = int(input("Price : "))
    rec=[BookNo,Book_Name,Author,Price]
    pickle. _____              #Statement 3
```

```
        fobj.close()
def CountRec(Author):
        fobj=open("Book.dat","rb")
        num = 0
        try:
                while True:
                        rec=pickle. _____          #Statement 4
                        if Author==rec[2]:
                                num = num + 1
        except:
                fobj.close()
                return num
```

(i) Which module should be imported in the program? (Statement 1)

(ii) Write the correct statement required to open a temporary file named Book.dat. (Statement 2)

(iii) Which statement should be filled in Statement 3 to write the data in the binary file, Book.dat and in Statement 4 to write the read data in the file, Book.dat?

SET-1

KENDRIYA VIDYALAYA SANGATHAN, RAIPUR REGION

Class- XII Computer Science (083)

(2022-23)

Maximum Marks: 70 **Time Allowed: 3 hours**

General Instructions:

1. This question paper contains five sections, Section A to E.
2. All questions are compulsory.
3. Section A have 18 questions carrying 01 mark each.
4. Section B has 07 Very Short Answer type questions carrying 02 marks each.
5. Section C has 05 Short Answer type questions carrying 03 marks each.
6. Section D has 03 Long Answer type questions carrying 05 marks each.
7. Section E has 02 questions carrying 04 marks each. One internal choice is given in Q35 against part c only.
8. All programming questions are to be answered using Python Language only.

	Section A	
1.	Find the invalid identifier from the following a) KVS_Jpr b) false c) 3rdPlace d) _rank Ans) c) 3rdPlace ***(1 Mark for correct answer, No partial marking)***	1
2.	Consider a string **t = "hello"** . Identify the statements that will result in an error. **i. print (t(0)) ii. print(min(t)) iii. t[3]= 'k' iv. print (max(t))** a. only ii b. both ii and iv c. iii d. both ii and iii Ans) c. iii	1
3.	Identify the output of the following Python statements, where L1 is a List **L1=[6,4,2,9,7]** **print(L1[3:]= "100")** (a) [6,4,2,9,7,100] (b) [6,4,2,100] (c) [6,4,2,1,0,0] (d) [6,4,2, '1','0','0'] Ans) (d) [6,4,2, '1','0','0']	1
4.	Identify the Invalid relational operator in Python from the following. a) <= b) > c) == d) <> Ans)d	1
5.	**Which of the following statements create a dictionary?** **a) d = {}** **b) d = {"john":40, "peter":45}** **c) d = {40:"john", 45:"peter"}** **d) All of the mentioned above** **Ans) d) All of the mentioned above**	1

6.	A text file is opened using the statement **f = open('story.txt').** The file has a total of 10 lines.Which of the following options will be true if statement 1 and statement 2 are executed in order. Statement 1: L1 = f.readline( ) Statement 2: L2 = f.readlines( ) a. L1 will be a list with one element and L2 will be list with 9 elements. b. L1 will be a string and L2 will be a list with 10 elements. c. L1 will be a string and L2 will be a list with 9 elements. d. L1 will be a list with 10 elements and L2 will be an empty list. Ans)c) L1 will be a string and L2 will be a list with 9 elements.	1
7.	Fill in the blank: _____ command is used to remove database from MySQL. (a) update (b)remove (c) alter (d)drop Ans)d)drop	1
8.	Which one of the following functions is used to find the largest value from the given data in MySQL? i. MAX( ) ii. MAXIMUM( ) iii. BIG( ) iv. LARGE( ) Ans) i. MAX( )	1
9.	What will be the output of this Python line? print("This is Delhi. # Delhi is the capital of India.") # This is a comment. a. This is Delhi. b. This is Delhi. # Delhi is the capital of India. # This is a comment. c. This is Delhi. # Delhi is the capital of India. d. This is Delhi. This is a comment. Ans) c. This is Delhi. # Delhi is the capital of India.	1
10.	Which SQL statement do we use to find out the total number of records present in the table ORDERS? i. SELECT * FROM ORDERS; ii. SELECT COUNT (*) FROM ORDERS; iii. SELECT FIND (*) FROM ORDERS; iv. SELECT SUM () FROM ORDERS; Ans) ii. SELECT COUNT (*) FROM ORDERS;	1
11.	Which of the following is not a function/method of a file object in python? a.read( ) b.writelines( ) c.dump( ) d.readlines( ) Ans) b.writelines( )	1
12.	If column "Fees" contains the data set (5000,8000,7500,5000,8000), what will be the output after the execution of the given query? SELECT SUM (DISTINCT Fees) FROM student; i. 20500 ii. 10000 iii. 20000 iv. 33500	1

	Ans) i. 20500	
13.	_____is the trail of data we leave behind when we visit any website (or use any online application or portal) to fill-in data or perform any transaction. i. Offline phishing ii. Offline footprint iii. Digital footprint iv. Digital phishing Ans) iii. Digital footprint	1
14.	What will the following expression be evaluated to in Python? **print(15.0 / 4 + (8 + 3.0))** (a) 14.75 (b)14.0 (c) 15 (d) 15.5 Ans) (a) 14.75	1
15.	Which one of the following is not an aggregate function? i. ROUND() ii. SUM() iii. COUNT() iv. AVG() Ans) i. ROUND()	1
16.	To establish a connection between Python and SQL database, connect() is used. Which of the following arguments may not necessarily be given while calling connect() ? (a) host (b) database (c) user (d) password Ans) (b) – database	1
Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as (a) Both A and R are true and R is the correct explanation for A (b) Both A and R are true and R is not the correct explanation for A (c) A is True but R is False (d) A is false but R is True		
17.	Assertion (A):- Pickle is library of Python. Reasoning (R):- This may raise the center of gravity of the boat. Ans) (c) A is True but R is False	1
18.	Assertion (A):- Dictionaries are mutable. Reason (R):- Individual elements can be changed in dictionary in place. Ans) (a) Both A and R are true and R is the correct explanation for A	1
Section B		

19.	**Find the error(s) in the following code snippet and write the corrected code.**
	Def check():
	N=25
	for i in range(0,N):
	if N%2=0:
	print(N*2)
	elif N%3==0
	print(N*3)
	Else:
	print(N)
	check()
		2

ANS)

Find the error(s) in the following code snippet and write the corrected code.

```
def check():
N=25
for i in range(0,N):
    if N%2==0:
        print(N*2)
    elif N%3==0:
        print(N*3)
    else:
        print(N)
check()
```

20. Write one advantage of star topology over bus topology and one advantage of bus topology over star topology — 2

OR

Suzuka, a freelance web site developer, has been assigned a task to design few web pages for a book shop. Help Suzuka in deciding out of static web page and dynamic web page, what kind of web pages should be designed by clearly differentiating between static and dynamic web pages on at least two points.

Ans)

Advantage of star topology over bus topology

The star topology is the most reliable as there is a direct connection of every nodes in the network with the central node, so any problem in any node will affect the particular node only. While in bus topology, if problem exists in common medium, it will affect the entire node.

Advantage of bus topology over star topology

Extension of network is very easy in bus topology. We can connect new node along its length. While in star topology, it is difficult to expand, as the new node has to connect all the way to central node and there is not available port in central node.

OR

Differentiation between static and dynamic web pages:

Static Web page	**Dynamic Web page**
Content of this type of webpage cannot be changed at run time.	Content of this type of webpage can be changed at run time.
No interaction with server's database is possible in case of static web pages.	No interaction with server's database is possible in case of static web pages.

21. (a) Given is a Python string declaration: — 1

myexam="@@CBSE Examination 2023@@"

Write the output of: print(myexam[::-3])

(b) Write the output of the code given below: — 1

```
my_dict = {"name": "Aman", "age": 26}
my_dict['age'] = 27
my_dict['address'] = "Mumbai"
```

	print(my_dict.items()) Ans) a) @2 ina B@ b) dict_items([('name', 'Aman'), ('age', 27), ('address', 'Mumbai')])	
22.	Give difference between primary key and foreign key Ans) Foreign keys : A table can have multiple foreign keys depending on the number of tables to which the mother table has links. Foreign Key can allow NULL value in column. Primary Key : There can be only one primary key in a table. Primary Key will not allow NULL values.	2
23	a) Expand the following: FTP , HTML b) Which type of network (out of LAN, PAN and MAN) is formed, when you connect two mobiles using Bluetooth to transfer a video? Ans) a) FTP : File Transfer Protocol HTML : Hyper Text Transfer Protocol b)PAN	2

24	Predict the output of the Python code given below:
	TXT = ["20","50","30","40"]
	CNT = 3
	TOTAL = 0
	for C in [7,5,4,6]:
	T = TXT[CNT]
	TOTAL = float(T) + C
	print(TOTAL)
	CNT -= 1
	OR
	Predict the output of the Python code given below:
	def runme(x=1, y=2):
	x = x+y
	y+=1
	print(x, '$', y)
	return x,y
	a,b = runme()
	print(a, '#', b)
	runme(a,b)
	print(a+b)
	Ans)
	47.0
	35.0
	54.0
	26.0
	OR
	3 $ 3
	3 # 3
		2

	6 $ 4 6	
25	What is the difference between the order by and group by clause when used along with the select statement. Explain with an example. OR Categorize the following commands as DDL or DML: INSERT, UPDATE, ALTER, DROP Ans) The order by clause is used to show the contents of a table/relation in a sorted manner with respect to the column mentioned after the order by clause. The contents of the column can be arranged in ascending or descending order. The group by clause is used to group rows in a given column and then apply an aggregate function eg max(), min() etc on the entire group. (any other relevant answer) OR DDL - ALTER, DROP DML - INSERT, UPDATE	2
	SECTION C	
26	a) What is natural join? b) Write the output of the queries (a) to (d) based on the table, given below: **MOVIE** **NO** | **TITLE** | **TYPE** | **RATING** | **SEATS_LEFT** | **PRICE** 1 | SANJU | BIOPIC | A | 4 | 250 2 | RAID | ACTION | B | 2 | 175 3 | RACE3 | ACTION | C | 7 | 245 4 | HAAMI | COMEDY | A | 3 | 130 5 | BAHUBALI | DRAMA | A | 3 | 300 i)Select * from MOVIE where PRICE between 200 and 275; ii)select max(PRICE) from MOVIE where RATING=’A’; iii)select * from MOVIE where TITLE like ‘%I’ or RATING=’B’; iv)select distinct(RATING) from MOVIE; Ans) a) NATURAL JOIN is a JOIN operation that creates an implicit join clause for **you based on the common columns in the two tables being joined**. Common columns are columns that have the same name in both tables.	1+2

b)

(i)

NO	TITLE	TYPE	RATING	SEATS_LEFT	PRICE
1	SANJU	BIOPIC	A	4	250
3	RACE3	ACTION	C	7	245

ii) 300

(iii)

NO	TITLE	TYPE	RATING	SEATS_LEFT	PRICE
2	RAID	ACTION	B	2	175
4	HAAMI	COMEDY	A	3	130
5	BAHUBALI	DRAMA	A	3	300

iv)

RATING
A
B
C

27 Write a function in Python to print those words which contains letter 'S' or 's' anywhere in the word in text file "STORY.txt". 3

If the "STORY.txt" contents are as follows:
An Old Man is happy today, he doesn't complain
about anything, smiles, and even his face is
freshened up.

The output of the function should be:

is doesn't smiles his is freshened

OR

Write a function WordCount() in Python to read a text file "Mydiary.txt" and display no of words present in each line.

Example:

If the file content is as follows:

Updated information

As simplified by official websites.

The function should display the output as:

Line No 1 : Words=2

Line No 2 : Words=5

Ans)

```
def DisplayWords():
  f=open("D://STORY.txt","r")
  s=f.read()
  for w in s.split():
    if "s" in w or "S" in w:
      print(w)
  f.close()
```

OR

