

केन्द्रीय विद्यालय संगठन, जयपुर संभाग

KENDRIYA VIDYALAYA SANGATHAN, JAIPUR REGION



**STUDENT SUPPORT
MATERIAL
CLASS: 12
SESSION: 2022-23**

**COMPUTER
SCIENCE**



PYTHON





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Syllabus

Computer Science

CLASS-XII

Code No.

083

2022-23

1. Prerequisites

Computer Science- Class XI

2. Learning Outcomes

Student should be able to

- apply the concept of function.
- explain and use the concept of file handling.
- use basic data structure: Stacks
- explain basics of computer networks.
- use Database concepts, SQL along with connectivity between Python and SQL.

3. Distribution of Marks:

Unit No.	Unit Name	Marks	Periods	
			Theory	Practical
I	Computational Thinking and Programming - 2	40	70	50
II	Computer Networks	10	15	---
III	Database Management	20	25	20
	Total	70	110	70

4. Unit wise Syllabus

Unit I: Computational Thinking and Programming - 2

- Revision of Python topics covered in Class XI.
- Functions: types of function (built-in functions, functions defined in module, user defined functions), creating user defined function, arguments and parameters, default parameters, positional parameters, function returning value(s), flow of execution, scope of a variable (global scope, local scope)
- Introduction to files, types of files (Text file, Binary file, CSV file), relative and absolute paths
- Text file: opening a text file, text file open modes (r, r+, w, w+, a, a+), closing a text file, opening a file using with clause, writing/appending data to a text file using write() and writelines(), reading from a text file using read(), readline() and readlines(), seek and tell methods, manipulation of data in a text file

- Binary file: basic operations on a binary file: open using file open modes (rb, rb+, wb, wb+, ab, ab+), close a binary file, import pickle module, dump() and load() method, read, write/create, search, append and update operations in a binary file
- CSV file: import csv module, open / close csv file, write into a csv file using csv.writer() and read from a csv file using csv.reader()
- Data Structure: Stack, operations on stack (push & pop), implementation of stack using list.

Unit II: Computer Networks

- Evolution of networking: introduction to computer networks, evolution of networking (ARPANET, NSFNET, INTERNET)
- Data communication terminologies: concept of communication, components of data communication (sender, receiver, message, communication media, protocols), measuring capacity of communication media (bandwidth, data transfer rate), IP address, switching techniques (Circuit switching, Packet switching)
- Transmission media: Wired communication media (Twisted pair cable, Co-axial cable, Fiber-optic cable), Wireless media (Radio waves, Micro waves, Infrared waves)
- Network devices (Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway, WIFI card)
- Network topologies and Network types: types of networks (PAN, LAN, MAN, WAN), networking topologies (Bus, Star, Tree)
- Network protocol: HTTP, FTP, PPP, SMTP, TCP/IP, POP3, HTTPS, TELNET, VoIP
- Introduction to web services: WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML), domain names, URL, website, web browser, web servers, web hosting

Unit III: Database Management

- Database concepts: introduction to database concepts and its need.
- Relational data model: relation, attribute, tuple, domain, degree, cardinality, keys (candidate key, primary key, alternate key, foreign key)
- Structured Query Language: introduction, Data Definition Language and Data Manipulation Language, data type (char(n), varchar(n), int, float, date), constraints (not null, unique, primary key), create database, use database, show databases, drop database, show tables, create table, describe table, alter table (add and remove an attribute, add and remove primary key), drop table, insert, delete, select, operators (mathematical, relational and logical), aliasing, distinct clause, where clause, in, between, order by, meaning of null, is null, is not null, like, update command, delete command, aggregate functions (max, min, avg, sum, count), group by, having clause, joins: cartesian product on two tables, equi-join and natural join
- Interface of python with an SQL database: connecting SQL with Python, performing insert, update, delete queries using cursor, display data by using fetchone(), fetchall(), rowcount, creating database connectivity applications.

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Unit I: Computational Thinking and Programming – 2

Python Revision Tour

Developer :- Python Programming language was developed by **Guido Van Roussum** in early 1990s, its name is taken from a famous circus **“Monty Python Flying Circus”**

Python IDE(Integrated Development Environment):- It is a software that provides an environment where a programmer can develop python program. There are various IDE available for example:- IDLE(Integrated Development Learning Environment), Sublime, Atom,Pycharm, Canopy, Tonney etc

Python is a case-sensitive language. All the commands are written in small letters. It differentiate between Capital letter and small letter of same character. For example **Computer** and **computer** are considered two different words. Capital letters are always treated smaller then lower letters. For example ‘Z’ is smaller then ‘a’.

Python Data Types :- int, float, complex, bool,None

Python Sequences :- String, Tuple, List, Dictionary and Set

Python control statement:- if , if else , while and for

Python loop :- while and for are two popular loop. Loop is also called iteration

Python variables/identifiers/function naming rules :- All name must start with alphabets. No special characters except (_) underscore are allowed. All the keyword and reserve words of python language cannot be used as variable name.

Commonly used methods of python :-

Method and operators	Description	Example
max() and min()	Finds maximum value	max([56,34,87,67,5]) output:- 87 max(“computer”) output:- u max([“Yuppi”, “apple”]) output :- apple
sorted()	Return sorted sequence	L=sorted([8,2,1]) Values in L is [1,2,8] L=sorted(“comp”) Values in L [‘c’,‘m’,‘o’,‘p’]
id()	Return id of object	D={} id(D) It wil return the id of D
sum()	It calculate total of values	sum((67,33)) returns 100

chr()	Return corresponding character of a given values A-Z means 65 to 90 a-z means 97 to 122 0 to 9 means 48 to 57	chr(65) return 'A' chr(97) return 'a' chr(48) return '0'
ord()	Return ascii values of one character	ord('A') return 65 ord("0") return 48
abs()	Return absolute value in int	abs(-45) return 45
fabs()	Return absolute value in float	fabs(-45) return 45.0
ceil()	Return next rounded value	ceil(4.2) return 5.0
pow()	Return a^b	pow(10,2) return 100
len()	Return length of a sequence	len({1:3,2:3}) return 2
range(start,stop,step)	It generates range of values it takes minimum one and maximum 3 parameters default start is 0 and default step is 1. stop is compulsory	for x in range(5) generates 0 1 2 3 4 for x in range(0,5,1) give same as above for x in range(-3,-7,-1) give -3 -4 -1
in and not in Membership operator	Return True if object if available in sequence It is used for searching.	'a' in "aeiou" return True 10 in [12,43,78] return False
is and is not identity operator	It checks similarity of two object and return True if both are same is not return True if both are not same.	10 is 10 return True True is True return True id(a) is id(b) return True if a and b are same.
[] Slicing operator	It takes 3 parameters separated by : All parameters are optional [start:stop:step]	"champ"[0] return c [56,23,54][1] return 23 "champ"[0:3] return "cha"

	Default start :- 0	"champ"[::-1] return "pmahc"
	Default stop :- end	"champ"[-1::-1] return "pmahc"
	Default step :- 1	"champ"[0::-1] return "c"
		"champ"[:2] return "ca"

Python String:- String is sequence of characters. It can be created using pair of single quote (') or double quote ("). Pair of three single quote or three double quotes are used to create multiline string.

String is immutable and never support '=' assignment operator for modifying its content.

Methods	Description	Example
S.lower()	Return a copy of the string S converted to lowercase	"HELLO".lower() return "hello"
S.upper()	Return a copy of S converted to uppercase	"hello".upper() return "HELLO"
S.capitalize()	Make the first character have upper case and the rest lower case	"HELLO".capitalize() return "Hello"
S.islower()	Return True if all cased characters in S are lowercase	"wagonR".islower() returns False
S.isupper()	Return True if all cased characters in s are uppercase	"HI".isupper() return True
S.istitle()	Return True if all words of string starts with Capital letters rest with lower	"The Times Of India".istitle() return True
S.split()	Return list of strings all separated by space or any specified character	"times of inda".split() return ["times", "of", "india"] "abc@pink@city".split("@") return ["abc", "pink", "city"] "times of india".split("es") return ["tim", "of india"]
S.join(S1)	Fills S between each character of S1 It can also be used with list or tuple of strings	"hi".join("bye") will return "bhiyhie" "-".join(["one", "two", "three"]) Return "one-two-three"
S.endswith(S1)	Return True if S ends with S1	"women".endswith("men") return True
S.strip() S.lstrip() S.rstrip()	Removes leading and trailing spaces, if any Removes leading spaces only, if any Removes trailing spaces only, if any	" s ".strip() return "s" " s ".lstrip() return "s " " s ".rstrip() return " s"

S.isdigit()	Returns True if S contains only digits	"345".isdigit() return True
S.isalpha()	Return True if S contains only alphabets	"test".isalpha() return True "test123".isalpha() return False
S.isalnum()	Return True if S contains alphabet, digit or mixture of both.	"abc123".isalnum() return True "abc".isalnum() return True "123".isalnum() return True "abc-123".isalnum() return False
S.find(S1)	Return index number of first occurrence of S1 otherwise -1	"gabbar singh".find("b") return 2 "babbar".find("singh") return -1

Python tuple :- It is immutable ordered sequence. It does not support the assignment operator for changing the value stored in it.

Methods	Description	Example
index(object)	It return index number of given object otherwise raise ValueError	T=(34,56,34,65) T.index(34) return 0 T.index(50) Raise ValueError
count(object)	It returns the total occurrence of given object	(2,5,3,2,7,2).count(s) return 3

NOTE:- BOTH index() and count() are also supported by string and list.

Python List :- It is mutable ordered sequence. We can change the object stored in it using = assignment

Methods	Description	Example
L.append(Value)	It adds object at the last of the list.	L=[1,3] L.append(2) will result [1,3,2]
L.insert(index,value)	It adds object at the given index number	L=[]
L.pop()	It removes object from the end of the list. Return IndexError if list is empty.	[1,3,2] L.insert(0,4) will result [4,1,3,2]
L.remove(Value)	It removes the given value and returns None. if the value is not found then it return ValueError	L=[4,7,4,3] L.remove(7) will result [4,4,3]
L.clear()	It removes all the values of list	Empty list will be returned
L1.extend(L2)	It expand the size of L1 adding all values of L2	L1=[1,2,3] L2=[4,5] L1.extend(L2) will result [1,2,3,4,5]
L.Copy()	Copy one list into another	L1=L2.copy() it will copy L2 into L1
L.reverse()	It reverses the order of all values of list.	L=[4,90,1] L.reverse() will change the list to [1,90,4]

L.sort()	It can arrange the list in both ascending and descending order.	L=[45,23,7] L.sort(reverse=False) will make [7,23,45] L.sort(reverse=True) will make [45,23,7]
-----------------	---	--

Python Dictionary :- It is an unordered, mutable sequence. It is a combination of key-value pairs.