```
def WordCount():
    f=open("D://mydiary.txt","r")
    ln=0
    for line in f:
        ln=ln+1
        c=0
        for word in line.split():
            c=c+1
        print("Line No",ln,":",c)
    f.close()
```

(½ marks for correct function header)

(½ mark for correct opening file)

(½ mark for correct reading from file)

(½ mark for correct condition or counting loop)

(½ mark for printing output correctly)

(½ mark for closing file correctly)

28 (a)Consider the following tables. Write SQL commands for the statements (i) to (iv). 2+1

Table : SENDER

SenderID	SenderName	SenderAddress	SenderCity
ND01	R Jain	2, ABC Appts	New Delhi
MU02	H Sinha	12, Newtown	Mumbai
MU15	S Jha	27/A, Park Street	Mumbai
ND50	T Prasad	122-K, SDA	New Delhi

Table : RECIPIENT

RecID	SenderID	RecName	RecAddress	RecCity
KO05	ND01	R Bajpayee	5, Central Avenue	Kolkata
ND08	MU02	S Mahajan	116, A Vihar	New Delhi
MU19	ND01	H Singh	2A, Andheri East	Mumbai
MU32	MU15	P K Swamy	B5, C S Terminus	Mumbai
ND48	ND50	S Tripathi	13, B1 D, Mayur Vihar	New Delhi

(i)To display the names of all Senders from Mumbai.
(ii)To display the RecID, SenderName, SenderAddress, RecName, RecAddress for every Recipient.
(iii) To display Recipient details in ascending order of RecName.
(iv) To display number of Recipients from each City.
(b) Write the command to view the table structure.
Ans)
a)
(i)SELECT SenderName FROM SENDER WHERE SenderCity = ‘Mumbai’;

	(ii)SELECT RecID, SenderName, SenderAddress, RecName, RecAddress FROM RECIPIENT, SENDER WHERE RECIPIENT.SenderID = SENDER.SenderID; (iii)SELECT * FROM RECIPIENT ORDER BY RecName; (iv)SELECT COUNT(*) AS "No. of Recipients", RecCity FROM RECIPIENT GROUP BY RecCity; b)Desc <table name>;	

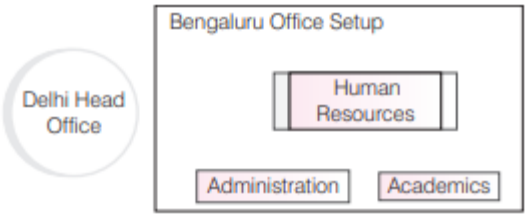
29	Write a function LShift(Arr,n) in Python, which accepts a list Arr of numbers and n is a numeric value by which all elements of the list are shifted to left. Sample Input Data of the list
	Arr= [10,20,30,40,12,11],
	n=2
	Output Arr = [30,40,12,11,10,20]
	Ans)
	def LShift(Arr,n):
	L=len(Arr)
	for x in range(0,n):
	y=Arr[0]
	for i in range(0,L-1):
	Arr[i]=Arr[i+1]
	Arr[L-1]=y
	print(Arr)
	Note : Using of any correct code giving the same result is also accepted.
		3

30	Write a function in Python PUSH(Arr), where Arr is a list of numbers. From this list push all numbers divisible by 5 into a stack implemented by using a list. Display the stack if it has at least one element, otherwise display appropriate error message.
	Answer –
	def PUSH(Arr,value):
	s=[]
	for x in range(0,len(Arr)):
	if Arr[x]%5==0:
	s.append(Arr[x])
	if len(s)==0:
	print("Empty Stack")
	else:
	print(s)
	
	OR
	
	Write a function in Python POP(Arr), where Arr is a stack implemented by a list of numbers. The function returns the value deleted from the stack.
	Answer –
	def popStack(st) : # If stack is empty
	if len(st)==0:
	print("Underflow")
	else:
	L = len(st)
	val=st[L-1]
	print(val)
		3

st.pop(L-1)
Note: Full marks can be awarded for any other correct logic.

SECTION D

31 G.R.K International Inc. is planning to connect its Bengaluru Office Setup with its Head Office in Delhi. The Bengaluru Office G.R.K. International Inc. is spread across an area of approx. 1 square kilometres consisting of 3 blocks. Human Resources, Academics and Administration. You as a network expert have to suggest answers to the four queries (i) to (v) raised by them. 5



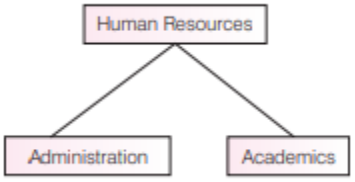
Shortest distances between various blocks

Human Resources to Administration	100m
Human Resources to Academics	65m
Academics to Administration	110m
Delhi Head Office to Bengaluru Office Setup	2350 km

Number of computers installed at various blocks

Block	**Number of Computers**
Human Resources	155
Administration	20
Academics	100
Delhi Head Office	20

(i) Suggest the most suitable block in the Bengaluru Office Setup to host the server. Give a suitable reason with your suggestion.
(ii) Suggest the cable layout among the various blocks within the Bengaluru Office Setup for connecting the blocks.
(iii) Suggest a suitable networking device to be installed in each of the blocks essentially required for connecting computers inside the blocks with fast and efficient connectivity.
(iv) Suggest the most suitable media to provide secure, fast and reliable data connectivity between Delhi Head Office and the Bengaluru Office Setup.
(v)Which type of network id formed between blocks of Bengaluru Office.
Ans)
(i)Human Resources, because it has maximum number of computers.
(ii)



(iii) Hub/Switch.
(iv) Satellite.

	(v) LAN	

32	a) What will be the output of the following code?
	value = 100
	def display (N):
	global value
	value = 150
	if N%7 == 0:
	value = value + N
	else:
	value = value - N
	print (value, end = '#')
	display (50)
	print (value)
	b)The code given below inserts the following record in the table Student:
	RollNo – integer
	Name – string
	Class – integer
	Marks – integer
	Note the following to establish connectivity between Python and MYSQL:
	• Username is root
	• Password is tiger
	• The table exists in a MYSQL database named school.
	• The details (RollNo, Name, Clas and Marks) are to be accepted from the user.
	Write the following missing statements to complete the code:
	Statement 1 – to form the cursor object
	Statement 2 – to execute the command that inserts the record in the table Student.
	Statement 3- to add the record permanently in the database
	import mysql.connector as mysql
	def sql_data():
	con1=mysql.connect(host="localhost",user="root",password="tiger", database="school")
	mycursor=_____ #Statement 1
	rno=int(input("Enter Roll Number :: "))
	name=input("Enter name :: ")
	class=int(input("Enter class :: "))
	marks=int(input("Enter Marks :: "))
	querry="insert into student values({},'{}',{},{})".format(rno,name,clas,marks)
	_____ #Statement 2
	_____ # Statement 3
	print("Data Added successfully")
	OR
	a) Find the output of the following code:
	Name = "cBsE@2051"
	R=" "
	for x in range (len(Name)):
	if Name[x].isupper ( ):
	R = R + Name[x].lower()
	elif Name[x].islower():
	R = R + Name[x].upper()
		2+3

	elif Name[x].isdigit():
	R = R + Name[x-1]
	else:
	R = R + "#"
	print(R)
	b) The code given below reads the following record from the table named student and displays only those records who have marks greater than 75:
	RollNo – integer
	Name – string
	Clas – integer
	Marks – integer
	Note the following to establish connectivity between Python and MYSQL:
	• Username is root
	• Password is tiger
	• The table exists in a MYSQL database named school. Write the following missing statements to complete the code:
	Statement 1 – to form the cursor object
	Statement 2 – to execute the query that extracts records of those students whose marks are greater than 75. Statement 3- to read the complete result of the query (records whose
	marks are greater than 75) into the object named data, from the table student in the database.
	import mysql.connector as mysql
	def sql_data():
	con1=mysql.connect(host="localhost",user="root", password="tiger", database="school")
	mycursor=_____ #Statement 1
	print("Students with marks greater than 75 are : ")
	_____ #Statement 2
	data=_____ #Statement 3
	for i in data:
	print(i)
	print()
	Ans)
	a) 100#100
	b) Statement 1: con1.cursor()
	Statement 2: mycursor.execute(querry)
	Statement 3: con1.commit()
	OR
	a) CbSe#@205
	b) Statement 1: con1.cursor()
	Statement 2: mycursor.execute("select * from student where Marks>75")
	Statement 3: mycursor.fetchall()	

33	What is the advantage of using a csv file for permanent storage? Radha Shah is a programmer, who has recently been given a task to write a python code to perform the following CSV file operations with the help of two user defined functions/modules: a. CSVOpen() : to create a CSV file called BOOKS.CSV in append mode containing information of books – Title, Author and Price.	5

b. CSVRead() : to display the records from the CSV file called BOOKS.CSV where the field title starts with 'R'.

OR

Write the full form of CSV.

Amit is a programmer, who has recently been given a task to write a python code to perform the following CSV file operations with the help of two user defined functions/modules:

(i) addCsvFile() – To accept and add data of an employee to a CSV file 'user.csv'. Each record consists of a list with field elements as UserName,PassWord to store UserName,PassWord respectively.

(ii) readCsvFile()-to read data from CSV file.

Ans)

Advantage of a csv file:

- It is human readable – can be opened in Excel and Notepad applications
- It is just like text file

```
import csv
def CSVOpen():
    with open('books.csv','a',newline='') as csvf: #Statement-1
    cw=csv.writer(csvf)
    cw.writerow(['Title','Author','Price'])
    writerow(['Rapunzel','Jack',300])
    cw.writerow(['Barbie','Doll',900])
    cw.writerow(['Johnny','Jane',280])
def CSVRead():
    try:
        with open('books.csv','r') as csvf:
        cr=csv.reader(csvf)
        for r in cr:
            if r[0][0]=='R'
            print(r)
    except:
print('File Not Found')
CSVOpen()
CSVRead()
```

OR

Comma Seperated value

```
import csv
def addCsvFile(UserName,PassWord):
# to write / add data into the CSV file
        f=open(' user.csv','a')
        newFileWriter = csv.writer(f)
        newFileWriter.writerow([UserName,PassWord])
        f.close()
#csv file reading code
def readCsvFile(): # to read data from CSV file
        with open(' user.csv','r') as newFile:
        newFileReader = csv.reader(newFile)
         for row in newFileReader:
```

print (row[0],row[1])
newFile.close()

SECTION E

34. Navdeep creates a table HOUSE with a set of records to maintain. After creation of the table, he has entered data of 6 houses in the table. 1+1+2

HID	Location	Quantity	Unit _Price	Dcode
H1	Raipur	10	500000	1
H2	Bilaspur	20	300000	2
H3	Bargarh	15	200000	3
H4	Ambikapur	25	250000	2
H5	Raipur	25	280000	2
H6	Bilaspur	20	240000	1

Based on the data given above answer the following questions:
(i) Identify the most appropriate column, which can be considered as Primary key.
(ii) If two columns are added and 2 rows are deleted from the table result, what will be the new degree and cardinality of the above table?
(iii) Write the statements to:
a. Insert the following record into the table HID – H7, Location - Chirimiri, Quantity - 10, Unit _Price -600000, Dcode- 3,
b. Increase the unit price of the house by 3% whose name ends with 'ur'.

OR

(iii) Write the statements to:
a. Delete the record of house location Ambikapur
b. Add a column REMARKS in the table with datatype as varchar with 50 characters

Ans)
i)HID
ii)Degree-7, Cardinality-4
iii)
a)insert into house values(' H7', ' Chirimiri', 10, 600000, 3);
b)update house set unit_price= unit_price+ unit_price*0.03 where Location like '%ur';

OR

iii)
a)Delete from house where location='Ambikapur';
b)ALTER table house add remarks varchar(50);

35 A binary file "Book.dat" has structure [BookNo, Book_Name, Author, Price]. i. Write a user defined function CreateFile() to input data for a record and add to Book.dat . ii. Write a function CountRec(Author) in Python which accepts the Author name as parameter and count and return number of books by the given Author are stored in the binary file "Book.dat"

```
import _____  #Statement 1
def createFile():
```

```
        fobj=open( _____)              # Statement 2
        BookNo=int(input("Book Number : "))
        Book_name=input("Name :")
        Author = input("Author: ")
        Price = int(input("Price : "))
        rec=[BookNo,Book_Name,Author,Price]
        pickle. _____                  #Statement 3
        fobj.close()
def CountRec(Author):
        fobj=open("Book.dat","rb")
        num = 0
        try:
                while True:
                        rec=pickle. _____          #Statement 4
                        if Author==rec[2]:
                                num = num + 1
        except:
                fobj.close()
                return num
```

(i) Which module should be imported in the program? (Statement 1)
(ii) Write the correct statement required to open a temporary file named Book.dat. (Statement 2)
(iii) Which statement should be filled in Statement 3 to write the data in the binary file, Book.dat and in Statement 4 to write the read data in the file, Book.dat?
Ans)
i)pickle
ii) ("Book.dat","ab")
iii) dump(rec,fobj)
load(fobj)

SET-2

KENDRIYA VIDYALAYA SANGATHAN, RAIPUR REGION

Class- XII Computer Science (083)

(2022-23)

Maximum Marks: 70 **Time Allowed: 3 hours**

General Instructions:

1. This question paper contains five sections, Section A to E.
2. All questions are compulsory.
3. Section A have 18 questions carrying 01 mark each.
4. Section B has 07 Very Short Answer type questions carrying 02 marks each.
5. Section C has 05 Short Answer type questions carrying 03 marks each.
6. Section D has 03 Long Answer type questions carrying 05 marks each.
7. Section E has 02 questions carrying 04 marks each. One internal choice is given in Q35 against part c only.
8. All programming questions are to be answered using Python Language only.

	Section A	
1.	Find the valid identifier from the following (a) Tot$balance (b) TRUE (c) 4thdata (d) break	1
2.	Given a string S = “ComPUterSciEnce”, write the output of print(S[3:10:2])	1
3.	Identify the valid declaration of T: T = {“Roll”:123, “Name”: “Hiya”, “Class”:12, “Subject” : ”Computer Science”} a. dictionary b. string c. tuple d. list	1
4.	Identify the valid relational operator in Python from the following. (a) ? (b) => (c) != (d) in	1
5.	What is the output of the following code? S1=”Computer2023” S2=”2023” print(S1.isdigit(), S2.isdigit()) a)False True b) False False c) True False d) True True	1
6.	The ‘r+’ mode will: (A) Enable both reading and writing. (B) Raise an error if the file doesn’t exist. (C) Over write the already existing file. (D) Both (A) & (B)	1
7.	Which of the following is a DML command ? (a) DROP (b) INSERT (c) ALTER (d) CREATE	1
8.	Which among the following are valid table constraints? a) Candidate Key b) NULL c) Distinct d) Primary Key	1

9.	Suppose a tuple T is declared as T=(10,20,30) and a list L=["mon", "tue", "wed", "thu", "fri", "sat", "sun"], which of the following is incorrect ? a) min(L) b) L[2] = 40 c) T[3] = “thurs” d) print(min(T))	1
10.	The statement in SQL which allows to change the definition of a table is (a) Alter. (b) Update. (c) Create. (d) select.	1
11.	Which of the following options can be used to read the first line of a text file “Myfile.txt”? (A) myfile = open(‘Myfile.txt’); myfile.read() (B) myfile = open(‘Myfile.txt’,’r’); myfile.read(n) (C) myfile = open(‘Myfile.txt’); myfile.readline() (D) myfile = open(‘Myfile.txt’); myfile.readlines()	1
12.	Consider the following query Select * from employee order by salary _____, name _____ ; To display the salary from greater to smaller and name in alphabetical order which of the following option should be used? a)ascending, descending b)asc,desc c)desc,asc d)Descending,Ascending	1
13.	A distributed network configuration in which all data/information pass through a central computer is _____ network: a)ring b)bus c)star d)mesh	1
14.	What will the following expression be evaluated to in Python? Print((4.00/(2.0+2.0))) a)Error b)1.0 c)1.00 d)1	1
15.	Which operator checks a value’s presence in alist of values? a)between b)like c)in d)not	1
16.	In order to open a connection with MySQL , database from within Python using mysql.connector package,_____ function is used. a)open() b)database() c)connect() d)connectdb()	1
Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as (a) Both A and R are true and R is the correct explanation for A		

(b) Both A and R are true and R is not the correct explanation for A (c) A is True but R is False (d) A is false but R is True		
17.	Assertion (A):- Strings are immutable. Reason (R):- Individual elements can not be changed in string in place.	1
18.	Assertion (A):- open() is a method of python. Reason (R):- open() method is used to open a file in Python and itreturns a file object called file handle. The file handle is used to transfer data to and from the file by calling the function defined in Python's io module.	1
	Section B	

19.	Rewrite the following code in Python after removing all syntax error(s). Underline each correction done in the code.
	STRING=""WELCOME
	NOTE = " "
	for S in range(0,8):
	if STRING[S]= 'E':
	print(STRING(S))
	Else:
	print "NO"
		2

20.	Differentiate between Spam and Trojan horse in context of networking and data communication threats. **OR** Differentiate between URL and Domain name. Explain with help of a suitable example.	2
21.	(a) If the following code is executed, what will be the output of the following code ? Lt=[1,"Computer",2,"Science",10,"PRE",30,"BOARD"] print(Lt[3:]) (b) Identify the output of the following Python statements. x = [[10.0, 11.0, 12.0],[13.0, 14.0, 15.0]] y = x[1][2] print(y) a. 12.0 b. 13.0 c. 14.0 d. 15.0	1 1
22.	What do you understand by Candidate Keys in a table? Give a suitable example of Candidate Keys from a table containing some meaningful data	2
23	Expand the following terms: a. FTP b. HTML c. PAN d. GPRS	2

24	What will be the output of following Python Code:
	def change(num):
	for x in range(0,len(num),2):
	num[x], num[x+1]=num[x+1], num[x]
	
	data=[10,20,30,40,50,60]
	change(data)
	print(data)
	OR
		2

Find the output of the following code:

```
def change (p, q=50):
        p = p+q
        q = p-q
        print(p, '#', q)
        return (p)
r = 300
s = 150
r = change (r,s)
print(r,"#",s)
s = change(s)
```

25 Anjali writes the following commands with respect to a table employee having fields, empno, name, department, commission. 2

Command1 : Select count(*) from employee;

Command2: Select count(commission) from employee; She gets the output as 4 for the first command but gets an output 3 for the second command. Explain the output with justification.

OR

Which of the following is not a DML command? Also write the full form of DML command.

DELETE FROM, DROP TABLE, CREATE TABLE, INSERT INTO

SECTION C

26 a) Write the outputs of the SQL queries (i) based on relations EMP and DESIG given below: 1+2

Table: EMP

E_ID	Name	Gender	Age	DOJ	Designation
1	Om Prakash	M	35	10/11/2009	Manager
2	Jai Kishan	M	32	12/05/2013	Accountant
3	Shreya Sharma	F	30	05/02/2015	Clerk
4	Rakesh Minhas	M	40	15/05/2007	Manager
5	Himani Singh	F	33	19/09/2010	Clerk

Table: DESIG

Salary	E_ID	DEPT_ID
45000	1	D101
35000	2	D102
45000	4	D101

i) SELECT EMP.Name, EMP.Designation,DESIG.Salary FROM EMP, DESIG WHERE
EMP.E_ID = DESIG.E_ID AND EMP.Age>35;

b)Write the outputs of the SQL queries (i) to (iv) based on table EMP given below:

Table: EMP

E_ID	Name	Gender	Age	DOJ	Designation
1	Om Prakash	M	35	10/11/2009	Manager
2	Jai Kishan	M	32	12/05/2013	Accountant

3	Shreya Sharma	F	30	05/02/2015	Clerk
4	Rakesh Minhas	M	40	15/05/2007	Manager
5	Himani Singh	F	33	19/09/2010	Clerk

i) SELECT Designation, count(*) FROM EMP GROUP BY Designation;
ii) SELECT AVG(Age) FROM EMP;
iii) SELECT Name,Designation,Gender FROM EMP where Gender='F' order by name;
iv) SELECT distinct(Designation) from EMP;

27 Write a method cnt_M() in Python to read lines from a text file 'MYNOTES.TXT', and display those lines, which are starting with the alphabet 'M'. 3

If the "MYNOTES.TXT" contents are as follows:
My first book was
Me and My Family.
It gave me chance to be
Known to the world.
The output of the function should be:
Count of lines starting with M is: 2

OR

Write a method/function BIGWORDS() in Python to read contents from a text file CODE.TXT, to count and display the occurrence of those words, which are having 7 or more alphabets.
For example :
If the content of the file is
ME AND MY FRIENDS
ENSURE SAFETY AND SECURITY OF EVERYONE
The output of the function should be: 3

28 Consider the following tables WORKERS and DESIG. Give outputs for SQL queries (i) to (iv) : 2+1

WORKERS

W_ID	FIRSTNAME	LASTNAME	GENDER	ADDRESS	CITY
102	Sam	Tones	M	33 Elm St	Paris
105	Sarah	Ackerman	F	U.S. 110	New York
144	Manila	Sengupta	F	24 Friends Street	New Delhi
210	George	Smith	M	83 First Street	Howard
255	Mary	Jones	F	842,Vine Ave.	Losantiville
300	Robert	Samuel	M	9 Fifth Cross	Washington
335	Henry	Williams	M	12 Moore Street	Boston
403	Ronny	Lee	M	121 Harrison St.	New York

451	Pat	Thompson	M	11 Red Road	Paris	

DESIG

W_ID	SALARY	BENEFITS	DESIGNATION
102	75000	15000	Manager
105	85000	25000	Director
144	70000	15000	Manager
210	75000	12500	Manager
255	50000	12000	Clerk
300	45000	10000	Clerk
335	40000	10000	Clerk
400	32000	7500	Salesman
451	28000	7500	Salesman

(i) To display the content of WORKERS table in ascending order of LASTNAME.
(ii) To display First Name, Worker ID and Address of male Workers only.
(iii) To display the Minimum salary among Managers and Clerks from the table DESIG.
(iv) To display First Name and Salary from Workers and Designaion Table for each worker.
(b) Write the command to view all the database.

29 Write definition of a method ODDSum(NUMBERS) to add those values in the list of NUMBERS, which are odd. 1
Sample Input Data of the List
NUMBERS=[20,40,10,5,12,11]
OUTPUT is 16

30 Write a function in Python PUSH(Num), where Num is a list of integer numbers. From this list push all positive even numbers into a stack implemented by using a list. Display the stack if it has at least one element, otherwise display appropriate error message. 3

OR

Write a function in Python POP(cities), where cities is a stack implemented by a list of city names for eg. cities=['Delhi', 'Jaipur', 'Mumbai', 'Nagpur']. The function returns the value deleted from the stack.

SECTION D

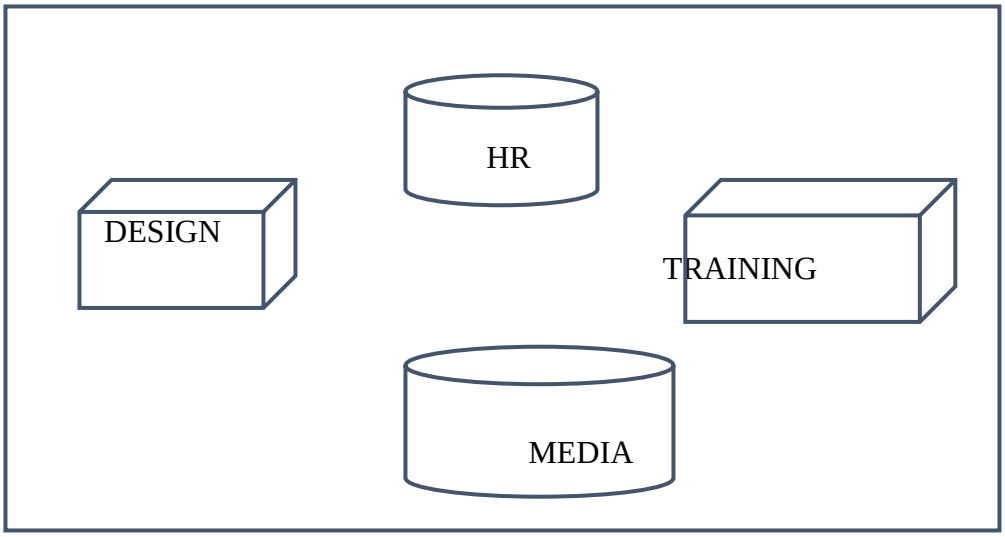
31 Biyani Design and Training Institute is setting up its center in Jaipur with four specialized units for Design, Media, HR and Training in separate buildings. The physical distances between these units and the number of computers to be installed in these units are given as follows. 5
You as a network expert, have to answer the queries as raised by the administrator as given in (i) to (v).
Shortest distances between various locations in meters :

Design Unit to Media Unit	60
Design Unit to HR Unit	40
Design Unit to Training Unit	60

Media Unit to Training Unit	100
Media Unit to HR Unit	50
Training Unit to HR Unit	60

Number of computers installed at various locations are as follows:

Design Unit	40
Media Unit	50
HR Unit	110
Training Unit	40



a)Suggest the most suitable place (i.e.,Unit/Building) to install the server of this Institute.
b) Suggest an ideal layout for connecting these Unit/Building for a wired connectivity.
c) Suggest the devices to be installed in each of these buildings for connecting computers installed within each of the units out of the following :
Modem, Switch, Gateway, Router
d) Suggest an efficient as well as economic wired medium to be used within each unit for connecting computer systems out of the following network cable :
Co-axial Cable, Ethernet Cable, Single Pair Telephone Cable.
e) The institute is planning to connect its admission office in Bangalore, which is 1960km from institute. Which type of network out of LAN, MAN or WAN will be formed ? Justify your answer.

32	a) Write the output given by following Python code.
	x=1
	def fun1():
	  x=3
	  x=x+1
	  print(x)
	
	def fun2():
	  global x
		2+3

```
    x=x+2
    print(x)

fun1()
fun2()
```

b)

b)The code given below inserts the following record in the table Employee:
Eid – integer
Name – string
DeptID – integer
Salary – integer

Note the following to establish connectivity between Python and MYSQL:

- Username is root
- Password is tiger
- The table exists in a MYSQL database named Company.
- The details (Eid, Name, DeptID and Salary) are to be accepted from the user.

Write the following missing statements to complete the code:
Statement 1 – to form the cursor object
Statement 2 – to execute the command that inserts the record in the table Employee.
Statement 3- to add the record permanently in the database

```
import mysql.connector as mysql
def sql_data():
        con1=mysql.connect(host="localhost",user="root",password="tiger",
database="company")
        mycursor=_____ #Statement 1
        rno=int(input("Enter Employee ID :: "))
        name=input("Enter name :: ")
        class=int(input("Enter Department ID :: "))
        marks=int(input("Enter Salary :: "))
        querry="insert into employee
values({},'{}',{},{})".format(eid,name,deptid,salary)
_____ #Statement 2
        _____ # Statement 3
        print("Data Added successfully")
```

OR

a) Find and write the output of the following python code:

```
def fun(s):
        k=len(s)
        m=" "
        for i in range(0,k):
                if(s[i].isupper()):
                        m=m+s[i].lower()
                elif s[i].isalpha():
                        m=m+s[i].upper()
                else: m=m+'bb'
        print(m)
fun('school2@com')
```

b) The code given below reads the following record from the table named student and displays only those records where students name starts with 'A':
RollNo – integer
Name – string
Clas – integer
Marks – integer
Note the following to establish connectivity between Python and MYSQL:

- Username is root
- Password is tiger
- The table exists in a MYSQL database named school. Write the following missing statements to complete the code:

Statement 1 – to form the cursor object
Statement 2 – to execute the query that extracts records of those students where students name starts with 'A'.
Statement 3- to read the complete result of the query (records where students name starts with 'A') into the object named data, from the table student in the database.

```
 import mysql.connector as mysql
def sql_data():
        con1=mysql.connect(host="localhost",user="root", password="tiger",
database="school")
        mycursor=_____ #Statement 1
        print("Students where students name starts with 'A': ")
        _____ #Statement 2
        data=_____ #Statement 3
        for i in data:
                print(i)
        print()
```

33 Give any one point of difference between a binary file and a csv file. What is the advantage of using a csv file for permanent storage? Write a Program in Python that defines and calls the following user defined functions: (i) ADD() – To accept and add data of an employee to a CSV file 'record.csv'. Each record consists of a list with field elements as empid, name and mobile to store employee id, employee name and employee salary respectively.
(ii) COUNTR() – To count the number of records present in the CSV file named 'record.csv'. — 5

OR

Write a Program in Python that defines and calls the following user defined functions:
(i) add() – To accept and add data of an employee to a CSV file 'furdata.csv'. Each record consists of a list with field elements as fid, fname and fprice to store furniture id, furniture name and furniture price respectively.
(ii) search()- To display the records of the furniture whose price is more than 10000.

SECTION E

34. Consider the following table named ''SOFTDRINK''. — 1+1+2

Table : SOFTDRINK

DRINKCODE	DNAME	PRICE	CALORIES
101	Lime and Lemon	20.00	120
102	Apple Drink	18.00	120
103	Nature Nectar	15.00	115
104	Green Mango	15.00	140
105	Aam Panna	20.00	135

106	Mango Juice Bahaar	12.00	150	

Based on the data given above answer the following questions:
(i)Identify the most appropriate column, which can be considered as Primary key.
(ii) If two columns are added and 2 rows are added from the table result, what will be the new degree and cardinality of the above table?
(iii) Write the statements to:
a. Insert the following record into the table DRINKCODE –107, DNAME- Khatta Aam, PRICE-15.00, CALORIES-100.
b. Increase the PRICE of the SOFTDRINK''by 3% whose name begins with 'A'.

OR

(iii)
Write the statements to:
a. Delete the record of SOFTDRINK containing calories 120.
b. Add a column FAT in the table with datatype as decimal(5,2).

35 Amritya Seth is a programmer, who has recently been given a task to write a python code to perform the following binary file operations with the help of two user defined functions/modules: 4

a. AddStudents() to create a binary file called STUDENT.DAT containing student information – roll number, name and marks (out of 100) of each student.
b. GetStudents() to display the name and percentage of those students who have a percentage greater than 75. In case there is no student having percentage > 75 the function displays an appropriate message. The function should also display the average percent.
He has succeeded in writing partial code and has missed out certain statements, so he has left certain queries in comment lines. You as an expert of Python have to provide the missing statements and other related queries based on the following code for Amritya. Answer the below mentioned questions.

```
import _____          #Statement 1
def AddStudents():
_____ #2 statement to open the binary file to write data
        while True:
            Rno = int(input("Rno :"))
            Name = input("Name : ")
            Percent = float(input("Percent :"))
            L = [Rno, Name, Percent]
            _____ #3 statement to write the list L into the file
            Choice = input("enter more (y/n): ")
            if Choice in "nN":
                break
        F.close()
def GetStudents():
        Total=0
        Countrec=0
        Countabove75=0
        with open("STUDENT.DAT","rb") as F:
        while True:
            try: _____ #4 statement to read from the file
            Countrec+=1
```