Methods	Description	Example
<u>items()</u>	Return set of key and value pair	for x,y in {1:10,2:20}.items(): print(x,y) output: 1,10 2,20_
<u>keys()</u>	<u>Return set of keys only</u>	for x in {1:10,2:20}.keys(): print(x) output: 1 2_
<u>values()</u>	Return set of values only	for x in {1:10,2:20}.values(): print(x) output: 10 20_
<u>fromkeys()</u>	Crates a dictionary from tuple or list with default value for all key	T=(1,2) d.fromkeys(T) will create dictionary {1:None,2:None} d.fromkeys(T,100) will give {1:100,2:100}
<u>pop(key)</u>	Removes given keys along its value	D1={1:10,2:20} D1.pop(1) will return 10 and remove 1:10
<u>popitem()</u>	Removes and return some key-value pair	D1={1:10,2:20} D1.popitem() will remove 2:20 and (2,20)
<u>get()</u>	Return the value of a given key, it return None if not found.	D1={1:10,2:20} D1.get(2) will return 20
<u>clear()</u>	Delete all keys with valus	D1.clear() will make D1 empty
<u>copy()</u>	Copy a dict	D1=d2.copy()
<u>D.update(D1)</u>	It adds all the contents of D1 into D. if any key is same in both the old one is updated	D1={1:34,3:90} D2={2:20} D1.update(D1) will change D1 as {1:34,2:20,3:90} if D2 ={ 3:100} then D1.update(D2) will change D1 as {1:34, 3:100}
<u>setdefault()</u>	It works like get() if key is available otherwise it will add the new key value pair	D1={1:10,2:20} D1.setdefault(2:300) will return values 20 as its key is 2

		But D1.setdefault(3:300) will add this key values into D1 as this key is not present in D1
--	--	--

Python Functions

Python Function:- Functions is a block of code that is identified by its name. A function can be executed by calling it. Writing the name of the function will call a function. Functions are internally declared in a separate memory area. So a function can declare variables with the same as declared in the outer part of the program.

Type of function :- Build in function (all functions defined by python min() max() , lent() etc, User-defined functions (defined by the user)

Advantage of function :- (i) Reduces the size of the program (ii) improves reusability of code

def keyword:- def keyword declares a user defined function followed by parameters and terminated with a colon.

return keyword :- whenever the return keyword is executed inside a function it returns the control back to its caller along with some value if passed explicitly. Writing return is not compulsory and we can write as many return keywords as needed but only one return keyword is executed.

Actual parameters :- When we call a function and pass some values to the function. These passed values are called actual parameters.

Formal parameters :- The parameters declared in the header part of the function is called formal parameters or the values received by the functions from its caller is called formal parameters.

Default parameters:- It is formal parameters with the assignment of values. These values are used if the caller does not provide value to that parameter. **Remember default parameters are written after not default parameters.**

def << name of the >> (formal parameters) : function body is always writer in tab indentation

code here

code here

out of scope of function. The function call can be placed after this part.

Example :-

```
def myfunction(a,b,c=10) :  a,b and c is formal parameter and c is with default values
    print(a,b,c)
    return (a+b+c)
```

total = myfunction(10,20,30) # 10 12 and 30 are actual parameter

Q. Write a function findbig that take 2 integers as parameters and returns the largest value.

```
def findbig(a,b):
    if a>b:
```

```

        return a
    else:
        return b
x,y=5,10
bigvalue=myfunciton(x,y)
# Here bigvalue will store the values returned by the function
# x and y are actual parameters declared outside the function scope.
# a and b are called formal parameters that store the copy of x and y.

```

The same program can be written with default values

```

def findbig(a=100,b=50):
    if a>b:
        return a
    else:
        return b
x,y=5,10
bigvalue=myfunciton(x,y) # a and b will have 5 and 10 hence 10 will be
returned
print(bigvalue)
bigvalue=myfunction(y) # a and b will have 10 and 50 hence 50 will be
returned
print(bigvalue)
bigvalue=myfunction(x) # a nd b will have 5 and 50 hence 50 will be returned
print(bigvalue)
bigvalue=myfunction() # a and b will have 100 and 50 hence 100 will be
returned
print(bigvalue)

```

Practice question

- (i) `def fun2(name,age):`
`print(age,name)`
`func2(25,"Ramesh")` **Ans :- Ramesh, 25**
- (ii) `def fun3(a,b,c):`
`return a+1,b+2,c+3` **#if more than 1 values are returned than it will**
be as tuple
`t=fun3(10,20,30)`
`print(t)` **Ans:- (11,12,33)**
- (iii) `def fun2(list1):`
`for x in list1:`
`print(x.upper(),end="#")`
`fun2(['Rajesh','Kumar'])` **Ans:- RAJESH # KUMAR**
- (iv) `def fun2(num1,num2):`
`for x in range(num1,num2):`
`if x%4==0:`
`print(x,end=' ')`
`fun2(10,20)` **Ans:- 10 12 16 18**
- (v) `def prog(email):`
`for x in email.split("."):
 if x.isalpha():
 print("alphabet")
 elif x.isdigit():
 print("digit")`

```
        elif x.isupper():
            print("upper")
        else:
            print("all the best")
prog("rajesh.123.yahoo")
```

Ans :- Alphabet
 Digit
 Alphabet

```
(vi) def check(x,y):
      if x != y:
          return x+5
      else:
          return y+10
      print(check(10,5))   Ans :- 15
```

Python Text File Handling

TEXT FILE :- Python provides inbuilt functions for creating, writing, and reading files. There are two types of files that can be handled in python, normal text files. In text files, each line of text is terminated with a special character called EOL (End of Line), which is the new line character ('\n') in python by default. The string object of python is used for reading and writing the text file

Modes of the text file:-

Read(r):- Reading of existing file

overwrite(w):- creates a new file or overwrites the existing file

append(a):- Create a new file or add new content to the existing file

Read-Write(r+) :- read and overwrite only existing file

Write-read(w+) :- Create a new file or overwrite an existing file and reading is also possible

Append-read(a+):- Create a new file or add new content to an existing file and reading is also possible

File Object :- This is needed to keep a reference to a file in a python program whereas the file is actually stored in Hard Disk (Memory)

open() method:- It takes one or two parameters. First is name of the file and second mode of the file. If mode is not mentioned then the file is opened in read-only mode.

```
File_object=open(filename) # read only mode
```

```
File_object=open(filename,mode) # user's choice of mode
```

Example : - ABC.txt file is saved in the folder where python is installed

```
F=open("ABC.txt","r")
```

If ABC.txt file is saved in d drive and inside the computer folder then the command will be

```
F=open(d://computer//ABC.txt","r")
```

read() method :- It reads the entire content of the file and saves it into a string.

read(n) method :- It reads n bytes of a file from the position where the file pointer is located. When we

open a file the file pointer is placed at 0 positions. After reading n bytes the file pointer moves n bytes forward.

readlines():- It reads the entire content of the file and returns **list of strings**, every string is the lines of files.

readlines(n) :- It reads n lines from the position of file pointer and returns a **list of string**

write():- It writes string into a file

writelines(list of string) :- It writes multiple lines into file if all lines are written as a list of strings and all string should end with "\n" character.

PRACTICE PROGRAMM OF TEXT FILE HANDLING

Reading all the content of file

```
F=open("abc.txt","r")
```

```
S=F.read()
```

```
print(S)
```

```
F.close()
```

Reading file line by line

```
F=open("abc.txt","r")
```

```
L=F.readlines()
for x in L:
    print(x)
F.close()
if file contains following lines
    knowledge is
    power the computer
    is amplifier of power
The L will have ["knowledge is\n", "power the computer\n", "is amplifier of power"]
```

Counting lines in a file

Use print(len(L)) to count number of lines in above program

Counting lines start with the word "the"

Logic:- We need to split all the words of a every line and then check first word of each line.

```
F=open("abc.txt","r")
L=F.readlines()
count=0
for x in L: # read all the lines one by one
    L1=x.split() # It will split all the lines into words
    if L1[0].lower() == "the" :
        count=count+1
print("total lines are :- ",count)
F.close()
```

print line number that contains word "dog" anywhere

```
F=open("abc.txt","r")
S=F.readlines()
count=0
for x in S:
    count=count+1
    L=x.split()
    if "dog" in L:
        print(" the line number ", count, " has word dog")
F.close()
```

Count total number of vowels in a file "abc.txt"

Read the file character by character

```
F=open("abc.txt", "r")
S=f.read()
Count=0
for x in S:
    if x.lower() in "aeiou":
        count=count+1
print("total number of vowels are :- ", count)
F.close()
```

Count the occurrence of character "B", "D" separately. Only uppercases.

Read file character by character

```
F=open("abc.txt", "r")
```



```

S=F.read()
countB=0
countD=0
for x in S:
    if x=="D":
        countD=countD+1
    if x=="B":
        countB=countB+1
print(" Total occurance of B is ", countB)
print("Total occurance of D is ", countD)
F.close()

```

print all the lines of a file in reverse order.

If file contains following data

 This is line number 1

 This is line number 2

The output should be

 This is line number 2

 This is line number 1

```

F=open("abc.txt","r")
L=F.readlines()
for x in L[-1::-1]:
    print(x)
F.close()

```

Calculate total number of alphabets and digits in a file abc.txt.

```

F=open("abc.txt", "f")
S=F.read()
countalpha=0
countdigit=0
for x in S:
    if x.isalpha():
        countalpha=countalpha+1
    is x.isdigit():
        countdigit=countdigit+1
print("total number of alphabets and digits are ", countalpha, countdigit)
F.close()

```

Binary Files: It is a file that contains information in the same format as it is held in memory. In binary files, no delimiters are used for a line and no translations occur here. They represent the actual content such as image, audio, video, executable files, etc. These files are not human readable. The file extension of binary file is **.dat**.

- (i) Python object handles the binary files. Python provides a special module-**the pickle module** which has different predefined functions to manipulate the binary files.
- (ii) Using dump() method : It is used to write objects in a file. Before use the dump() method, you first have to import the pickle module.

Syntax: import pickle

..... ..

```
pickle.dump(object_to_pickle,FileObject)
```

(iii) Using load() method :This method is used to read data from a binary file.

Syntax: import pickle

..... ..

```
object=pickle.load(FileObject)
```

* In binary file data is in unreadable format. To work on a binary file, we have to convert the data into readable form for read as well as write operation.

* The binary file stores some objects which have some structure associated with them. Like list, nested list, tuple, dictionary etc..

* These objects are first serialized and then stored in a binary file.

* If a binary file (existing) open for reading purpose, when the last record is reached (EOF reached), it may raise an EOF Error exception, if not handled properly.

* Thus a binary file should open for reading purposes either in “try and except” blocks or using “with statement”.

Serialization or Pickling:

It is the process of transforming a python object to a stream of bytes called byte streams. These byte streams can then be stored in binary files. Serialization process is also called pickling.

De-serialization or un-pickling:

It is the reverse of the pickling process where a byte stream is converted back to a Python object.

The pickle module implements the algorithm for serializing and de-serialization the python objects and deals with binary files. The Pickle Module must be imported to read and write objects in binary files.

MODES OF BINARY FILES

b = Open the binary file

rb = Open binary file in read only mode (file must be existed)

wb = Open binary file in write only mode (new file created, overwritten if existed)

ab = Open binary file in append (write only) mode. (Open if exists otherwise create new file)

rb+ = Open binary file in read & write mode. (file must be existed)

wb+ = Open binary file in write & read mode. (new file created, overwritten if existed)

ab+ = Open binary file in append (write & read) mode. (Open if exists otherwise create new file)

BASIC OPERATIONS ON BINARY FILE

- Creating a new file
- Reading from file
- Writing into file
- Appending the file
- Searching in File
- Deleting data from file
- Creating a copy of file

OPENING AND CLOSING A BINARY FILE

open() function:

Syntax:

```
File_Object=open(file_name, access mode)
```

Example:

```
file_obj= open("bin_file.dat",'wb')
```

This statement opens bin_file.dat binary file in write mode.

Note : if file mode is not mentioned in open function then default file mode i.e 'rb' is used,

close() function:

The close() method of a file object flushes any unwritten information and close the file object after which no more writing can be done. Example: `file_obj.close()`

WRITING DATA INTO A BINARY FILE

To write an object into file, the file should be opened in write mode. The dump() function of the pickle module is used to write objects into a binary file.

Syntax:

```
import pickle
```

```
File_Handler=open("Bin_file.dat",'wb')
```

```
pickle.dump(python_Obj_to_be_Written, File_obj)
```

Example:

```
# To Write a Dictionary Object in Binary file.
```

```
import pickle
```

```
stud={}
```

```
fwb=open("student.dat","wb")
```

```
choice='y'
```

```
while choice.lower()=='y':
```

```
    rno=int(input("Enter Roll No: "))
```

```
    name=input("Enter Name: ")
```

```
    marks=float(input("Marks out of 500 "))
```

```
    per=marks/5
```

```
    if (per>=33):
```

```
        res="Pass"
```

```
    else:
```

```
        res="Fail"
```

```
    stud['rollno']=rno
```

```
    stud['name']=name
```

```
    stud['Marks']=marks
```

```
    stud['percent']=per
```

```
    stud['result']=res
```

```
    pickle.dump(stud, fwb)
```

```
    print("Record Saved in File")
```

```
    choice=input("More Record(Y/N)? ")
```

```
fwb.close()
```

APPENDING DATA IN BINARY FILE

Binary file must be opened in append mode (i.e., "ab") to append the records in file. A file opened in append mode will retain the previous records and write the new records at the end.

Syntax:

```
import pickle
File_Handler=open("Bin_file.dat",'ab')
pickle.dump(python_Object_to_be_Written, File_Handler)
```

Example:

```
# To Append data in the Binary file
import pickle
stud={}
fwb=open("student.dat","ab")
choice='y'
while choice.lower()=='y':
    rno=int(input("Enter Roll No: "))
    name=input("Enter Name: ")
    marks=float(input("Marks(out of 500): "))
    per=marks/5
    if(per>=33):
        res="Pass"
    else:
        res="Fail"
    stud['rollno']=rno
    stud['name']=name
    stud['Marks']=marks
    stud['percent']=per
    stud['result']=res
    pickle.dump(stud, fwb)
    print("Record Saved in File")
    choice=input("More Record(Y/N)? ")
fwb.close()
```

READING DATA FROM A BINARY FILE:

While working with a binary file for reading purposes the runtime exception EOFError raised when it encountered the EOF position. This EOFError exception can be handled with two ways.

1. Use of try and except block

The try and except statements together, can handle runtime exceptions. In the try block, i.e., between the try and except keywords, write the code that can generate an exception and in the except block, ie., below the except keyword, write what to do when the exception (EOF - end of file) has occurred

Syntax:

```
File_object=("binary File Name",'access mode')
try:
```

.....

Write actual code, work in binary file

.....
except EOFError:

.....
Write Code here that can handle the error raised in try block.
.....

2. Use of 'with' statement

The 'with' statement is a compact statement which combines the opening of file, processing of file along with inbuilt exception handling and also closes the file automatically after with block is over.

Explicitly, we need not to mention any exception for the "with statement".

Syntax:

with open("File_Name",'mode') as File_Handler:

```
# Read Records from Binary file
import pickle
stud={}
frb=open("student.dat","rb")
try:
    while True:
        stud=pickle.load(frb)
        print(stud)
except EOFError:
    frb.close()
```

SEARCHING DATA FROM A BINARY FILE

```
import pickle
stud={}
found=0
print("Searching in file student.dat...")
try:
    frb=open("student.dat", "rb")
    while True:
        stud=pickle.load(frb)
        if stud['percent']>51.0:
            print(stud)
            found+=1
except EOFError:
    if found==0:
        print("No Record with marks>51")
    else:
        print(found," Record(s) found")
    frb.close()
```

COPYING A BINARY FILE DATA TO ANOTHER BINARY FILE

```
import pickle
def fileCopy():
    ifile = open("student.dat","rb") # Existing File
```

```

ofile = open("newfile.dat","wb") # New File
try:
while True:
    rec=pickle.load(ifile)
    pickle.dump(rec,ofile)
except EOFError:
ifile.close()
ofile.close()
print("Copied successfully")
def display1():
ifile = open("student.dat","rb")
print("----Records of Student file---")
try:
while True:
    rec=pickle.load(ifile)
    print(rec)
except EOFError:
ifile.close()
def display2():
ofile = open("newfile.dat","rb")
print("----Records of Copy file---")
try:
while True:
    rec=pickle.load(ofile)
    print(rec)
except EOFError:
ofile.close()
fileCopy()
display1()
display2()

```

flush() Method: This method will force out any unsaved data that exists in a program buffer to the actual file. Python automatically flushes the files when closing them. But you may want to flush the data before closing any file.

Syntax: FileObject.flush()

RANDOM ACCESS & UPDATING BINARY FILE

Python provides two functions that help to manipulate the position of the file pointer and we can read and write from the desired position in the file. The Two functions of Python are: tell() and seek()

(i) The tell() Method:

tell() method can be used to get the current position of File pointer in the file. This method takes no parameters and returns an integer value. Initially the file pointer points to the beginning of the file(if not opened in append mode).

Syntax

```
fileObject.tell()
```

This method returns the current position of the file read/write pointer within the file.

(ii) The seek() Method:

In Python, seek() function is used to change the position of the File pointer to a given specific position in the file.

Syntax

```
fileObject.seek(offset [, mode])
```

where

offset is a number-of-bytes

mode is a number out of 0 or 1 or 2

0: sets the reference point at the beginning of the file.

1: sets the reference point at the current file position.

2: sets the reference point at the end of the file.

Example:

```
f=open("chapter.dat','rb')
```

```
f.seek(20)
```

will place the file pointer at 20th byte from the beginning of the file (default)

```
f.seek(20,1) # will place the file pointer at 20 bytes ahead of current file-pointer position  
(mode = 1)
```

```
f.seek(-20,2)
```

will place file pointer at 20 bytes behind (backward direction) from end-of file (mode = 2)

```
f.seek(-10,1) # will place file pointer at 10 bytes behind from current file-pointer position  
(mode = 1)
```

Note:

· Backward movement of file-pointer is not possible from the beginning of the file (BOF).

· Forward movement of file-pointer is not possible from the end of file (EOF).

Program of tell() and seek() functions

```
import pickle
```

```
stu={ }
```

```
found =False
```

```
# open binary file in read and write mode
```

```
rfile=open("student.dat", "rb+")
```

```
# Read from the file
```

```
try:
```

```
    while True:
```

```
        pos=rfile.tell()
```

```
        stu=pickle.load(rfile)
```

```
        if stu["marks"] == 81:
```

```
            stu["Marks"] +=2
```

```
            rfile.seek(pos,0)
```

```
            pickle.dump(stu, rfile)
```

```
            found=True
```

```
except EOFError:
```

```
    if found==False:
```

```
        print("Sorry, No Record found")
```

```
else:
    Print("Record(s) updated")
rfile.close()
```

CSV File: CSV (Comma Separated Values) format is one of the most simple and common ways to store data in tabular form. Each record consists of one or more fields separated by commas. To represent a CSV file, it must be saved with the .csv file extension. It is a file format for data storage which looks like a text file. The information is organized with one record in each line and each field is separated by comma.

- It is a plain text file that contains the comma-separated data.
- These files are often used for exchanging data between different applications.
- CSV files are usually created by programs that handle huge amounts of data. They are used to export data from spreadsheets (ex:- excel file) and databases (Ex:- Oracle, MySQL). It can be used to import data into a spreadsheet or a database.

(i) **Working with csv file:** csv files are used to store a large number of variables or data. They are incredibly simplified spreadsheets. Each line in a csv file is a data record.

(ii) **Read from CSV File: Using csv.reader():** To read data from csv files, you must use the reader() function to generate a reader object. This function returns a reader object which is an iterator of lines in the csv file.

Syntax: csv.reader()

(iii) **csv.writer ():** The csv.writer(file object) function returns a writer object that converts the user's data into delimiter string.

(iv) **Write into a CSV File using csv.writerow():** To write an existing file, you must first open the file in one of writing modes (w, a or r+) first. then writerow() function is used to write items in a sequence (list, tuple or string) separating them by comma.

(v) **Writerows():** If we need to write the content of 2-Dimensional list into csv file, instead of using writerow() function many times, we can write use object.writerows() method.

Syntax for accessing modules: import module_name

Syntax for accessing methods: Objectname=module name.method_name()

TEXT FILE SOLUTION STEPS

Def of fun->Open file->Use method as per Question->Loop->Condition->Print->Close File

BINARY FILE SOLUTION STEPS

Pickle Module->Def of function->Open file-> Inputs->Store Object->dump ->Close File

CSV File Characteristics:

- One line for each record
- Comma separated fields
- Space-characters adjacent to commas are ignored
- Fields with in-built commas are separated by double quote characters.