```
                    Total+=R[2]
                    if R[2] > 75:
                            print(R[1], " has percent = ",R[2])
                            Countabove75+=1
                    except:
                            break
            if Countabove75==0:
                    print("There is no student who has percentage more than 75")
            average=Total/Countrec
            print("average percent of class = ",average)
AddStudents()
GetStudents()
```

i)Which module should be imported in the program? (Statement 1)

ii)Write code to open the binary file to write data. (Statement 2)

iii) Write statement to write the list L into the file. (Statement 3)

iv) Write statement to read from the file. (Statement 4)

SET-2

COMPUTER SCIENCE(083)

2022-23

MARKING SCHEME

Maximum Marks : 70 Time Allowed: 3 hours

Section A		
1.	(b) TRUE	1
2.	'Ptrc'	1
3.	a. dictionary	1
4.	(c) !=	1
5.	a)False True	1
6.	(d)File is overwriting in ‘w’ & ‘w+’ mode.	1
7.	(b) INSERT	1
8.	d) Primary Key	1
9.	(c) T[3] = ‘thurs’	1
10.	(a) Alter.	1
11.	(c)readline() is used to read the contents of a file, one line at a time.	1
12.	c)desc, asc	1
13.	c)star	1
14.	b)1.0	1
15.	c)in	1
16.	c)connect()	1
17.	a) Both A and R are true and R is the correct explanation for A	1
18.	a) Both A and R are true and R is the correct explanation for A	1
Section B		

19.	STRING="WELCOME”
	NOTE = " "
	for S in range(0,8):
	if STRING[S]== ’E’:
	print(STRING(S))
	else:
	print (“NO”)
		1

20.	A **Trojan horse** is a program that contains hidden malicious functions. Trojan Horses trick users into installing them by appearing to be legitimate programs. Once installed on a system, they reveal their true nature and cause damage. The term **spam** means endless repetition of worthless text. In other words, unwanted messages or mails are known as Spam. Most spam is commercial advertising. In addition to wasting people's time, spam also eats up a lot of network bandwidth. **OR** Web address of the web page written on the address bar of the browser is known as the uniform resource locator (URL). A URL is a formatted text string used to identify a network resource on the Internet.	1

<table>
<tr><td></td><td>The host name or address substring identifies the host/server that holds the resource. Hosts names are sometimes called domain names. For example: www. School.com is a domain name and URL is http://www.school.com/index.html is URL.</td><td></td></tr>
<tr><td>21.</td><td>(a) [”Science”,10,”PRE”,30,”BOARD”]
(b) 15.0</td><td>1</td></tr>
<tr><td>22.</td><td>A table may have more than one such attribute/group of attributes that identifies a tuple uniquely, all such attribute(s) are known as Candidate Keys.
Table:Item
<table><tr><th>Ino</th><th>Item</th><th>Qty</th></tr><tr><td>I01</td><td>Pen</td><td>500</td></tr><tr><td>I02</td><td>Pencil</td><td>700</td></tr><tr><td>I04</td><td>CD</td><td>500</td></tr><tr><td>I09</td><td></td><td>700</td></tr><tr><td>I05</td><td>Eraser</td><td>300</td></tr><tr><td>I03</td><td>Duster</td><td>200</td></tr></table>In the above table Item, ItemNo can be a candidate key</td><td>2</td></tr>
<tr><td>23.</td><td>a) FTP – File Transfer Protocol
b) HTML – Hyper Text Transfer Protocol
c) PAN – Personal Area Network
d) GPRS - General packet radio service</td><td>2</td></tr>
<tr><td>24.</td><td>[20, 10, 40, 30, 60, 50]
OR
450 # 300
450 # 150
200 # 150</td><td>2</td></tr>
<tr><td>25.</td><td>This is because the column commission contains a NULL value and the aggregate functions do not take into account NULL values. Thus Command1 returns the total number of records in the table whereas Command2 returns the total number of non NULL values in the column commission.
OR
DROP TABLE, CREATE TABLE
DML :Data Manipulation Command
½ mark for each correct command
1 mark for correct full form</td><td>2</td></tr>
<tr><td colspan="3">SECTION C</td></tr>
</table>

26. **OUTPUT:** 1+2

a)

i)

Name	Designation	Salary
Rakesh Minhas	Manager	45000

b)(i)

Designation	Count(*)
Manager	2
Accountant	1
Clerk	2

(ii) AVG(Age)

34

(iii)

Name	Designation	Gender
Himani Singh	Clerk	F
Shreya Sharma	Clerk	F

(iv)

Designation
Manager
Accountant
Clerk

27. 3

```
def cnt_M():
    num=0
    f=open('MYNOTES.TXT','r')
    for line in f.readlines():
        if line[0]=='M':
            num=num+1
    print(num)
    f.close()
```

OR

```
def BIGWORDS():
    num=0
    f=open('CODE.TXT','r')
    data=f.read()
    words=data.split()
    for w in words:
        if len(w)>=7:
            num=num+1
    print(num)
    f.close()
```

Using any correct code giving the same result is also accepted

28. 2

a.

(i) SELECT * FROM WORKERS ORDER BY LASTNAME;

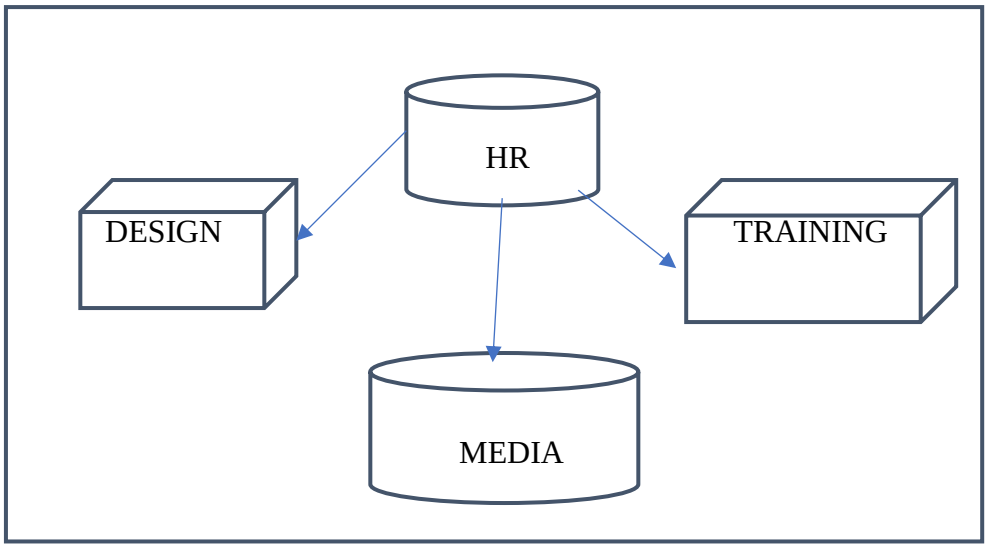
(ii) SELECT FIRSTNAME, W_ID, ADDRESS FROM WORKERS WHERE GENDER='M';

	(iii) SELECT MIN(SALARY) FROM DESIG WHERE DESIGNATION IN('MANAGER', 'CLERKS'); (iv) SELECT FIRSTNAME, SALARY FROM WORKERS, DESIG WHERE WORKERS.W_ID=DESIG.W_ID; b)show databases;	

29.	def ODDSum(NUMBERS):
	  s=0
	  for i in NUMBERS:
	  if i%2 !=0:
	  s=s+i
	  print(s)
	Using any correct code giving the same result is also accepted
		2

30.	**Using any correct code giving the same result is also accepted**
	def PUSH(Num):
	  s=[]
	  for x in Num:
	  if x%2==0 and x>0:
	  s.append(x)
	  if len(s)==0:
	  print("STACK EMPTY")
	  else:
	  print(s)
	OR
	def POP(cities):
	  #For empty stack
	  if(len(cities)==0):
	  print("Under flow")
	  else:
	  l=len(cities)
	  c=cities[l-1]
	  print(c)
	  cities.pop(l-1)
		2

	SECTION D	
31.	a. Most suitable place to install the server is HR Unit	2

	b.  c. Switch d. Ethernet Cable e. WAN as the given distance is more than range of LAN and MAN.	
32.	a) 4 3 b) b) Statement 1: con1.cursor() Statement 2: mycursor.execute(querry) Statement 3: con1.commit() OR a) SCHOOLbbbbCOM (2 marks for correct output) Note: Partial marking can also be given b) Statement 1: con1.cursor() Statement 2: mycursor.execute("select * from student where name like 'A%'") Statement 3: mycursor.fetchall()	2
33.	Difference between binary file and csv file: (Any one difference may be given) Binary file: • Extension is .dat • Not human readable • Stores data in the form of 0s and 1s CSV file • Extension is .csv • Human readable • Stores data like a text file Program: import csv def ADD():	2

```
        fout=open("record.csv","a",newline="\n")
        wr=csv.writer(fout)
        empid=int(input("Enter Employee id :: "))
        name=input("Enter name :: ")
        mobile=int(input("Enter mobile number :: "))
         lst=[empid,name,mobile] ---------1/2 mark
       wr.writerow(lst) ---------1/2 mark
          fout.close()
def COUNTR():
        fin=open("record.csv","r",newline="\n")
       data=csv.reader(fin)
       d=list(data)
       print(len(d))
       fin.close()
ADD()
COUNTR()
```

OR

Advantage of a csv file:

- It is human readable – can be opened in Excel and Notepad applications
- It is just like text file

Program:

```
import csv
def add():
        fout=open("furdata.csv","a",newline='\n')
        wr=csv.writer(fout)
        fid=int(input("Enter Furniture Id :: "))
        fname=input("Enter Furniture name :: ")
        fprice=int(input("Enter price :: "))
        FD=[fid,fname,fprice]
        wr.writerow(FD)
        fout.close()
def search():
        fin=open("furdata.csv","r",newline='\n')
        data=csv.reader(fin)
        found=False
        print("The Details are")
        for i in data:
                if int(i[2])>10000:
                        found=True
                        print(i[0],i[1],i[2])
        if found==False:
                print("Record not found")
        fin.close()
add()
print("Now displaying")
search()
```

34.	(i)DRINKCODE
	(ii) Degree -6, Cardinality -8
	(iii)
	a)insert into SOFTDRINK values(107, ‘ Khatta Aam’, 15.00, 100);
	b)update SOFTDRINK set price=price+price*0.03 where dname like ‘A%’;
	OR
	(iii)
	a)Delete from SOFTDRINK where calories=120;
	b)Alter table softdrink
	add FAT decimal(5,2);
		3

35.	**i)pickle** **ii)** F= open("STUDENT.DAT",'wb') iii) pickle.dump(L,F) iv) R = pickle.load(F)	4

Class: XII Session: 2022-23

Computer Science (083)

Sample Question Paper-I (Theory)

Maximum Marks: 70 **Time Allowed: 3 hours**

General Instructions:

1. This question paper contains five sections, Section A to E.
2. All questions are compulsory.
3. Section A have 18 questions carrying 01 mark each.
4. Section B has 07 Very Short Answer type questions carrying 02 marks each.
5. Section C has 05 Short Answer type questions carrying 03 marks each.
6. Section D has 03 Long Answer type questions carrying 05 marks each.
7. Section E has 02 questions carrying 04 marks each. One internal choice is given in Q35 against part c only.
8. All programming questions are to be answered using Python Language only.

	SECTION A	
1.	State True or False "Comments in Python begin with a "$" symbol."	1
2.	Find the valid identifier from the following a) My-Name b) True c) While d) S_name	1
3.	Which statement is correct for dictionary? (i) A dictionary is a ordered set of key: value pair (ii) each of the keys within a dictionary must be unique (iii) each of the values in the dictionary must be unique (iv) values in the dictionary are immutable	1
4.	Write the names of any two mutable data types available in Python.	1
5.	If the following code is executed, what will be the output of the following code? n="Trust yourself that you can do it and get it" print(name[2:-4:2])	1
6.	**Which of the following commands can be used to read "n" number of characters from a file using the file object <file>?** a) read(n) b) n = file.read() c) file.readline(n) d) file.readlines()	1
7.	Fill in the blank: _____ command is used to remove the database . (a) update (b)remove (c) alter (d)drop	1

8.	Which of the following command will use to add new column in the table from MYSQL database? (a) DELETE TABLE (b) DROP TABLE (c) REMOVE TABLE (d) ALTER TABLE	1

9.	Which of the following statement(s) would give an error after executing the following code?
	
	W=" Nothing is impossible, the word itself says 'I'm possible" # Statement 1
	print(W) # Statement 2
	S="Good" # Statement 3
	S[0]= ' ' # Statement 4
	S=S*"Good" # Statement 5
	
	(a) Statement 3
	(b) Statement 4
	(c) Statement 5
	(d) Statement 4 and 5
		1

10.	**In SQL, which command is used to SELECT only one copy of each set of duplicable rows** a) SELECT DISTINCT b) SELECT UNIQUE c) SELECT DIFFERENT d) All of the above	1
11.	Write the output of the following code fout=open("story.txt","w") fout.write("Welcome Python") fout.seek(5) **print(fout.tell( ))** **fout.close( )**	1
12.	A(n) in a table represents a logical relationship among a set of values. (a) Attribute (b) Key (c) Tuple (d) Entry	1

13.	Rearrange the following terms in increasing order of speedy medium of data transfer. Telephone line, Fiber Optics, Coaxial Cable, Twisted Paired Cable	1
14.	What will the following expression be evaluated to in Python? print(10.0 + 4 * (2 + 3.0)) (a) 14.75 (b)14.0 (c) 15 (d) 30.0	1
15.	The SQL built-in function _____ obtains the smallest value in a numeric column :	1
16.	Which connector is used for linking the database with Python code? (a) MySQL-connector (b) YesSQL: connector (c) PostSQL: connector (d) None of the above	1
Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as (a) Both A and R are true and R is the correct explanation for A		
(b) Both A and R are true and R is not the correct explanation for A (c) A is True but R is False (d) A is false but R is True		
17.	Assertion (A):- Python allows function arguments to have default values; if the function is calledwithout the argument, the argument gets its default value. Reasoning (R):- During a function call, the argument list first contains default argument(s) followed by positional argument(s).	1
18.	Assertion (A): A ***CSV file*** stores data in rows and the values in each row is separated with a ***separator***, also known as a ***delimiter.*** Reason (R): You cannot change the by default comma as a value separator.	1
SECTION B		

19.	Mr Tendulkar has written a code to generate Fibonacci series. but he is unbale to get the result / code is having errors. Rewrite the correct code and underline the corrections made.
	
	def Fibonacci(n):
	
	# Check if input is 0 then it will
	# print incorrect input
	if n < 0
	print("Incorrect input")
	
	# Check if n is 0
	# then it will return 0
	El if n == 0:
	return 0
	
	# Check if n is 1,2
	# it will return 1
	
	elif n == 1 or n == 2:
	return (1);
	
	els:
	return Fibonacci(n-1) + Fibonacci(n-2)
		2

20.	Mention any two characteristics of BUS Topology. OR Differentiate between the terms Domain Name and URL in the context of World Wide Web.	2
21.	If given A=2,B=1,C=3, What will be the output of following expressions: (A) print((A>B) and (B>C) or(C>A)) (B) print(A**B**C)	1 1
22.	Explain the use of 'Primary Key' in a Relational Database Management System. Give example to support your answer.	2
23.	(a) Write the full forms of the following: (i) FTP (ii) VoIP (b) What protocol in terms of networking?	2

24.	Predict the output of the Python code given below: Find the output of the following code: x = 20 def myfunc(): global x x = 10 print(x) myfunc() print(x,end="") OR Fill in the blanks to execute loop from 10 to 100 and 10 to 1 (i)for i in range(_____): print(i) (ii)for i in range(_____):print(i)	2
25.	Differentiate between Degree and Cardinality in the context of Relational Data Model. OR Write the names of any two commands of DDL and any two commands of DML in SQL.	2

SECTION C

26. Consider following table medicalstore and write perform the following query. 1+2

MedicineNo	MedicineName	MedCode	Quantity
5647	Saridon	141	75
5741	Paracetamol	142	44
3546	Nicip Plus	141	60
9541	Disprin	140	53
2025	Diclofenac	143	73
2783	Corex Syrup	141	97
8614	Psorid	142	48

Insert the following data into the attributes respectively in the given table medicalstore.
MedicineNo = 6647, MedicineName = "Dapsone", MedCode = 141 and Quantity = 55

(b) Write the output of the SQL queries (i) to (iv) based on the table:

Staff

Ecode	Name	Dept	DOB	Gender	Designation	Salary
101	Sunita	Sales	06-06-1995	F	Manager	25000
102	Neeru	Office	05-07-1993	F	Clerk	12000
103	Raju	Purchase	05-06-1994	M	Manager	26000
104	Neha	Sales	08-08-1995	F	Accountant	18000
105	Nishant	Office	08-10-1995	M	Clerk	10000
106	Vinod	Purchase	12-12-1994	M	Clerk	10000

(i) Select sum(Salary) from staff where Gender = 'F' and Dept = 'Sales';
(ii) Select Max(DOB), Min(DOB) from staff;
(iii) Select Gender, Count(*) from staff group by Gender;
(iv) Select Name from staff w
here salary>25000;

27.	Write a method in python to read lines from a text file Test.TXT and display those lines which start with the alphabets S. OR Write a function Count_word( ) in python to read the text file "story.txt" and count the number of times "vidyalaya" occurs in the file. For example if the file story.txt contains: "This is my vidyalaya. I love to play and study in my vidyalaya." the Count_word ( ) function should display the output as:"vidyalaya occurs 2 times".	3

28. (a) **Consider the tables given below which are linked with each other and maintains referential integrity.** 3

Table :Party

Partyid	Description	Costperperson
P101	Birthday	400
P102	Wedding	700
P103	Farewell	350
P104	Engagement	450

Table :Client

ClientId	ClientName	Address	Phone	NoOfGuest	PartyId
C101	A.K.Antony	A-151 Adarsh Nagar	99101956	80	P101
C102	Fauzia Aria	K-5/52 Vikas Vihar	981166568	500	P102
C103	Rashi Khanaa	D-6 Hakikat Nagar	981166568	50	P101
C104	S.K.Chandra	76-A/2 MG Colony Adarsh Avenue	65877756	100	P104

(i) Name the Primary keys in both the tables .

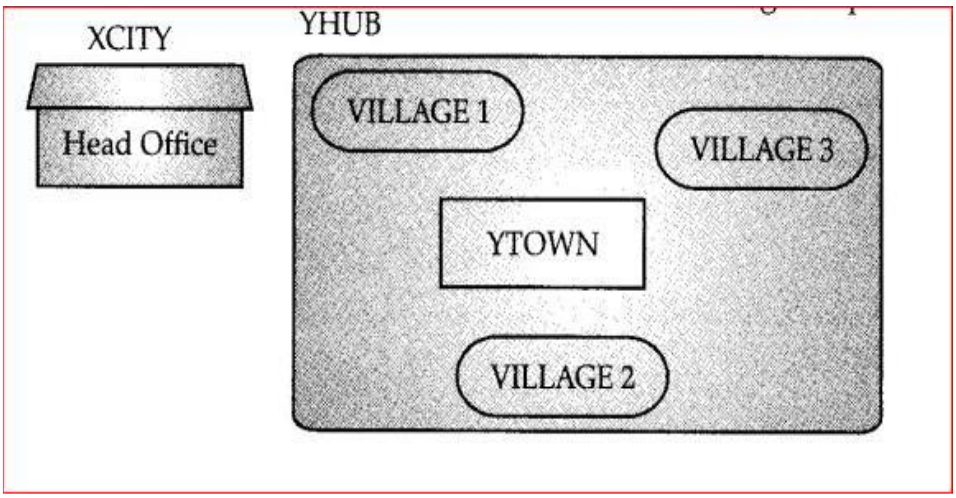
(ii) 'P101' data is present twice in column 'PartyId' in 'Client' table – Is there any discrepancy? Justify your answer.

With reference to the above given tables , Write commands in SQL for (iii) and (iv) and write output for (iv)

	(iii) To display Client names of clients, their phone numbers,PartyId and party description who will have number of guests more than 50 for their parties. (iv) To display Client Ids, their addresses, number of guests of those clients who have 'Adarsh' anywhere in their addresses. (b) Write the command to describe the table structure.	

29.	Write a function in **Display** which accepts a list of integers and its size as arguments and replaces elements having even values with its half and elements having odd values with twice its value . eg: if the list contains 5, 6, 7, 16, 9 then the function should rearranged list as 10, 3,14,8, 18	3
30	Write a function in python named PUSH(STACK, SET) where STACK is list of some numbers forming a stack and SET is a list of some numbers. The function will push all the EVEN elements from the SET into a STACK implemented by using a list. Display the stack after push operation. **OR** Write a function in python named POP(STACK) where STACK is a stack implemented by a list of numbers. The function will display the popped element after function call.	3
	SECTION D	

31	DVC India is a knowledge community aimed to uplift the standard of skills and knowledge in the society. It is planning to setup its training centres in multiple towns and villages of India with its head offices in the nearest cities. They have created a model of their network with a city, a town and 3 villages as given. As a network consultant, you have to suggest the best network related solution for their issues/problems raised in (i) to (v) keeping in mind the distance between various locations and given parameters	5



Shortest distance between various locations:

VILLAGE 1 To YTOWN	2 KM
VILLAGE 2 To YTOWN	1.2 KM
VILLAGE 3 To YTOWN	3 KM
VILLAGE 1 To VILLAGE 2	3.5 KM
VILLAGE 1 To VILLAGE 3	4.5 KM
VILLAGE 2 To VILLAGE 3	3.5 KM
CITY Head office to YHUB	30 KM

Number of computers iinstalled at various locations are as follows:

YTOWN	100
VILLAGE 1	10
VILLAGE 2	15
VILLAGE 3	15
CITY OFFICE	5

Note: * In Villages, there are community centres, in which one room has been given as training center to this organization to install computers. * The organization has got financial support from the government and top IT companies.

	1. Suggest the most appropriate location of the SERVER in the YHUB (out of the 4 locations), to get the best and effective connectivity. Justify your answer. 2. Suggest the best wired medium and draw the cable layout (location to location) to efficiently connect various locations within the YHUB. 3. Which hardware device will you suggest to connect all the computers within each location of YHUB? 4. Which server/protocol will be most helpful to conduct live interaction of Experts from Head office and people at YHUB locations? 5. Suggest a device/software and its placement that would provide data security for the entire network of the YHUB.	

32.) Write the output of the code given below: 2+3

Write the output of following python code