When Use CSV:

- When data has a strict tabular structure
- To transfer large database between programs
- To import and export data to office applications.
- To store, manage and modify shopping cart catalogue

Why Use CSV Files? / Advantages of CSV Files:

- CSV is faster to handle.
- CSV is easy to generate.
- CSV is human readable and easy to edit manually.
- CSV is simple to implement and parse.
- CSV is processed by almost all existing applications.

CSV Files Disadvantages:

- No standard way to represent binary data.
- There is no distinction between text and numeric values.
- Poor support of special characters and control characters.
- CSV allows to move most basic data only. Complex configurations cannot be imported and exported this way.
- Problems with importing CSV into SQL (no distinction between NULL and quotes)

CSV File Structure:

sample.csv file structure

Name,	DOB,	City
Ram,	12-Jul-2001,	Delhi
Mohan,	23-Jan-2005,	Delhi
Suraj,	17-Dec-2002,	Kolkata

Python CSV Module:

- CSV Module is available in Python Standard Library.
- The CSV module contains classes that are used to read and write tabular form of data into CSV format.
- To work with CSV Files, programmer have to import CSV Module.

e.g. `import csv`

Methods of CSV Module: **writer()** and **reader()**

Both the methods return an Object of writer or reader class. Writer Object again have two methods – `writerow()` & `writerows()`.

writer() Methods:

This function returns a writer object which is used for converting the data given by the user into delimited strings on the file object.

writer() Object Methods –

- `w_obj.writerow(<Sequence>)` #Write a Single Line
- `w_obj.writerows (<Nested Sequence>)` #Write Multiple Lines

Example:-

writerow()

```
import csv
row=['Nikhil', 'CEO', '2', '9.0']
f=open("myfile.csv", 'w')
w_obj = csv.writer(f)
w_obj.writerow(row)
f.close()
```

writerows()

```
import csv
```

```
rows = [['Nikhil','CEO','2','9.0'],
        ['Sanchit','CEO','2','9.1']]
f=open("myfile.csv",'w')
w_obj = csv.writer(f)
w_obj.writerows(rows)
f.close()
```

reader() Methods:

This function returns a reader object which will be used to iterate over lines of a given CSV file.

```
r_obj = csv.reader( csvfile_obj )
```

To access each row, we have to iterate over this object.

```
for i in r_obj:
    print(i)
```

Example:-

```
import csv
f=open("myfile.csv",'r')
r_obj = csv.reader(f)
for data in r_obj:
    print(data)
f.close()
```

If we consider the *sample.csv* file given above in the *CSV file structure* the output of the above code will be:

```
## OUTPUT:
['Name', 'DOB', 'City']
['Ram', '12-Jul-2001', 'Delhi']
['Mohan', '23-Jan-2005', 'Delhi']
['Suraj', '17-Dec-2002', 'Kolkata']
```

DATA STRUCTURE - STACK

Data Structure: A data structure is a group of data which can be processed as a single unit. This group of data may be of similar or dissimilar data types. Data Structures are very useful while programming because they allow processing of the entire group of data as a single Unit.

Types of data structures:

Linear data structures: The elements are stored in a sequential order.

Example: Array, Stack, Queue.

Non-Linear data structures: The elements are not stored in sequential order.

Example: Graph, Tree, linked lists.

Stack: It is a data structure that allows adding and removing elements in a particular order. Every time an element is added, it goes on the top of the stack; the only element that can be removed is the element that was at the top of the stack.

Two Characteristics of Stacks: It is a LIFO (Last-In First-Out) data structure, The insertion and deletion happens at one end i.e. from the top of the stack.

Operations possible in the data structure: Major operations are Traversal, Insertion, Deletion and Searching.

Major operations on Stack:

1. **PUSH:** The addition of elements is known as PUSH operation. It is done using the TOP position.
2. **POP:** Removal of elements is known as POP operation. Removal of object is always done from TOP position.
3. **PEEK:** To show/ display the element placed at TOP position in the stack.

Few applications of stack:

1. Expression evaluation
2. Backtracking (game playing, finding paths, exhaustive searching).
3. Memory management, run-time environment for nested language features.

Stack implementation using List:

1. PUSH: The addition of elements is known as PUSH operation. It is done on the TOP position.

```
S= ['element1', 'element2', 'element3', 'element4']
```

```
S.append('newElement') # pushing element in stack at the TOP
```

```
S= ['element1', 'element2', 'element3', 'element4', 'newElement'] #List after insertion
```

2. POP: Removal of elements is known as POP operation. It is also done using the TOP position.

```
S= ['element1', 'element2', 'element3', 'element4', 'newElement']
```

```
S.pop() # removes element at top
```

```
S= ['element1', 'element2', 'element3', 'element4'] #List after deletion
```

3. PEEK: To show/ display the element placed at TOP position in the stack.

```
return S[-1] # shows element at top but do not remove it from the stack
```

Program using list for explaining all operations of stack:

```
#-----
maxsize=5
top=-1
#-----
def pop(stack):
    global top
    if (isEmpty(stack)):
        print("\n Stack is Underflow \n")
    else:
        n=stack[top]
        stack.pop()
        print("Removed Element ",n)
        top=top-1
def push(stack):
    global top
    if (isFull(stack)):
        print("\n Stack is Overflow \n ")
    else:
```

```

n=int(input("\n Enter an element to push :"))
top=top+1
stack.append(n)

def traverse(stack):
    if (isEmpty(stack)):
        print("Stack is Empty ")
    else:
        for i in stack:
            print(i, end=" ")

def peak(stack):
    global top
    return stack[top]

def isFull(stack):
    global maxsize
    if (top==maxsize-1):
        return True
    else:
        return False

def isEmpty(stack):
    if (top==-1):
        return True
    else:
        return False

```

```

#***** Main Program *****

```

```

stack=[ ]
a=True
while a:
    print("\n1. Stack Push Operation ")
    print("2. Stack Pop Operation ")
    print("3. Show Peak / Top Position ")
    print("4. Traverse / Show Stack ")
    print("5. Exit ")
    ch=int(input("Enter Choice :"))
    if ch == 1:
        push(stack)

```

```

elif ch == 2:
    pop(stack)
elif ch == 3:
    print("\n Peak Position ",peak(stack))
    print('Top is ', top)
elif ch == 4:
    traverse(stack)
elif ch == 5:
    a=False
else:
    print('Please enter a valid choice ')

```

01 mark Questions:

- Q1. What is the full form of csv? Which delimiter used by default?
Ans: CSV- Comma Separated Value .Comma delimiter is used by default.
- Q2. What is the difference between read('r') and write('w') mode of file?
Ans: Read mode: - Opens a file for reading, error if the file does not exist. Write mode: Opens a file for writing, creates the file if it does not exist.
- Q3. Which modules used in csv and binary file?
Ans: In csv file- csv module and binary file: pickle module.
- Q4. Which method is used to specify current position and particular position of file object respectively?
Ans: tell ()-specify current position of file object and seek ()- specify the particular position of file object.
- Q5. Give the names of major operations used in Stack?
Ans: push(), pop() and peek()
- Q6. Which mechanism is used by Stack?
Ans: LIFO (Last-In First-Out)
- Q7. Which of the following statements correctly explain the function of seek() method?
 (a) Tells the current position within the file.
 (b) Determines if you can move the file position or not.
 (c) Indicates that the next read or write occurs from that position in a file.
 (d) Moves the current file position to a given specified position
Ans: (d) Moves the current file position to a given specified position
Note: seek() method moves the current file position to a given specified position.
 This method does not return any value.
- Q8. Which is faster, binary or text file?
Ans: Binary files are faster than Text files because a binary image of the record is stored directly from memory to disk (and vice versa).
- Q9. Differentiate between Text Files and Binary Files.

Ans: A text file consists of human readable characters, which can be opened by any Text editor. while, binary files are made up of non-human readable characters and symbols, which require specific programs to access its contents.

Q10. Differentiate between Data Type and Data Structure.

Ans: A data type defines a set of values along with well-defined operations string its input-output behavior. For example, we cannot put decimal point in an integer or two strings can't be multiplied etc.

While, a data structure is a physical implementation that clearly defines way of storing, accessing, manipulating data stored in a data structure. The data stored in a data structure has a specific data type. For example, in a stack- all insertions and deletions take place at one end only.

Q.11. Which of the following statement opens a binary file 'test.bin' in write mode and writes data from a tuple t1=(2, 5, 8, 2) on the binary file?

(a) with open('test.bin','wb') as f:

pickle.dump(f, t1)

(b) with open('test.bin','wb') as f:

pickle.dump(t1,f)

(c) with open('test.bin','wb+') as f:

pickle.dump(f,t1)

(d) with open('test.bin','ab') as f:

pickle.dump(f,t1)

Ans: (b) with open('test.bin','wb') as f:

pickle.dump(t1,f)

03 marks questions:

Q1. ICC has created a dictionary containing top players and their runs as key value pairs of cricket team. Write a program, with separate user defined functions to perform the following operations:

- Push the keys (name of the players) of the dictionary into a stack, where the corresponding value (runs) is greater than 59.
- Pop and display the content of the stack.

For example:

If the sample content of the dictionary is as follows:

SCORE={"Mukesh":43, "Virendra":64, "Rajesh":88, "Amit":75, "Wajid":97 }

The output from the program should be:

Virendra Rajesh Amit Wajid

Ans:

```
SCORE={"Mukesh":43, "Virendra":64, "Rajesh":88, "Amit":75, "Wajid":97 }
```

```
def PUSH(S,R):
```

```
    S.append(R)
```

```
def POP(S):
```

```
    if S!=[]:
```

```
        return S.pop()
```

```
    else:
```

```
        return None #Message
```

```
ST=[]
```

```
for k in SCORE:
```

```
    if SCORE[k]>59:
```

```
        PUSH(ST,k)
```

```
while True:
```

```
    if ST!=[]:
```

```
        print(POP(ST),end=" ")
```

```
else:
    break
```

Q2. Madhuri has a list containing 10 integers. You need to help him create a program with separate user defined functions to perform the following operations based on this list.

- Traverse the content of the list and push the ODD numbers into a stack.
- Pop and display the content of the stack.