```
T="Happy New Year 2023"
L=len(T)
ntext=""
for i in range (0,L):
    if T[i].isupper():
        ntext=ntext+T[i].lower()
    elif T[i].isalpha():
        ntext=ntext+T[i].upper()
    else:
        ntext=ntext+"*"
print (ntext)
```

) The given program is used to connect with MySQL abd show the name of the all the record from the table “stmaster” from the database “oraclenk”. You are required to complete the statements so that the code can be executed properly.

```
import _____.connector__pymysql dbcon=pymysql._____(host=”localhost”, user=”root”,
_____=”sia@1928”)
if dbcon.isconnected()==False
        print(“Error in establishing connection:”) cur=dbcon._____()
query=”select * from stmaster”
cur.execute(_____)
resultset=cur.fetchmany(3)
for row in resultset:
      print(row)
dbcon._____()
```

OR

(a) Predict the output of the code given below:

```
def fun(s):
        k=len(s)
        m=" "
        for i in range(0,k):
        if(s[i].isupper()):
                m=m+s[i].lower()
        elif s[i].isalpha():
                m=m+s[i].upper()
        else:
                m=m+'bb'
        print(m)

    fun('school2@com')
```

(b)

Srishti is trying to connect Python with MySQL for her project. Help her to writethe python statement on the following:-

(i) Name the library, which should be imported to connect MySQL with Python.

(ii)Name the function, used to run SQL query in Python.

(iii) Write Python statement of connect function having the arguments values as : Host name :192.168.11.111

User : root

Password:

Admin

Database : MYPROJECT

33. 5

Sarthaq of class 12 is writing a program to search a name in a CSV file "MYFILE.csv". He has written the following code. As a programmer, help him to Successfully execute the given task.

```
import _________ # Statement 1
f = open("MYFILE.csv", _______) # Statement 2
data = _____________ ( f ) # Statement 3
nm = input("Enter name to be searched: ")
for rec in data:
if rec[0] == nm:
print (rec)
f._________( ) # Statement 4
```

(a) Name the module he should import in Statement 1.
(b) In which mode, Rohit should open the file to search the data in the file in Statement 2?
(c) Fill in the blank in Statement 3 to read the data from the file.
(d) Fill in the blank in Statement 4 to close the file.
(e) Write the full form of CSV

or

Srishti is making software on "Items & their prices" in which various records are to be stored/retrieved in STORE.CSV data file. It consists some records (Item & Price). She has written the following code in python. As a programmer, you have to help herto successfully execute the program.

```
import _____                                          # Statement-1 # Statement-2 # Statement-3
def AddItem(Item, Price) _____
    f=open("STORE.CSV",_____)
    fw=csv.writer(f) fw.writerow([Item,
     _____                                            # Statement-4

def ShowRecord():
    with open("STORE.CSV","r") as NI:NewItem=csv.
        _____(NI) for rec                             # Statement-5
        in NewItem:
            print(rec[0],"#",rec[1])

#main-code
AddItem("Sugar", 38.00)
AddItem("Rice", 48.50)                                # Statement-6
```

Q1. Which module should be imported in Statement-1.

A. pickle B. csv C. file D. text

Q2. Which file mode to be passed to add new record in Statement-3.
A. w+ B. w C. wb D. a

Q3. What should be written in Statement-4 to close the file?
A. close() B. fw.close() C. f.close() D. csv.close()

Q4. Which function to be used in Statement-5 to read the data from a csv file.
A. read() B. readline() C. readlines() D. reader()

Q5. Output after executing Statement-6 will be -

A. ("Sugar", "38.0")
("Rice", "48.50")

B. Sugar 38.0
Rice 48.0

C. Sugar, 38.0
Rice, 48.50

D. Sugar # 38.0
Rice # 48.50

SECTION -E

34	Write queries (a) to (d) based on the tables EMPLOYEE and DEPARTMENT givenbelow: Table: EMPLOYEE EMPID | NAME | DOB | DEPTID | DESIG | SALARY 120 | Alisha | 23-Jan-1978 | D001 | Manager | 75000 123 | Nitin | 10-Oct-1977 | D002 | AO | 59000 129 | Navjot | 12-Jul-1971 | D003 | Supervisor | 40000 130 | Jimmy | 30-Dec-1980 | D004 | Sales Rep | 131 | Faiz | 06-Apr-1984 | D001 | Dep Manager | 65000 Table: DEPARTMENT DEPTID | DEPTNAME | FLOORNO D001 | Personal | 4 D002 | Admin | 10 D003 | Production | 1 D004 | Sales | 3 a. To display the average salary of all employees, department wise. b. To display name and respective department name of each employee whose salary is more than 50000. c. (i) To display the names of employees whose salary is not known, in alphabetical order? (ii) identify most appropriate column to , which can be considered as MPrimary key	1+1+2

35	Mr Prathamesh is a python programmer .He has written a code (to searching record) and created binary file “student.dat” with rollno and name of the students. The file contains 05 records ,As a python expert help him to complete the following code based on the requirement given below :-
	
	import …….. #Statement 1
	roll = input('Enter roll number that you want to search in binary file :')
	file = open("student.dat", "……..") #Statement 2
	list = pickle……. #Statement 3
	file.close( )
	for x in list:
	if roll in x['roll']:
	print("Name of student is:", x['name'])
	break
	else:
	print("Record not found")
	(i) Which module should be imported in the programme ? (statement 1)
	(ii) Write the correct mode to open the file .
	(iii) Which statement should prathamesh fill in statement 3 to read the data from binary file
		1+1+2

Class: XII Session: 2022-23

Computer Science (083)

Sample Question Paper-I (Theory)

Maximum Marks: 70 **Time Allowed: 3 hours**

	SECTION A ***(1 mark to be awarded for every correct answer)***	
1.	State True or False – "Comments in Python begin with a "$" symbol" **Ans. FALSE**	1
2.	Which of the following is an invalid datatype in Python? **Ans:** c) While d) S_name	1
3.	Given the following dictionaries Ans (ii) each of the keys within a dictionary must be unique	1
4.	1/2 mark for each correct datatype.	1

5.	**Ans: (a) utyusl htyucnd tadg**	1
6.	**Ans: a) read(n)**	1
7.	**Ans: (c) drop**	1
8.	(b) ALTER TABLE	1
9.	Ans: (C) – Statement 5 Type Error: can't multiply sequence by non-int of type 'str'	1

10.	a) SELECT DISTINCT	1
11.	O/P 5	
12.	(c)Tuple	
13.	Telephone line, Twisted Pair Cable, Coaxial Cable, Fiber Optics	
14.	What will the following expression be evaluated to in Python? print (10.0 + 4 * (2 + 3.0)) **Ans:** (d) 30.0	
15.	Min() function	1
16.	(a)MySQL-connector	1
17	Ans (c) A is True but R is false	
18.	Ans (c) A is True but R is false	1
	SECTION B	
19.	Rao has written a code to input a number and check whether it is prime or not. His code is having errors. Rewrite the correct code and underline the corrections made.	2

```
def Fibonacci(n):

  # Check if input is 0 then it will
  # print incorrect input
  if n < 0:                  Colon was missing
      print("Incorrect input")

  # Check if n is 0
  # then it will return 0
  elif n == 0:               elif was not in proper format
      return 0

  # Check if n is 1,2
  # it will return 1
  elif n == 1 or n == 2:
      return 1               Semicolon should not be here

  else:                  else was not in proper format
      return Fibonacci(n-1) + Fibonacci(n-2)
```

(½ mark for each correct correction made and underlined.)

20.	*(1 marks for each correct* characteristics ***)*** **OR** **A domain name is a human-friendly text form of the IP address. URL is a string that represents the complete web address of any web page** *(1 mark for each correct point of difference)*	2
21.	(A) True (B) 2	1 1
22	A primary key is **a column -- or a group of columns -- in a table that uniquely identifies the rows of data in that table**. 1 marks for Correct definition 1 Marks for Correct example	2
23.	(a) Write the full forms of the following: **Ans:** **(i) FTP: File Transfer Protocol** **(ii) VoIP: Voice Over Internet Protocol** *(½ mark for every correct full form)* (b) network protocol is **an established set of rules that determine how data is transmitted between different devices in the same network** *(1 mark for correct answer)*	2
24.	Predict the output of the Python code given below: 10 10 (1 mark each for correct line of output.) Deduct ½ mark if output generated correctly but not placed in two lines) OR Fill in the blanks to execute loop from 10 to 100 and 10 to 1 (i)for i in range(10,101):print(i) (ii) For i in range(10,0,-1):print(i) 1 mark each for correct line .	2
25.	**Degree:** The number of attributes in the relation is known as degree of the relation **Cardinality:** The number of tuples in a relation is known as cardinality. **1 Marks for each correct answer** **OR** **DDL: ALTER, DROP** **DML: INSERT, UPDATE**	2

	Section –C (a) INSERT INTO medicalstore (MedicineNo, MedicineName, MedCode,Quantity) VALUES(6647, “Dapsone”, 141,55); ***(1 mark for correct Query)***	3
26	(b) (i) 43000 ii) Max (DOB) Min(DOB) 08-10-1995 05-07-1993 iii) Gender Count(*) F 3 M 3 (iv) Raju **(half marks for each correct output)**	1+2

27.	def display ():
	file = open("test.txt" , "r")
	lines = file.readlines()
	for l in lines:
	if l[0]== "S" or l[0] == "s":
	print(l)
	file.close()
		3

(½ mark for correctly opening and closing the file
½ for readlines()
½ mar for correct loop
½ for correct if statement
½ mark for correctly == operator
½ mark for displaying the correct output)

OR

```
def count_word():
    f = open("story.txt", "r")
    count = 0
    x = f.read()
    word = x.split()
    for i in word:
      if i == "vidyalaya":
         count = count + 1
     print ("my occurs", count, "times")
```

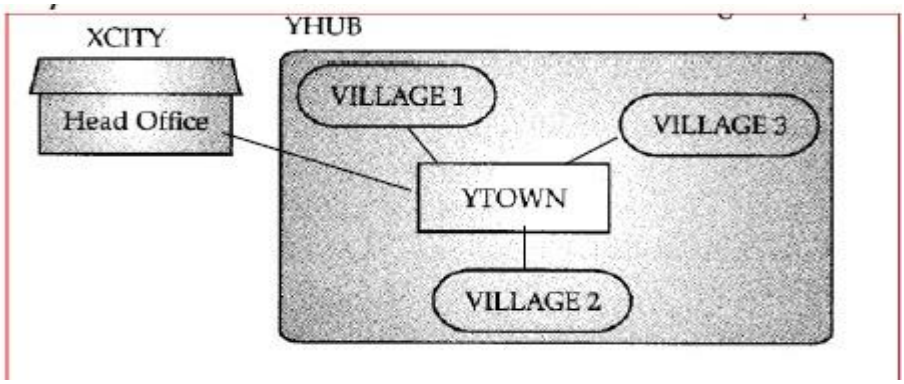
(½ mark for correctly opening and closing the file
½ for read() and split()
½ mark for correct loops
½ for correct if statement
½ mark for correctly incrementing counts
½ mark for displaying the correct output)

Note: Any other relevant and correct code may be marked

28.	(a) (i) Primary key (Table : Party) - PartyId Primary key (Table : Client) - ClientId (ii) There is no discrepancy. PartyId is not the Primary key in table Client, hence repetition is permissible (III) SELECT CLIENTNAME, PHONE, PARTY.PARTYID, DESCRIPTION FROM PARTY, CLIENT WHERE PARTY.PARTYID = CLIENT.PARTYID AND NOOFGUESTS> 50; (IV) SELECT CLIENTID, ADDRESS, NOOFGUESTS FROM CLIENT WHERE ADDRESS LIKE '%Adarsh%' **(½ mark for the correct output)** (b) desc tablename; - 1 Marks	3

29.	def Display (X, n):
	  for i in range(n):
	  if X[i] % 2 == 0:
	  X[i] /= 2
	  else:
	  X[i] *= 2
	  print (X)
	
	(½ mark for correct function header
	1 mark for correct loop
	1 mark for correct if statement
	½ mark for logic part /statement)
	
	Note: Any other relevant and correct code may be marked
		3

30.	def Push(STACK,SET):
	for i in SET :
	if i%2==0:
	STACK.append(i)
	print("Updated stack is :",STACK)
	
	OR
	def POP(STACK):
	if STACK==[] :
	print("Stack is empty")
	else:
	print(STACK.pop())
	
	½ marks for correct header
	1½ marks for correct logic
	½ mark for proper use of append or pop function
	½ mark for correct output
		3

31.	Answers: (i) YTOWN Justification:-Since it has the maximum number of computers. It is closet to all other locatios. 80-20 Network rule. (ii) Optical Fiber LAYOUT  (iii) Switch or Hub (iv) Video conferencing or VoIP or any other correct service/protocol (v) Firewall- Placed with the Server at YHUB. (1Marks for each correct answer)	5
32	(a) **hAPPY*nEW*yEAR*****	2+3

Ans.
```
import mysql.connector as pymysql
dbcon=pymysql.connect(host="localhost", user="root", passwd="sia@1928")
if dbcon.isconnected()==False
    print("Error in establishing connection:")
cur=dbcon.cursor()
query="select * from stmaster"
cur.execute(query)
resultset=cur.fetchmany(3)
for row in resultset:
    print(row)
dbcon.close()
```

(b)

Half Marks for each correct answer

OR

(a)

SCHOOLbb

SCHOOLbbbb

(1 Marks for each correct output line)

(b)

Ans. (i) import mysql.connector

(ii) execute (<sql query >)

(iii) mysql.connector.connect(host="192.168.11.111",user="root",passwd="Admin",databa se="MYPROJECT")

(1 Marks for each correct line /answer)

33	(a) csv. (b) "r"? (c) data = csv.reader(f) (d) f.close() (e) Comma Separated Values (1 Marks for each correct answer) Or 1. Ans: B. csv 2. Ans: D. a 3. C. f.close() 4. D. reader() 5. D.Sugar # 38.0 Rice # 48.50	5
34	(a) SELECT AVG(SALARY)FROM EMPLOYEE GROUP BY DEPTID; (b) SELECT NAME, DEPTNAME FROM EMPLOYEE, DEPARTMENT WHERE EMPLOYEE.DEPTID= EPARTMENT.DEPTIDAND SALARY>50000; (c) (i) SELECT NAME FROM EMPLOYEEWHERE SALARY IS NULL ORDER BY NAME (ii) Empid (1 marks for each correct query and 01 marks for correct column for primary key)	4

35	1. import pickle (1 marks) 2. file = open("student.dat", "rb") (1 marks) 3. list = pickle.load(file) (2 Marks)	4

COMPUTER NETWORKS

EVOLUTION OF NETWORKING

INTERNET

The **Internet** is a global network of billions of computers and other electronic devices.

ARPANET

The Advanced Research Projects Agency Network (ARPANET)

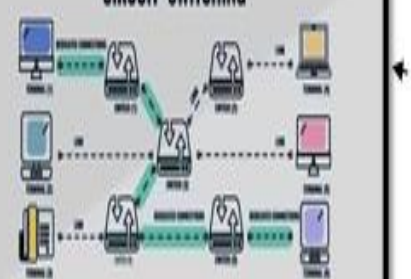
INTERSPACE

Interspace is a software that allows multiple users in a client-server environment to communicate with each other to send and receive data of various types such as data files, video, audio and textual data

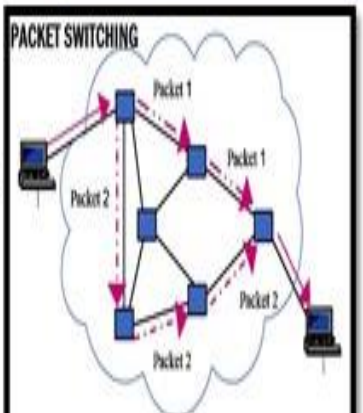
EVOLUTION OF NETWORKING

SWITCHING TECHNIQUES

CIRCUIT SWITCHING



PACKET SWITCHING

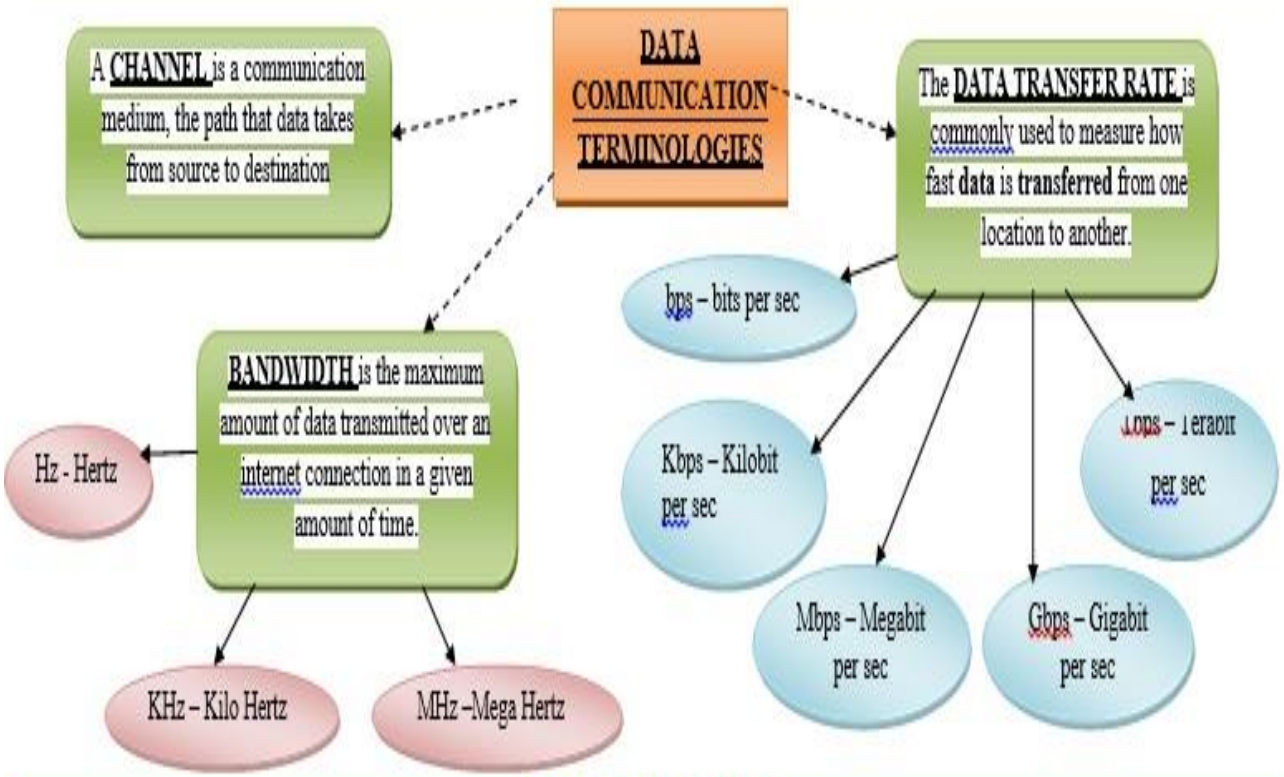


Differences Between Circuit & Packet Switching

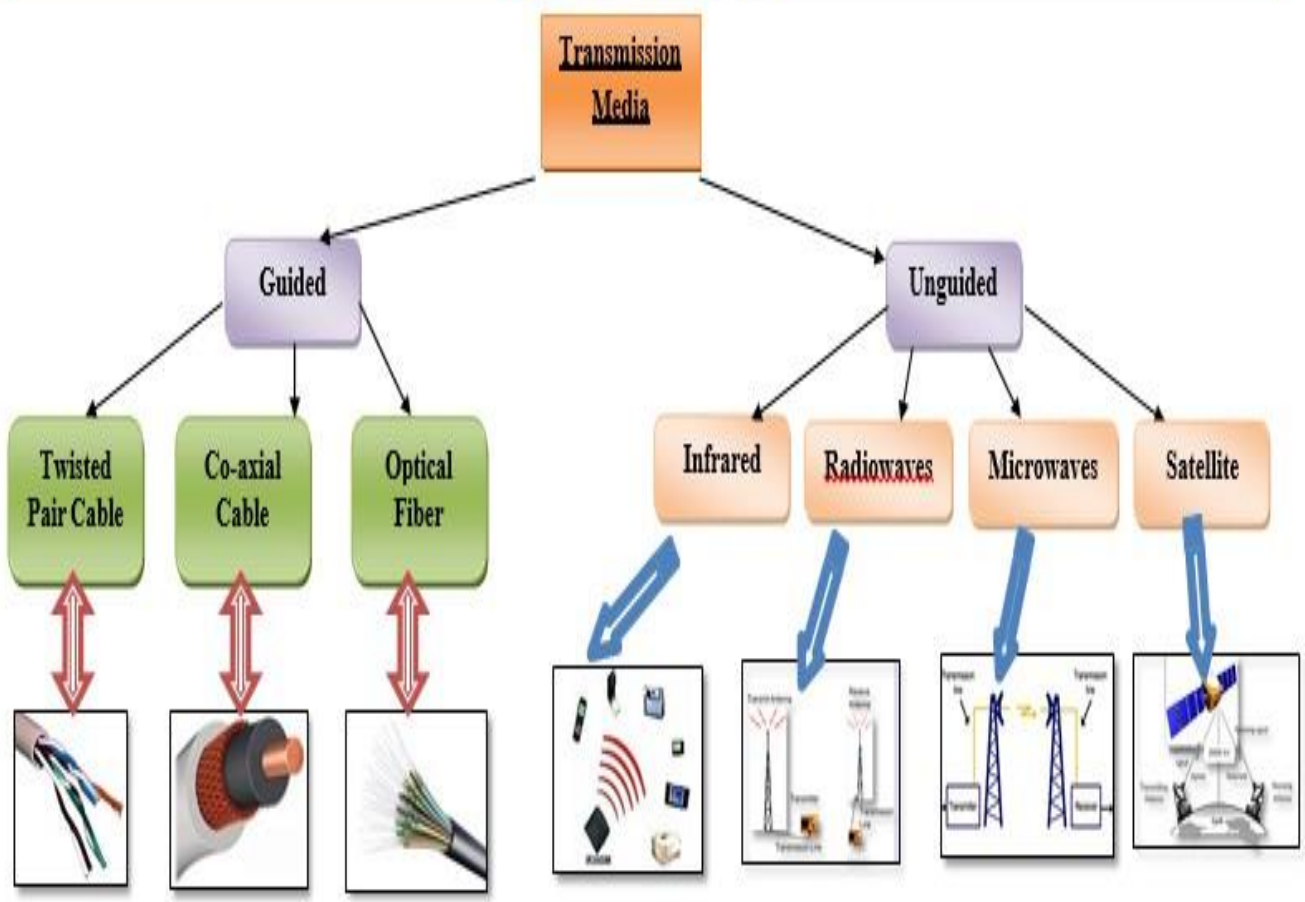
Circuit-switching	Packet-Switching
Guaranteed capacity	No guarantees (best effort)
Capacity is wasted if data is bursty	More efficient