For Example:

If the sample Content of the list is as follows:

```
N=[12, 13, 34, 56, 21, 79, 98, 22, 35, 38]
```

Sample Output of the code should be:

```
13,21,89,35
```

Ans:

```
N=[12, 13, 34, 56, 21, 79, 98, 22,35, 38]
```

```
def PUSH(S,N):
```

```
    S.append(N)
```

```
def POP(S):
```

```
    if S!=[]:
```

```
        return S.pop()
```

```
    else:
```

```
        return None
```

```
ST=[]
```

```
for k in N:
```

```
    if k%2!=0:
```

```
        PUSH(ST,k)
```

```
while True:
```

```
    if ST!=[]:
```

```
        print(POP(ST),end=" ")
```

```
    else:
```

```
        break
```

Q3. Mayur Enterprises have a dictionary of top performer EMPLOYEES and their SALES of as key value pairs of COMPANY. Write a program, with separate user defined functions to perform the following operations:

- Push the keys (name of the EMPLOYEE) of the dictionary into a stack, where the corresponding value (SALES) is greater than 500000.
- Pop and display the content of the stack.

For example:

If the sample content of the dictionary is as follows:

```
SALES={"SUNIL":700000, "ROHIT":400000, "RAJEEV":350000, "MAYANK":750000, "RAHUL":1000000, }
```

The output from the program should be: SUNIL MAYANK RAHUL

Solution:

```
SALES={"SUNIL":700000, "ROHIT":400000, "RAJEEV":350000, "MAYANK":750000, "RAHUL":1000000, }
```

```
def PUSH(STK,S):
```

```
    STK.append(S)
```

```
def POP(STK):
```

```
    if STK!=[]:
```

```
        return STK.pop()
```

```

else:
    return None
ST=[]
for k in SALES:
    if SALES[k]>500000:
        PUSH(ST,k)
while True:
    if ST!=[]:
        print(POP(ST),end=" ")
    else:
        break

```

Q4. Saroj have a list of 10 numbers . You need to help him create a program with separate user defined functions to perform the following operations based on this list.

- Traverse the content of the list and push the numbers into a stack which are divisible by 5.
- Pop and display the content of the stack.

For Example:

If the sample Content of the list is as follows:

N=[2,5,10,13,20,23,45,56,60,78]

Sample Output of the code should be:

5,10,20,45,60

Solution:

N= [2,5,10,13,20,23,45,56,60,78]

```
def PUSH(S,N):
```

```
    S.append(N)
```

```
def POP(S):
```

```
    if S!=[]:
```

```
        return S.pop()
```

```
    else:
```

```
        return None
```

```
ST=[]
```

```
for k in N:
```

```
    if k%5==0:
```

```
        PUSH(ST,k)
```

```
while True:
```

```
    if ST!=[]:
```

```
        print(POP(ST),end=" ")
```

```
    else:
```

```
        break
```

04 Marks Questions:

Q1. 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:

(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 of Amritya.

```
import pickle
def AddStudents():
    _____ #1 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]
        _____ #2 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: _____ #3 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()
```

Answer the questions from the above mentioned program:

(i) Which of the following commands is used to open the file "STUDENT.DAT" for writing only in binary format? (marked as #1 in the Python code)

- (a) F= open("STUDENT.DAT",'wb') (b) F= open("STUDENT.DAT",'w')
 (c) F= open("STUDENT.DAT",'wb+') (d) F= open("STUDENT.DAT",'w+')

Ans: (a) F= open("STUDENT.DAT",'wb') #To open the file binary, open() function is used.

(ii) Which of the following commands is used to write the list L into the binary file 'STUDENT.DAT'? (marked as #2 in the Python code)

- (a) pickle.write(L,f) (b) pickle.write(f, L) (c) pickle.dump(L,F) (d) f=pickle.dump(L)

Ans: (c) pickle.dump(L,F) #To write the list L into file, pickle.dump (L,F) is used.

#For using dump() method, you first have to import the pickle module.

(iii) Which of the following commands is used to read each record from the binary file 'STUDENT.DAT'? (marked as #3 in the Python code)

(a) R = pickle.load(F) (b) pickle.read(r,f) (c) r= pickle.read(f) (d) pickle.load(r,f)

Ans: (a) R = pickle.load(F) #The correct statement used in marked as #3 is R=pickle.load(F) #because load() method is used to load data from a binary file.

(iv) Which of the following statement(s) are correct regarding the file access modes?

(a) 'r+' opens a file for both reading and writing. File object points to its beginning.

(b) 'w+' opens a file for both writing and reading. Adds at the end of the existing file, if it exists and creates a new one, if it does not exist.

(c) 'wb' opens a file for reading and writing in binary format. Overwrites the file, if it exists and creates a new one, if it does not exist.

(d) 'a' opens a file for appending. The file pointer is at the start of the file, if the file exists.

Ans: (a) 'r+' opens a file for both reading and writing. File object points to its beginning. #The correct statement regarding file access modes is r+ opens a file for both #reading and writing. File object points to its beginning.

Q2. Consider a binary file stock.dat that has the following data: OrderId, MedicineName, Qty and Price of all the medicines of wellness medicos, write the following functions:

a)AddOrder() that can input all the medicine orders.

b)DisplayPrice() to display the details of all the medicine that have Price more than 10.

Ans:(a)

```
import pickle
```

```
def AddOrder():
```

```
    f=open("Stock.dat",'ab')
```

```
    OrderId=input("Enter Order Id")
```

```
    MedicineName=input("Enter Medicine Name")
```

```
    Qty=int(input("Enter Quantity:"))
```

```
    Price=int(input("Enter Price:"))
```

```
    data=[OrderId,MedicineName,Qty,Price]
```

```
    pickle.dump(data,f)
```

```
    f.close()
```

```
AddOrder()
```

(b)

```
def DisplayPrice():
```

```
    f=open("Stock.dat",'rb')
```

```
    try:
```

```
        while True:
```

```
            data=pickle.load(f)
```

```
            if data[3]>10:
```

```
                print(data[0],data[1],data[2],data[3],sep="\t")
```

```
    except:
```

```
f.close()
```

```
DisplayPrice()
```

Q3. Create a binary file funandfood.dat (a) Write a function AddRides() that can store details of rides such as Ticketno, Ridename, No_ofpersons, and price with the help of (b) Write python function displayTotal to display total amount of each ticket. Also count total number of tickets sold.

Ans: (a)

```
import pickle # to use binary file
```

```
def AddRides():
```

```
    f=open("funandfood.dat",'ab')
```

```
    Ticketno=input("Enter Ticket Number")
```

```
    RideName=input("Enter The Name of Ride")
```

```
    No_ofperson=int(input("Enter no of Persons"))
```

```
    Price=int(input("Enter Price:"))
```

```
    data=[Ticketno,RideName,No_ofperson,Price]
```

```
    pickle.dump(data,f)
```

```
    f.close()
```

```
AddRides()
```

(b)

```
def DisplayTotal():
```

```
    f=open("funandfood.dat",'rb')
```

```
    total=0
```

```
    count=0
```

```
    try:
```

```
        while True:
```

```
            data=pickle.load(f)
```

```
            total=data[2]*data[3]
```

```
            print(data[0],data[1],data[2],data[3],total,sep="\t")
```

```
            count=count+1
```

```
    except:
```

```
        f.close()
```

```
        print("Total number of Tickets sold are:",count)
```

```
DisplayTotal()
```

Q4. A binary file "Book.dat" has structure [BookNo, Book_Name, Author, Price].

(a) Write a user defined function CreateFile() to input data for a record and add to Book.dat.

(b) Write a function CountRec(Author) in Python which accepts the Author name as parameter and return number of books by the given Author are stored in the binary file "Book.dat".

Ans: (a)

```
import pickle
```

```

def CreateFile():
    fobj=open("Book.dat","ab")
    BookNo=int(input("Book Number : "))
    Book_name=input("Name :")
    Author = input("Author: ")
    Price = int(input("Price : "))
    rec=[BookNo,Book_name,Author,Price]
    pickle.dump(rec,fobj)
    fobj.close()
CreateFile()

```

(b)

```

def CountRec(Author):
    fobj=open("Book.dat","rb")
    num = 0
    try:
        while True:
            rec=pickle.load(fobj)
            if Author==rec[2]:
                num = num + 1
    except:
        fobj.close()
    return num
name=input("Enter author name :")
print(CountRec(name))

```

Q5. A binary file named "TEST.dat" has some records of the structure [Subject, ScoredMarks].

(a) Write a function in Python named AddRec() to add following records in the file "TEST.dat".

```

["maths", 96]
["cs",95]
["maths",90]
["cs",80]

```

(b) Write a function in Python named DisplayAvgMarks(Sub) that will accept a subject as an argument and read the contents of TEST.dat. The function will calculate & display the Average of the ScoredMarks of the passed Subject on screen.

Ans: (a)

```

import pickle
def AddRec():
    f=open("TEST.dat","wb")
    pickle.dump(["maths",96],f)
    pickle.dump(["cs",95],f)
    pickle.dump(["maths",90],f)
    pickle.dump(["cs",80],f)
    f.close()
AddRec()

```

(b)

```

def DisplayAvgMarks(sub):
    f=open("TEST.dat","rb")
    count=0
    sum=0

```

```

try:
    while True:
        #pos=f.tell()
        rec=pickle.load(f)
        if rec[0]==sub:
            sum+=rec[1]
            count+=1
    except:
        f.close()
    print("AVG Marks:",sum/count)
sub=input("Enter subject :")
DisplayAvgMarks(sub)

```

Q6. Arun, during Practical Examination of Computer Science, has been assigned an incomplete search() function to search in a pickled file student.dat. The file student.dat is created by his teacher and the following information is known about the file.

- File contains details of students in [roll_no,name,marks] format.
- File contains details of 10 students (i.e. from roll_no 1 to 10) and separate list of each student is written in the binary file using dump().

Arun has been assigned the task to complete the code and print details of roll number 1.

```

def search():
    f = open("student.dat",___) #Statement 1
    ___: #Statement 2
    while True:
        rec = pickle.___ #Statement 3
        if(___): #Statement 4
            print(rec)
    except:
        pass
    f.close()

```

Answer the questions from the above mentioned program:

(i) In which mode, Arun should open the file in Statement 1?

- (a) r (b) r+ (c) rb (d) wb

Ans: (c) rb # This mode opens a file for reading only in binary format

(ii) Identify the suitable code to be used at blank space in line marked as Statement 2.

- (a) if(rec[0]==1) (b) for i in range(10) (c) try (d) pass

Ans: (c) try

(iii) Identify the function (with argument), to be used at blank space in line marked as Statement 3.

- (a) load() (b) load(student.dat) (c) load(f) (d) load(fin)

Ans: (c) load(f) #This method is used to load data from a binary file.

(iv) What will be the suitable code for blank space in line marked as Statement 4.

- (a) rec[0]==2 (b) rec[1]==2 (c) rec[2]==2 (d) rec[0]==1

Ans: (d) rec[0]==1

05 Marks Questions:

Q1. Mohit, 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

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("Class : ")
    section = input("Enter Section : ")
    rec = [____] #Statement 4
    data.append(rec)
stuwriter. ____ (data) #Statement 5
fh.close()
```

Answer the questions from the above mentioned program:

(i) Identify the suitable code for blank space in line marked as Statement 1.

- (a) csv file (b) CSV (c) csv (d) Csv

Ans: (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"

Ans: (b) "Student.csv", "w"

It opens a file student.csv in write mode because append() method is using.

(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)

Ans: (c) writer(fh) #csv. writer is used to insert data to the CSV file.

(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,section

Ans: (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()

Ans: (c) writerows()

#writerows() writes each sequence in a list as a comma separated line of items in file.

Q2. Abhishek is making a software on “Countries & their Capitals” in which various records are to be stored/retrieved in CAPITAL.CSV data file. It consists of some records. He has written the following code. As a programmer, you have to help him to successfully execute the program.

- (a) Write a function in Python named AddNewRec(Country,Capital) to append following records in the file “CAPITAL.CSV”.

```
["FRANCE","PARIS"]  
["SRILANKA","COLOMBO"]
```

- (b) Write a function in Python named ShowRec() that will show all the contents of CAPITAL.CSV.

Ans: (a)

```
import csv  
def AddNewRec(Country,Capital):  
    f=open("CAPITAL.CSV",'a')  
    fwriter=csv.writer(f,lineterminator="\n")  
    fwriter.writerow([Country,Capital])  
    f.close()
```

(b)

```
def ShowRec():  
    with open("CAPITAL.CSV","r") as NF:  
        NewReader=csv.reader(NF)  
        for rec in NewReader:  
            print(rec[0],rec[1])
```

```
AddNewRec("FRANCE","PARIS")  
AddNewRec("SRILANKA","COLOMBO")
```

```
ShowRec()
```

Q3. 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'.

Ans:(a)

```
import csv
```

```
def CSVOpen():
    with open('books.csv','a',newline='') as csvf:
        cw=csv. writer (csvf)
        cw. writerow ([ 'Title', 'Author', 'Price'])
        cw.writerow(['Rapunzel','Jack',300])
        cw.writerow(['Rarbie','Doll',900])
        cw.writerow(['Johnny','Jane',280])
```

(b)