Before sending data establishes a path	Send data immediately
All data in a single flow follow one path	Different packets might follow different paths
No reordering; constant delay; no pkt drops	Packets may be reordered, delayed, or dropped

25

DATA COMMUNICATION TERMINOLOGIES



TRANSMISSION MEDIA



NETWORK DEVICES

MODEM – (modulator-demodulator), a device that makes it possible for computers to communicate with one another without being directly connected to each other.

RJ45 Connector – A registered jack (RJ) is a standardized physical network interface for connecting telecommunications or data equipment.

ROUTER – The router is a physical or virtual internetworking device that is designed to receive, analyze, and forward data packets between computer networks.

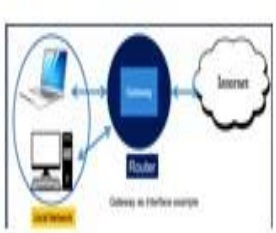
ETHERNET CARD – An **Ethernet card** is the communications hub for your computer; it connects to a **network** using a **network** cable.

Network Devices

WiFi CARD – It receives the **wireless** signal and communicates with the **wireless** network, enabling you to access the Web with your laptop.

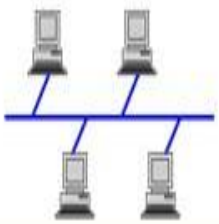
SWITCH – A **switch** is a device in a computer **network** that connects other devices together.

GATEWAY – A **gateway** is a **network** node that forms a passage between two **networks** operating with different transmission protocols.



NETWORK TOPOLOGIES

BUS – A **bus topology** is a **topology** for a Local Area **Network** (LAN) in which all the nodes are connected to a single cable



STAR – A **star topology** is a **topology** for a Local Area **Network** (LAN) in which all nodes are individually connected to a central connection point, like a hub or a switch.

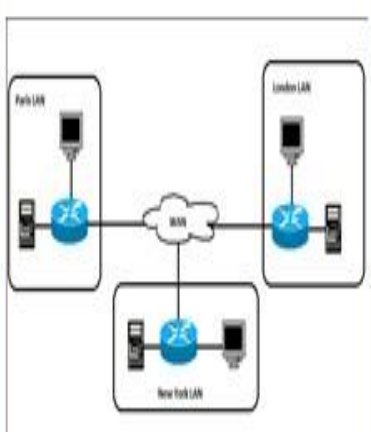
TREE – A **tree topology** is a special type of structure where many connected elements are arranged like the branches of a **tree**

NETWORK TOPOLOGIES

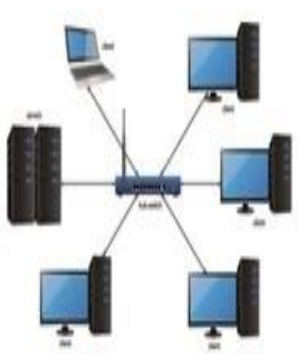
NETWORK TYPES

PAN – Personal Area Network

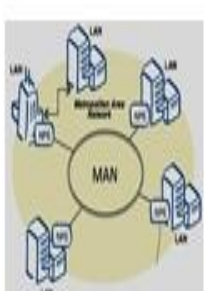
WAN – Wide Area Network

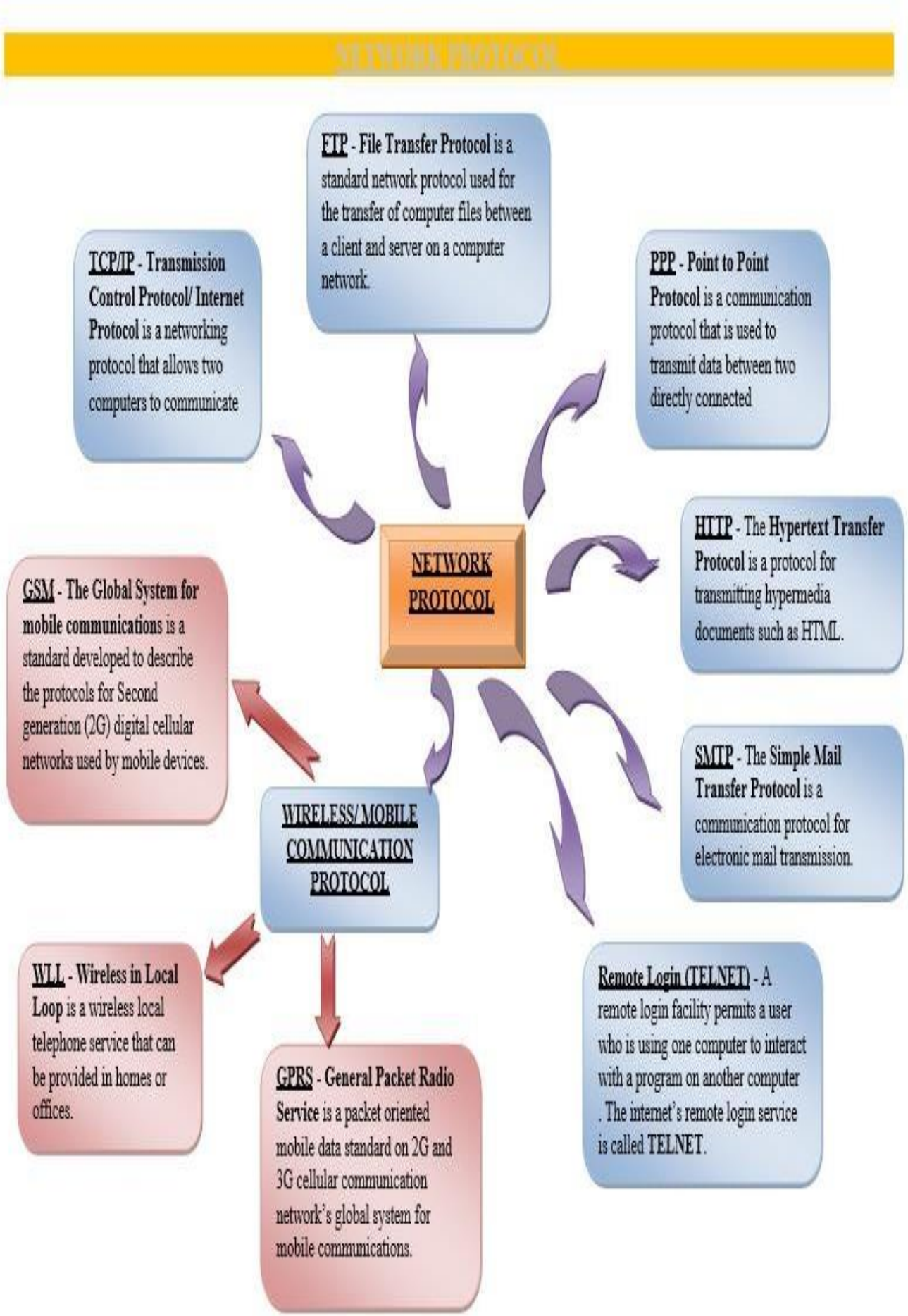


LAN – Local Area Network



MAN – Metropolitan Area Network



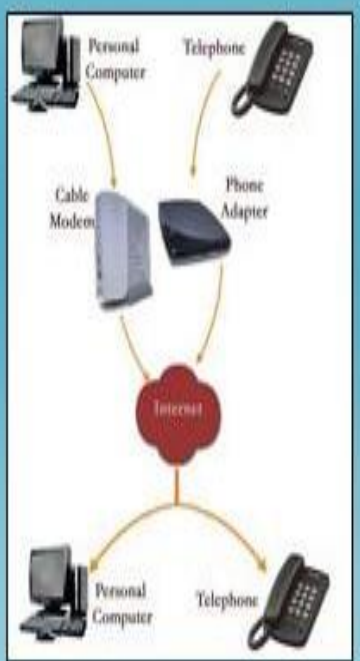

NETWORK PROTOCOL
FTP - File Transfer Protocol is a standard network protocol used for the transfer of computer files between a client and server on a computer network.
TCP/IP - Transmission Control Protocol/ Internet Protocol is a networking protocol that allows two computers to communicate
PPP - Point to Point Protocol is a communication protocol that is used to transmit data between two directly connected
HTTP - The Hypertext Transfer Protocol is a protocol for transmitting hypermedia documents such as HTML.
SMTP - The Simple Mail Transfer Protocol is a communication protocol for electronic mail transmission.
Remote Login (TELNET) - A remote login facility permits a user who is using one computer to interact with a program on another computer . The internet's remote login service is called TELNET.
WIRELESS/MOBILE COMMUNICATION PROTOCOL
GSM - The Global System for mobile communications is a standard developed to describe the protocols for Second generation (2G) digital cellular networks used by mobile devices.
WLL - Wireless in Local Loop is a wireless local telephone service that can be provided in homes or offices.
GPRS - General Packet Radio Service is a packet oriented mobile data standard on 2G and 3G cellular communication network's global system for mobile communications.

COMPARISON BETWEEN 1G, 2G, 3G, 4G AND 5G

Technology / Features	*1G*	*2/2.5G*	*3G*	*4G*	*5G*
Start/ Deployment	1970/ 1984	1980/ 1999	1990/ 2002	2000/ 2010	2010/ 2015
Data Bandwidth	2 kbps	14.4-64 kbps	2 Mbps	200 Mbps to 1 Gbps for low mobility	1 Gbps and higher
Standards	AMPS	2G: TDMA, CDMA, GSM 2.5G: GPRS, EDGE,1xRTT	WCDMA, CDMA-2000	Single unified standard	Single unified standard
Technology	Analog cellular technology	Digital cellular technology	Broad bandwidth CDMA, IP technology	Unified IP and seamless combination of broadband, LAN/WAN/	Unified IP and seamless combination of broadband,

VoIP – Voice Over Internet Protocol

It is a technology that allows you to make voice calls using a broadband internet connection instead of a regular phone line.

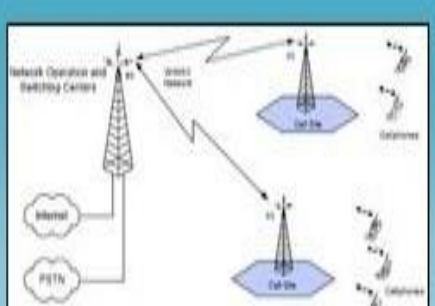


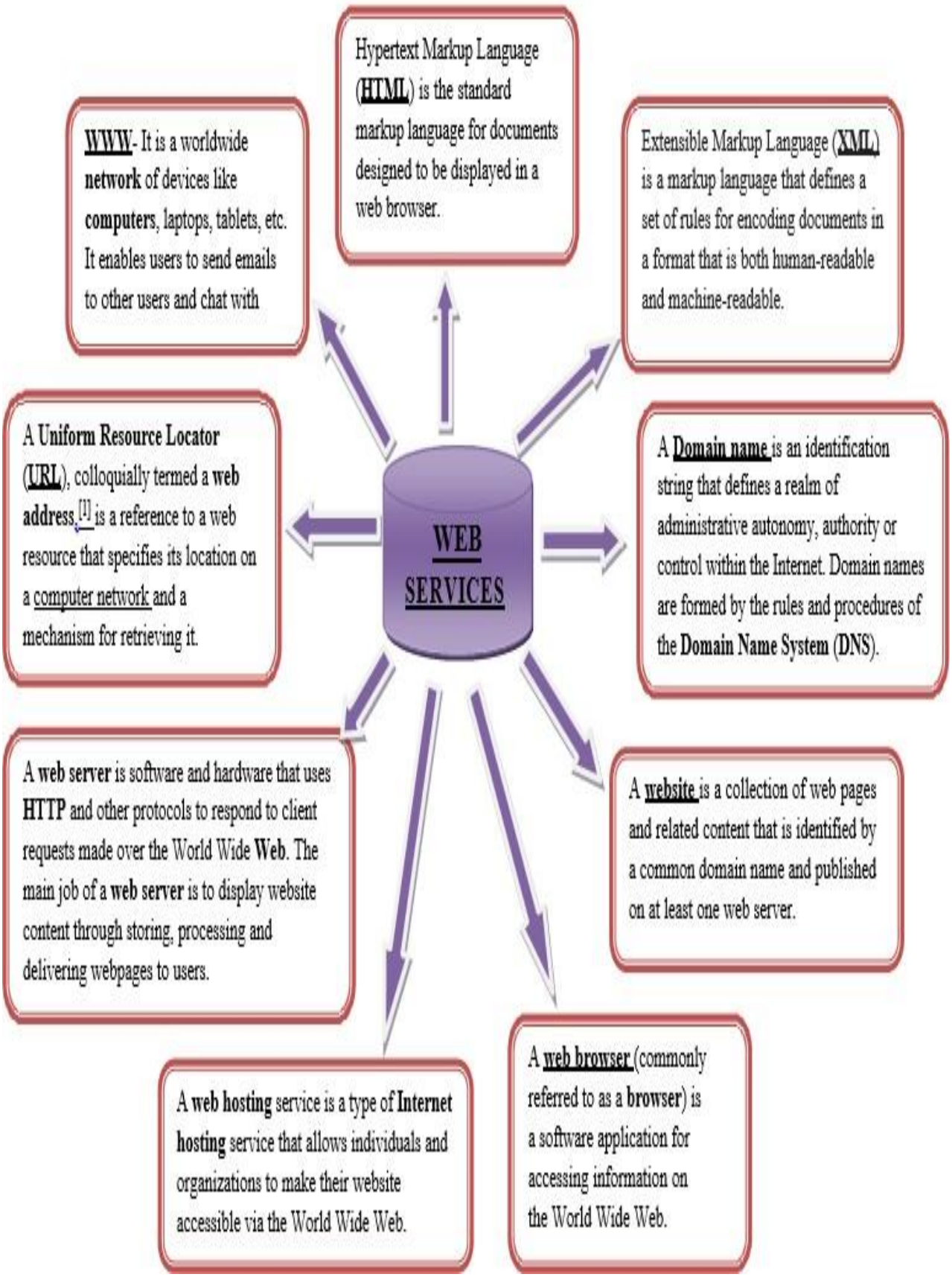
WiFi – Wireless Fidelity

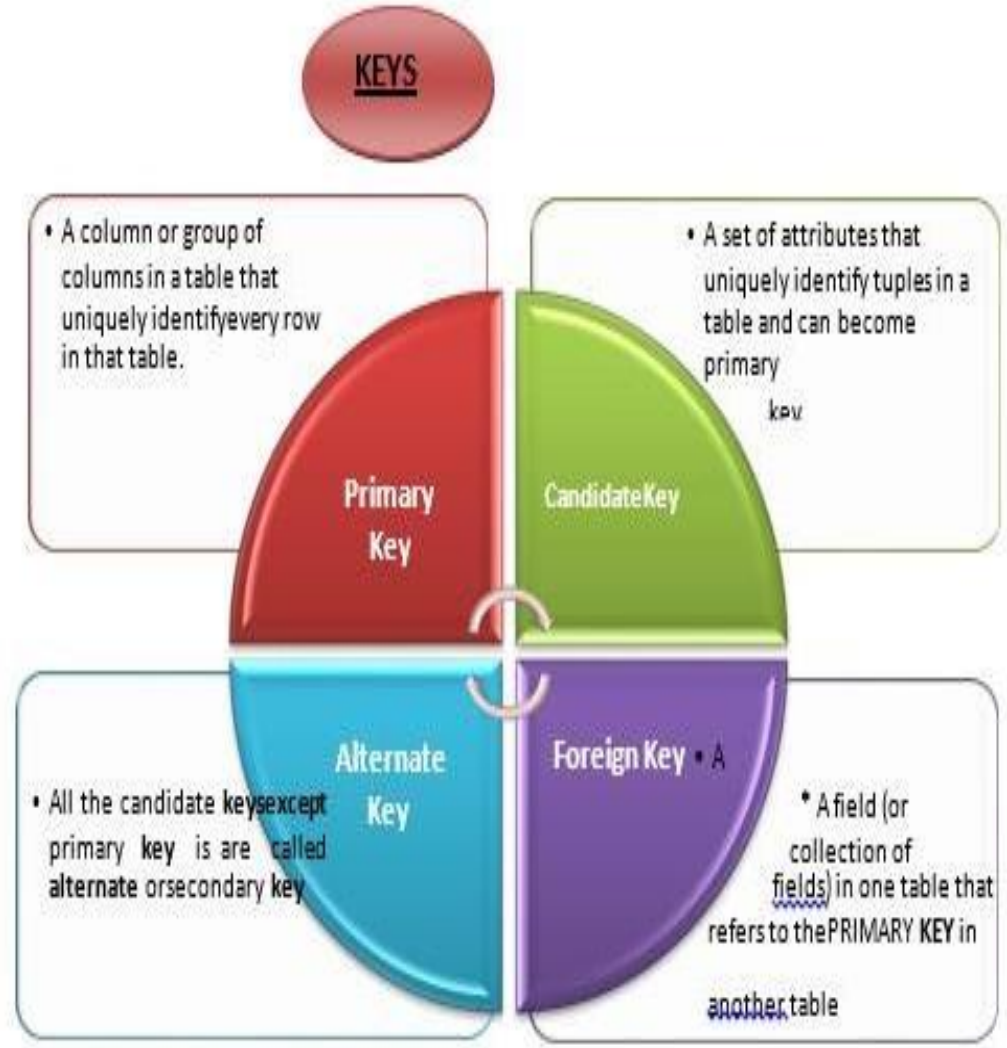
Wifi is a universal wireless networking technology that utilizes radio frequencies to transfer data.

WiMax –

WiMax stand for **Worldwide Interoperability for Microwave Access (AXess)**, and it is a technology for point to multipoint wireless networking. It provides high speed data over a wide area.

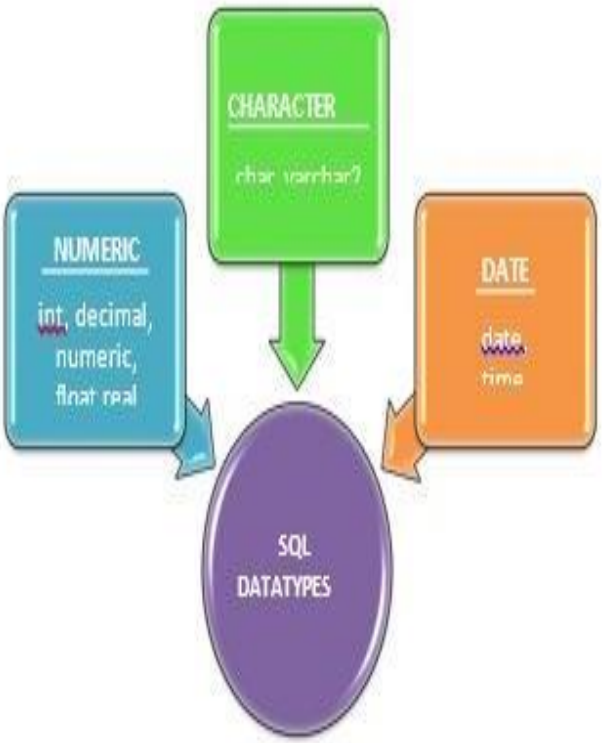



WEB SERVICES
WWW- It is a worldwide network of devices like computers, laptops, tablets, etc. It enables users to send emails to other users and chat with
Hypertext Markup Language (HTML) is the standard markup language for documents designed to be displayed in a web browser.
Extensible Markup Language (XML) is a markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable.
A Uniform Resource Locator (URL), colloquially termed a web address,[1] is a reference to a web resource that specifies its location on a computer network and a mechanism for retrieving it.
A Domain name is an identification string that defines a realm of administrative autonomy, authority or control within the Internet. Domain names are formed by the rules and procedures of the Domain Name System (DNS).
A web server is software and hardware that uses HTTP and other protocols to respond to client requests made over the World Wide Web. The main job of a web server is to display website content through storing, processing and delivering webpages to users.
A website is a collection of web pages and related content that is identified by a common domain name and published on at least one web server.
A web hosting service is a type of Internet hosting service that allows individuals and organizations to make their website accessible via the World Wide Web.
A web browser (commonly referred to as a browser) is a software application for accessing information on the World Wide Web.

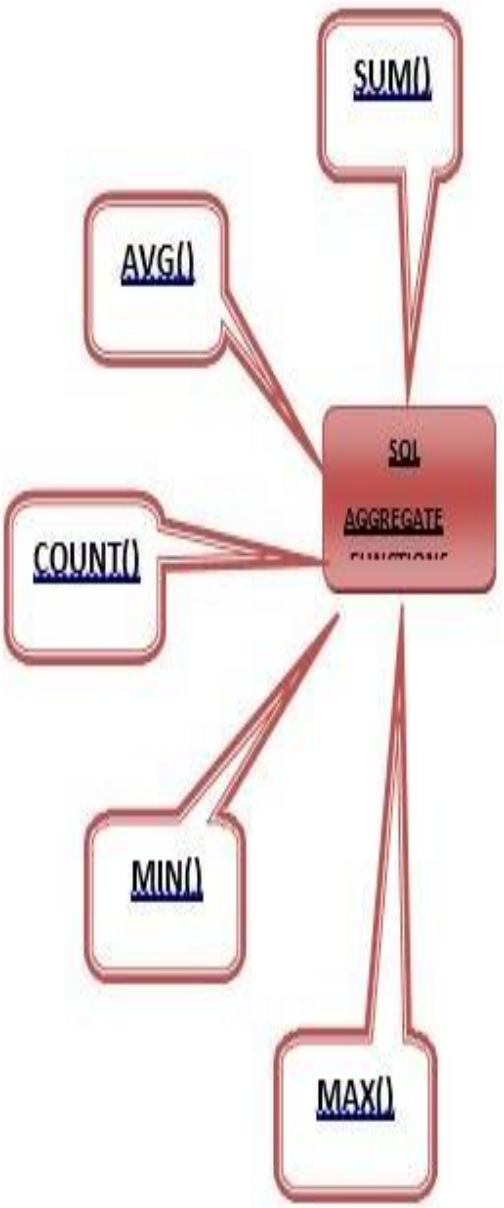


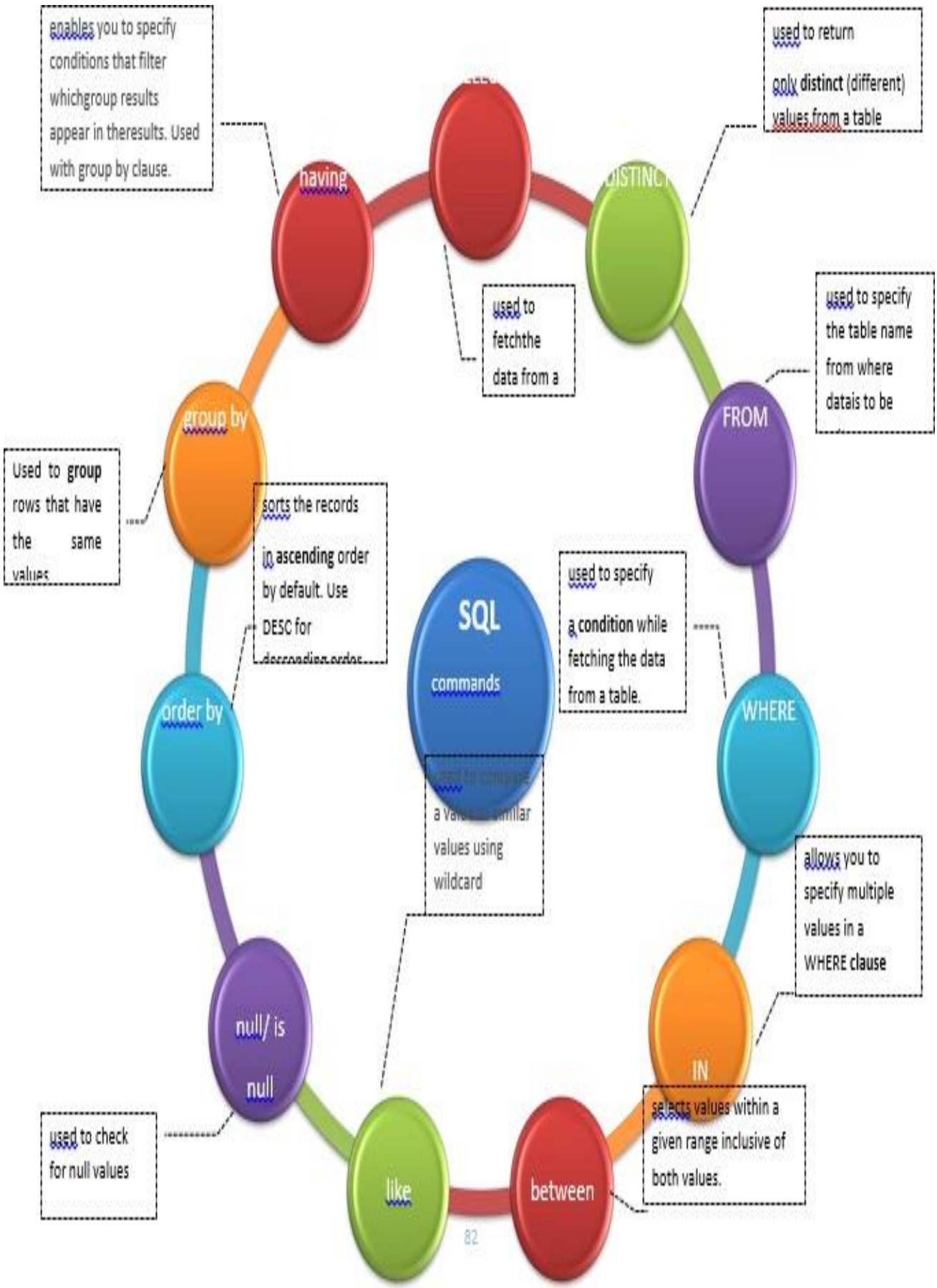
A data definition language (DDL) is a language used to define data structures and modify data.

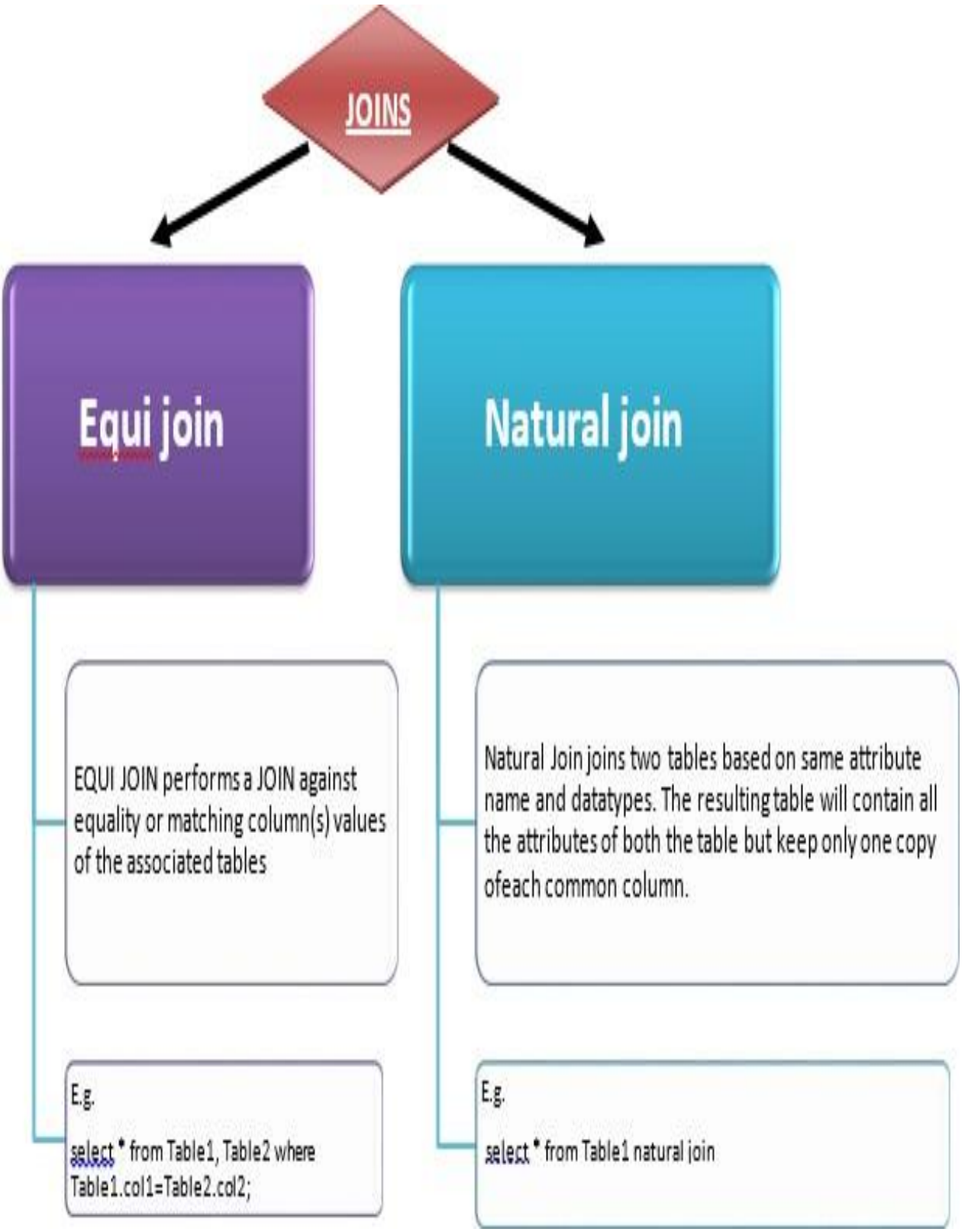
A data manipulation language (DML) is a language used for adding (inserting), deleting, andmodifying (updating) data in a database.



DDL	DML
It is Data Definition Language	It is Data Manipulation Language
These are used to define data structure	It is used to manipulate the existing databases.
It is used to define database structure or schema	It is used for managing data within schema objects
Commands are: CREATE, ALTER, DROP, TRUNCATE, RENAME	Commands are: SELECT, INSERT, DELETE, UPDATE, MERGE, CALL
It works on whole table	It works on one or more rows
It do not have a where clause to filter	It have where clause to filter records
Changes done by DDL commands cannot be rolled back	Changes can be rolled back
It is not further classified.	It is further classified as procedural and non procedural DML's
Example:- drop table tablename;	Select * from employee




enables you to specify conditions that filter whichgroup results appear in theresults. Used with group by clause.
having
used to return only distinct (different) values from a table
DISTINCT
used to fetchthe data from a
used to specify the table name from where datais to be
FROM
group by
Used to group rows that have the same values
sorts the records in ascending order by default. Use DESC for
SQL commands
used to specify a condition while fetching the data from a table.
WHERE
order by
a value similar values using wildcard
allows you to specify multiple values in a WHERE clause
IN
null/ is null
selects values within a given range inclusive of both values.
used to check for null values
like
between


JOINS
Equi join
Natural join
EQUI JOIN performs a JOIN against equality or matching column(s) values of the associated tables
Natural Join joins two tables based on same attribute name and datatypes. The resulting table will contain all the attributes of both the table but keep only one copy ofeach common column.
E.g.
select * from Table1, Table2 where Table1.col1=Table2.col2;
E.g.
select * from Table1 natural join