```
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')
```

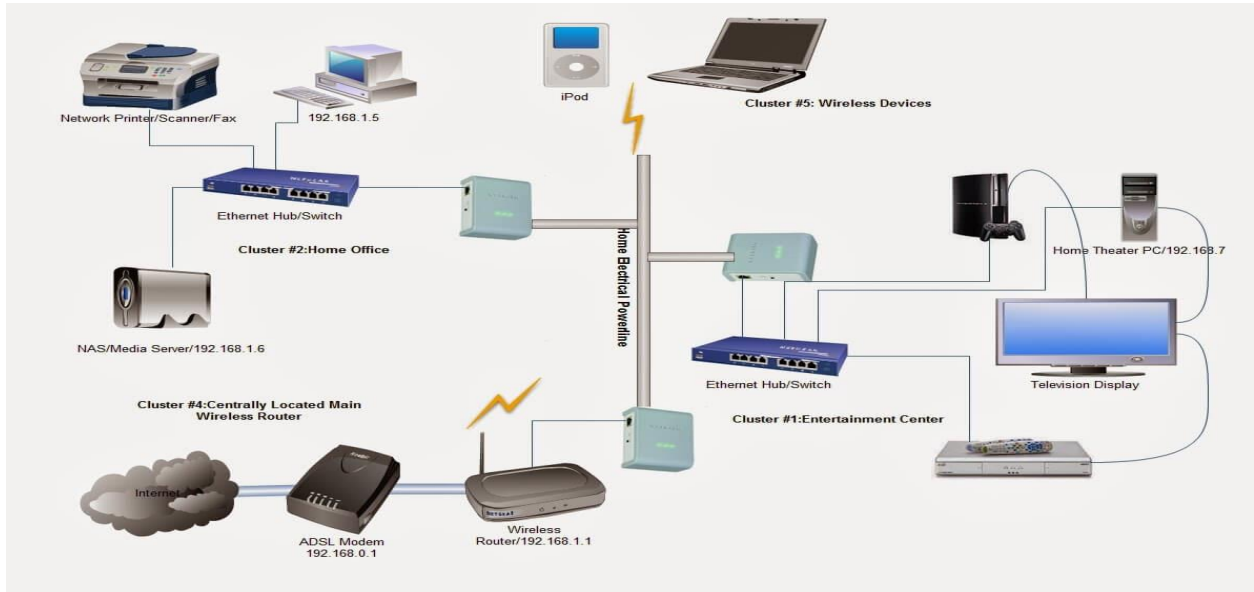
CSVOpen()

CSVRead()

Unit : 3 introduction to Computer Networks

Network:-

The collection of interconnected computing devices is called a network. Two computing devices are said to be interconnected if they are capable of sharing and exchanging information.



Benefits of Network: -

- (1) Resource Sharing:** Resource Sharing means to make the applications/programs, data(files) and peripherals available to anyone on the network irrespective of the physical location of the resources and the user.
- (2) Reliability:** Reliability means to keep the copy of a file on two or more different machines, so if one of them is unavailable (due to some hardware crash or any other) then its other copy can be used.
- (3) Cost Factor:** Cost factor means it greatly reduces the cost since the resources can be shared. For example a Printer or a Scanner can be shared among many computers in an office/Lab.
- (4) Communication Medium:** Communication Medium means one can send and receive messages. Whatever the changes at one end are done, can be immediately noticed at another.

EVOLUTION OF NETWORKING

ARPANET (1969) - US Government formed an agency named ARPANET(Advanced Research Project Agency Network) to connect computers at various universities and defence agencies to share data/information efficiently among all of them.

NSFNET (1985) - National Science Foundation Network was a program of coordinated, evolving projects sponsored by the National Science Foundation (NSF) from 1985 to 1995 to promote advanced research and education networking in the United States. The program created several nationwide backbone computer networks in support of these initiatives. Initially created to link researchers to the NSF-funded supercomputing centers, through further public funding and private industry partnerships it developed into a major part of the Internet backbone.

INTERNET (1990)- INTER-connection NETwork , The worldwide network of networks.

Data communication terminologies:

Concept of communication: Communication is the act of sending and receiving data from one device to another device or vice-versa. Data can be of any form i.e. text, image, audio, video and multimedia files.

Components of Data communication:

Sender: A device that can send data over a network i.e. computer, laptop, smart phone etc.

Receiver: A device can receive data over a network i.e. computer, laptop, smart phone etc.

The sender and receivers are basically called **nodes**.

Message: It is the data/information that needs to be shared between the sender and receiver.

Communication media: It is the medium through which the data/information is travelled between the sender and receiver. These may be wired or wireless.

Protocols: A network protocol is an established set of rules that determine how data is transmitted between different devices in the same network. Essentially, it allows connected devices to communicate with each other, regardless of any differences in their internal processes, structure or design.

Measuring Capacity of Communication Media: In data communication, the transmission medium is also known as channel. The capacity of a channel is the maximum amount of signals or traffic that a channel can carry. It is measured in terms of bandwidth and data transfer rate as described below:

Bandwidth

Bandwidth of a channel is the range of frequencies available for transmission of data through that channel.

Higher the bandwidth, higher the data transfer rate.

Normally, bandwidth is the difference of maximum and minimum frequency contained in the composite signals.

Bandwidth is measured in Hertz (Hz).

1 KHz = 1000 Hz, 1 MHz = 1000

Data Transfer Rate

Data travels in the form of signals over a channel. One signal carries one or more bits over the channel. Data transfer rate is the number of bits transmitted between source and destination in one second. It is also known as bit rate. It is measured in terms of bits per second (bps). The higher units for data transfer rates are:

1 Kbps = 1024 bps

1 Mbps = 1024 Kbps

1 Gbps = 1024 Mbps

IP Address:

An IP address is a unique address that identifies a device on the internet or a local network. IP stands for "Internet Protocol," which is the set of rules governing the format of data sent via the internet or local network.

Switching techniques:

In large networks, there may be more than one path for transmitting data from sender to receiver. Selecting a path that data must take out of the available options is called switching. There are two popular switching techniques – **circuit switching and packet switching**.

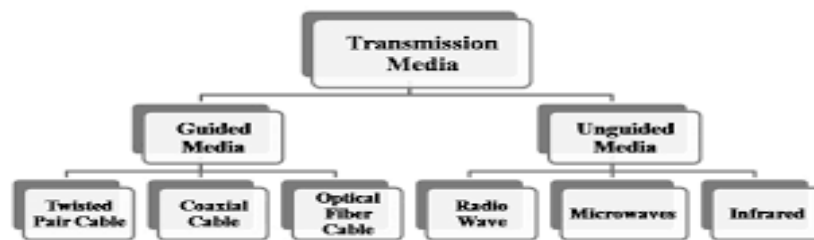
Circuit switching: Circuit switching is a type of network configuration in which a physical path is obtained and dedicated to a single connection between two endpoints in the network for the duration of a dedicated connection. Ordinary landline telephone

service uses circuit switching.

Packet switching: Packet switching is the method by which the internet works; it features delivery of packets of data between devices over a shared network. For example the school web server is sending you a webpage over the internet or you sending an email to a friend.

Transmission Media: Transmission media is a communication channel that carries the information from the sender to the receiver. All the computers or communicating devices in the network must be connected to each other by a Transmission Media or channel.

- A Transmission medium is a medium of data transfer over a network.
- The selection of Media depends on the cost, data transfer speed, bandwidth and distance. Transmission media may be classified as



Transmission Media: Guided (Wired)

Twisted Pair Cable: Twisted pair or Ethernet cable is most common type of media which consists four insulated pairs of wires twisted around each other. It is low-cost, low-weight and easy to install flexible cables. It can transfer data up to 1Gbps speed covering 100 meters distance. It uses RJ-45 Connector for connecting computers and network devices.

Co-axial Cable: This type of cable consists a solid insulated wire surrounded by wire mesh, each separated by some kind of foil or insulator. The inner core carries the signal and mesh provides the ground. Co-axial Cable or Coax, is most common in Cable TV transmission. It can carry data up to 500 meters.

Fiber Optic Cable: Optical fiber consists of thin glass or glass like material and carries light signals instead of electric current. Signal are modulated and transmitted in the form of light pulses from source using Light Emitting Diode (LED) or LASER beam. Optical fibers offer secure and high-speed transmission up to a long distance.

Transmission Media: Unguided (Wireless)

Infrared Wave: It used for short-range (approx. 5 meters) communication using wireless signals. It is mostly used in Remote operated devices like TV, Toys, Cordless phones etc.

Radio waves: Radio wave uses Radio frequencies (3KHz-3 GHz) to make broadcast network like AM/FM network within city. Radio wave propagates in Omni direction (surrounding) and penetrate solid walls/buildings.

Microwaves: Microwave are high energy radio waves, used for line of sight communication using Parabolic antenna aligned with each other. It is high speed wave and can cover distance up to 100 km).

Network Devices: Hardware device that are used to connect computers, printers, fax machines and other electronic devices to a network are called network device. There are many types of network devices used in networking and some of them are described below:

MODEM (Modulator Demodulator): It is a device that converts digital signal to analog signal (modulator) at the sender's site and converts back analog signal to digital signal (demodulator) at the receiver's end, in order to make communication possible via telephone lines. It enables a computer to transmit data over telephone or cable lines.

There are two types of MODEM, which are as follows

- (i) Internal Modem Fixed within a computer.

(ii) External Modem Connected externally to a computer.

Ethernet card: An Ethernet card in your computer serves one basic function: to transmit data from the network to your computer. Ethernet cards are physical expansion cards that insert into a PCI expansion slot on a computer.

RJ45: RJ45 connectors are commonly seen with Ethernet network cables. Ethernet cables with RJ45 connectors are also called RJ45 cables. These RJ45 cables feature a small plastic plug on each end, and the plugs are inserted into RJ45 jacks of Ethernet devices.

Hub: A Hub is a connecting device which connects multiple computers together to form a Local Area Network (LAN). Hubs make broadcast type Network and do not manage traffic over the network channel. Signal entering any port is broadcast out on all other ports. *It broadcast the signals to all computers connected in the network.* It provides various RJ-45 ports to connect Twisted Pair cable in STAR topology, making them act as a single network segment. Now days, Switch is used in place of Hubs.

Types of Hub:

- **Active Hub:** Amplifies the signal when required and works as a Repeater.
- **Passive Hub:** It simply passes the signal without any change.

Switch: A switch is a hardware device, which is used to connect several nodes to form a Network. *It redirects the received signals only to the intended Node i.e. controls Network traffic.*

It is also used to segment a big network into different Sub networks (Subnet) to control the network traffic and security. It can also use to combine various small network segments to form a big Network (as in Tree topology).

Hub V/s Switch: There is a vast difference between switch and hub. A hub forwards each incoming packet (data) to all the hub ports, while a switch forwards each incoming packet to the specified recipient.

Repeater: Repeater is a hardware device, which is used to amplify the signals when they are transported over a long distance. The basic function of a repeater is to amplify the incoming signal and retransmit it, to the other device.

Router: A router is used to connect different networks together. i.e. for two or more LANs to be interconnected, you need a router

- The basic role of Routers in a network is to determine the best possible route (shortest path) for the data packets to be transmitted. In a large network (WAN), multiple routers works to facilitate speedy delivery of data packets.
- Router maintains a table of addresses (called routing table) that keeps a track of paths connected to it.

Gateway:

- A gateway is a device, which is used to connect dissimilar networks. The gateway establishes an intelligent connection between a local network and external networks, which are completely different in structure.
- Gateway is also called protocol converter that convert data packets from one protocol to other and connects two dissimilar networks.
- A gateway can be implemented in hardware, software or both, but they are usually implemented by software installed within a router.
- A LAN gets connected to Internet (WAN) using a gateway.

Network Topologies:

Topology: **Topology** refers to the way in which the device/computer/workstations attached to the network are interconnected.

The layout of interconnection of devices in a network is called Topology.

Different Topologies are: Star, Bus, Tree, Mesh.

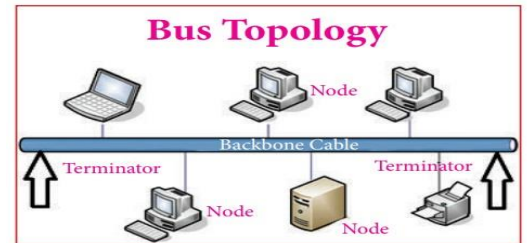
BUS Topology: - The bus topology uses a common single cable (backbone cable) to connect all the workstations. Each computer performs its task of sending messages without the help of the central server. However, only one workstation can transmit a message at a particular time in the bus topology.

Advantages:

- (i) Easy to connect and install.
- (ii) Involves a low cost of installation time.
- (iii) Can be easily extended.

Disadvantages:-

- (i) The entire network shuts down if there is a failure in the central cable.
- (ii) Only a single message can travel at a particular time.
- (iii) Difficult to troubleshoot an error.



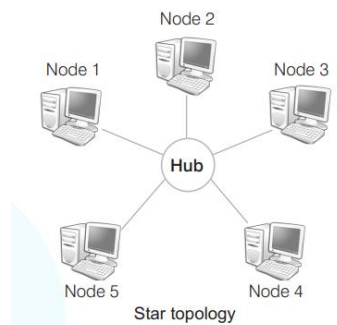
STAR Topology: -In Star topology, each node is directly connected to a central device like Hub or Switch. It is most popular topology to form Local Area Networks (LAN).

Advantages:

- (i) Easy to troubleshoot
- (ii) A single node failure does not affect the entire network.
- (iii) Fault detection and removal of faulty parts is easier.
- (iv) In case a workstation fails, the network is not affected.

Disadvantages: -

- (i) Difficult to expand.
- (ii) Longer cable is required.
- (iii) The cost of the hub and the longer cables makes it expensive over others.
- (iv) All nodes are dependent on central node. if the central device (Switch) goes down then entire network breaks down.



TREE Topology: - The tree topology combines the characteristics of the linear bus and the star topologies. It consists of groups of star – configured workstations connected to a bus backbone cable.

Advantages:

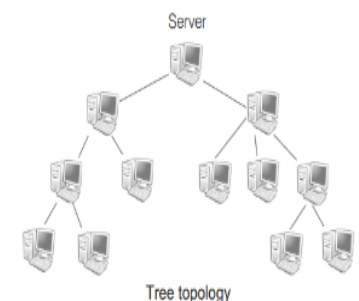
- (i) Eliminates network congestion.
- (ii) The network can be easily extended.
- (iii) Faulty nodes can easily be isolated from the rest of the network.

Disadvantages:

- Uses large cable length.
- Requires a large amount of hardware components and hence is expensive.
- Installation and reconfiguration are very difficult.

Types of Computer Network:

A computer network may be small or big as per number of computers and other network devices linked together. A computer network may contain devices ranging from



handheld devices (like mobile phones, tablets, laptops) connected through Wi-Fi or Bluetooth within a single room to the millions of computers spread across the globe. Based on the size, coverage area, data transfer speed and complexity, a computer network may be classified as:

LAN (Local Area Network): A Local Area Network (LAN) is a network that is limited to a small area. It is generally limited to a geographic area such as within lab, school or building. It is generally privately-owned networks over a distance up to a few kilometers. Now-a-days, we also have WLAN (Wireless LAN) which is based on wireless network.

MAN (Metropolitan Area Network): MAN is the networks cover a group of nearby corporate offices or a city and might be either private or public. Cable TV network or cable based broadband internet services are examples of MAN.

WAN (Wide Area Network): These are the networks spread over large distances, say across countries or even continents through cabling or satellite uplinks are called WAN. Typically, a WAN combines multiple LANs that are geographically separated. It is a network of network. The world's most popular WAN is the Internet.

PAN (Personal Area Network): A Personal Area Network is computer network organized around an individual person. It generally covers a range of less than 10 meters. Personal Area Networks can be constructed with cables or wirelessly.

Comparison between PAN, LAN, MAN and WAN: -

Parameter	PAN	LAN	MAN	WAN
Area covered	Small Area (upto 10m radius)	A building or campus (upto 1 km)	A city (upto 100 Km radius)	Entire country, Continent or Globe
Networking Cost	Negligible	inexpensive	expensive	Very expensive
Transmission	Speed High	High speed	Moderate speed	Low speed
Error Rate	Lowest	Lowest	Moderate	Highest
Network Devices used	WLAN, USB Dongle, Bluetooth	LAN/WLAN, HUB/Switch, Repeater, Modem	Router, Gateway	Router, Gateway
Technology/ Media used	infrared, Bluetooth	Ethernet, Wi-Fi	Optical fiber, Radio wave, Microwave	Microwave, Satellite

Network Protocols:

HTTP (Hyper Text Transfer Protocol) :

- The Hyper Text Transfer Protocol is a set of rules which is used to access/retrieve linked web pages across the web using web browser program.
- The more secure and advanced version is HTTP is HTTPS (HTTP Secure), which controls the transfer of information in encrypted form to provide more security and privacy.
- Other protocols like File Transfer Protocol (FTP) and Telnet can also be used with URL. FTP is used to transfer files from web server to web client or vice-versa.

- Telnet is protocol which used for login on remote computer to access/transfer files or trouble shooting.

FTP (File Transfer Protocol) is a network protocol for transmitting files between computers over Transmission Control Protocol/Internet Protocol (TCP/IP) connections.

Point-to-Point Protocol (PPP) is a TCP/IP protocol that is used to connect one computer system to another. Computers use PPP to communicate over the telephone network or the Internet. A PPP connection exists when two systems physically connect through a telephone line.

TCP/IP stands for **Transmission Control Protocol/Internet Protocol** and is a suite of communication protocols used to interconnect network devices on the internet. TCP/IP is also used as a communications protocol in a private computer network.

TELNET is commonly used by **terminal emulation programs that allow you to log into a remote host**. However, TELNET can also be used for terminal-to-terminal communication and interprocess communication. TELNET is also used by other protocols (for example, FTP) for establishing a protocol control channel.

E-Mail (Electronic Mail):

Email is the short form of electronic mail. It is one of the ways of sending and receiving message(s) using the Internet. An email can be sent anytime to any number of recipients at anywhere. The message can be either text entered directly onto the email application or an attached file (text, image, audio, video, etc.) stored on a secondary storage. An existing file can be sent as an attachment with the email.

E-Mail Protocols:

Email are handled and exchanged through various mail servers in order to deliver email to mail client. The mail client and mail servers exchange information with each other using some protocols. The followings are commonly used protocols for email handling-

SMTP (Simple Mail Transfer Protocol): This protocol is used to send emails from sender to recipient's mail server.

IMAP (Internet Message Access Protocol): This is a standard client/server protocol for accessing e-mails from local e-mail server.

POP3 (Post Office Protocol 3): This protocol facilitates users to access mailboxes and download messages to their computer.

Voice over Internet Protocol (VoIP):

- Voice over Internet Protocol or VoIP, allows voice call (telephone service) over the Internet. VoIP offers voice transmission over a computer network (IP) rather than through the regular telephone network. It is also known as Internet Telephony or Broadband Telephony. Examples of VoIP:- WhatsApp, Skype, Google Chat etc.
- VoIP works on the principle of converting the analogue voice signals into digital and then transmitting them over the broadband line.
- These services are either free or very economical. That is why these days international calls are being made using VoIP.

Overview of Internet:

- Internet is a network of networks that consists of millions of private, public, academic, business, and government networks, that are linked by various wired, wireless, and optical networking technologies.
- The Internet is a global system of interconnected computer networks that use the standard Internet protocol suite (TCP/IP) to serve several billion users worldwide.

- The modern Internet is an extension of ARPANET (Advance Research Project Agency Network), created in 1969 by the American Department of Defense.
- In 1990 the British Programmer Tim Berners-Lee developed Hypertext and HTML to create World Wide Web (WWW).
- The Internet carries an extensive range of information resources and services, such as the inter-linked hypertext documents of the World Wide Web (WWW), the communicational infrastructure to support mail, chat and transfer of Text, Images, Audio, Video etc.

Introduction to web services:

World Wide Web (WWW):

World Wide Web, which is also known as a Web, is a collection of websites or web pages stored in web servers and connected to local computers through the internet. These websites contain text pages, digital images, audios, videos, etc. Users can access the content of these sites from any part of the world over the internet using their devices such as computers, laptops, cell phones, etc. The WWW, along with internet, enables the retrieval and display of text and media to your device.

These sources of the Web (HTML pages) are transferred via the Hypertext Transfer Protocol (HTTP), may be accessed by users by a software application called a web browser, and are published by a software application called a web server.

Tim Berners-Lee—a British computer scientist invented the revolutionary World Wide Web in 1990 by defining three fundamental technologies that lead to creation of www: HTML, URL, HTTP.

HTML(Hyper Text Markup Language):

Hyper Text Markup Language (HTML) is a language which is used to design standardized Web Pages, so that the Web contents can be read and understood from any computer using web browser.

Basic structure of every web page is designed using HTML. HTML uses tags to define the way page content should be displayed by the web browser. Web pages are stored as .html or .htm files.

Extensible Markup Language (XML): Extensible Markup Language is a markup language and file format for storing, transmitting, and reconstructing arbitrary data. It defines a set of rules for encoding documents in a format that is both human-readable and machine-readable.

Domain Name: A domain name is a unique, easy-to-remember address used to access websites, such as 'google.com', and 'facebook.com'.

URL(Uniform Resource Locator):

URL—Uniform Resource Locator is a unique address of web resources located on the web. It provides the location and mechanism (protocol) to access the resource. URL is sometimes also called a web address.

A URL contains protocol, domain, sub domain and name of web page along with directory.

In the above URL, http is the protocol name, it can be https, http, FTP, Telnet, etc. www is a sub domain. ncert.nic.in is the domain name. Textbook is directory and *textbook.htm* is webpage.

The complete unique address of the page on a website is called **URL** (Uniform Resource Locator) e.g. <http://www.cbse.nic.in/welcome.html>

Since computers on the network are identified by its IP addresses, so it is required to convert a Domain name or URL typed in the Browser, in to its corresponding IP address. This process is called Domain Name Resolution. This resolution is done by the designated servers called DNS servers, provided by the Internet Service Providers (ISP) like BSNL, Airtel, Jio etc.

Website:

- Website is a collection of related web pages that may contain text, images, audio and video. The first page of a website is called home page. Each website has specific internet address (URL) that you need to enter in your browser to access a website.
- A website is a collection of web pages related through hyperlinks, and saved on a web server. A visitor can navigate pages by clicking on hyperlinks.
- The main purpose of website is to make the information available to people at large. For example, a company may advertise or sell its products, a government organization may publish circulars, float tenders, invite applications for recruitments etc.
- A website can be accessed by providing the address of the website (URL) in the browser. The main page of website (Home page) will be open when it is opened on the browser.

Web Page:

- A web page is a document on the WWW that is viewed in a web browser. Basic structure of a web page is created using HTML (Hyper Text Markup Language).
- To make web pages more attractive, various styling CSS (Cascading Style Sheets) and formatting are applied on a web page.
- Further, program codes called scripts also used to make webpage interactive and define different actions and behavior. JavaScript, PHP and Python are commonly used script language.
- The first page of the website is called a home page which contains Menus and Hyperlinks for other web pages.
- A web page is usually a part of a website and may contain information in different forms, such as: text, images, audio & video, Hyperlinks, interactive contents (chat etc.)

A web page can be of two types: Static Web Page and Dynamic Web Page

Web Browsers:

- A web browser or simply 'browser' is a software application used to access information on the World Wide Web. When a user requests some information, the web browser fetches the data from a web server and then displays the webpage on the user's screen.
- The popular web browsers are Google Chrome, Mozilla Firefox, Internet Explorer, Opera, Safari, Lynx and Netscape Navigator, Microsoft Edge etc.
- A web browser essentially displays the HTML documents which may include text, images, audio, video and hyperlinks that help to navigate from one web page to another. The modern browsers allow a wide range of visual effects, use encryption for advanced security and also have cookies that can store the browser settings and data.

Web Server:

- A web server is used to store and deliver the contents of a website to web clients such as a browser.
- A Computer stores web server software and a website's contents (HTML pages, images, CSS style sheets, and JavaScript files). The server needs to be connected to the Internet so that its contents can be made accessible to others.
- Web server as a software, is a specialized program that understands URLs or web addresses coming as requests from browsers, and responds to those requests.
- The server is assigned a unique domain name so that it can be accessed from anywhere using Internet. The web browser from the client computer sends a HTTP request for a page containing the desired data or service. The web server then accepts request, interprets, searches and responds (HTTP response) against request of the web browser. The requested web page is then displayed in the browser of the client. If the requested web page is not found, web server generates "Error: 404 Not found" as a response.

Web Hosting:

- A web hosting service is a type of Internet hosting service that allows individuals and organisations to make their website accessible via the World Wide Web. In Simple, uploading of website on Web Server is known as hoisting. To upload the website, we need some web space on server to upload website. This space is available on some nominal charges.
- All web servers are assigned a unique numeric address called IP address when connected to the Internet. This IP address needs to be mapped/changed to domain name (Textual name) of the website using DNS (Domain Name Service). Thus, user can access website by providing domain name through a browser (URL). The domain name has to be registered (purchased) with an authorized agency i.e. Registrar Domain Names.

EXPANDED FORMS

ARPANET= Advance Research Project Agency Network (1969)

NIU= Network Interface Unit

LAN= Local Area Network

MAN= Metropolitan Area Network

WAN= Wide Area Network

ISP= Internet Service Provider

OSS= Open Source Software

ISDN= Integrated Service Digital Network

FLOSS= Free Libre Open Source Software

NIC= Network Interface Card

UTP= Unshielded Twisted Pair

STP= Shielded Twisted Pair

MODEM= Modulator Demodulator

RJ-45= Registered Jack -45

XML= Extensible Markup Language

FTP=File Transfer Protocol

TCP= Transmission Control Protocol

SMTP= Simple Mail Transfer Protocol

POP3= Post Office Protocol 3 (Version 3)

IMAP= Internet Message Access Protocol

IP= Internet Protocol

SLIP= Serial Line Internet Protocol

PPP= Point To Point Protocol

PDA= Personal Data Assistant

GSM= Global System For Mobile

SIM=Subscriber Identity Module

CDMA= Code Division Multiple Access

WLL= Wireless In Local Loop

WWW= World Wide Web

URL=Uniform Resource Locator

DHTML= Dynamic Hyper Text Markup Language

OSS= Open Source Software

GNU= GNU's Not Unix

FSF= Free Software Foundation

OSI= Open Source Initiative

HTTP=Hyper Text Transfer Protocol

HTTPS : Hyper Text Transfer Protocol Secure

HTML= Hyper Text Markup Language

W3C= World Wide Web Consortium

ASP= Active Server Pages

JSP=Java Server Pages

Important Question-Answers as per CBSE Sample Paper 2022-23 Pattern

1-Mark Questions (MCQs, Fill in the blank & One Word answer types)

1. The main computer in any network is called as
(a) Switch (b) Hub (c) Client (d) Server
Ans: (d) Server
2. transmission media has the highest bandwidth.
(a) Co-axial cable (b) Fiber optic cable
(c) Twisted pair cable (d) None of these
Ans: (b) Fiber optic cable
3. Which switching technique follows the store and forward mechanism?
(a) Message (b) Circuit
(c) Packet (d) All of these
Ans: (a) Message
4. Which network topology requires a central controller or hub?
(a) Star (b) Mesh (c) Ring (d) Bus
Ans: (a) Star
5. Data communication system within a building or campus is _____
(a) LAN (b) WAN (c) MAN (d) PAN
Ans: (a) LAN
6. In a network, participating computers are referred to as:
(a) Clients (b) Servers (c) Nodes (d) both a and c
Ans: (c) Nodes
7. Which of the following networking devices forwards data packets between computer networks?
(a) Router (b) Gateway (c) Switch (d) Hub
Ans: (a) Router
8. A device that connects networks with different protocols –
(a) Switch (b) Hub (c) Gateway (d) Proxy Server
Ans: (c) Gateway
9. Which of the following allows user to view a web page?
(a) Website (b) Compiler (c) Web browser (d) Operating System
Ans: (c) Web browser
10. Who invented the World Wide Web(WWW) in 1989?
(a) Robert E Kahn (b) Linus Torvalds (c) Tim Berners-Lee (d) Ted Nelson
Ans: (c) Tim Berners-Lee
11. Protocols are set of rules to govern _____
(a) Communication (b) Standard
(c) Metropolitan communication (d) Bandwidth
Ans: (a) Communication
12. The term HTTP stands for?
(a) Hyper terminal tracing program (b) Hypertext tracing protocol
(c) Hypertext transfer protocol (d) Hypertext transfer program
Ans: Hypertext transfer protocol

Sample Questions of 2-Marks (Short Answer type)

1. Suresh, a Class X student, has just started understanding the basics of Internet and web technologies. He is bit confused in between the terms “ World Wide Web ‘ and ‘Internet’ . Help him in understanding both the terms with the help of suitable examples of each.

Ans: World Wide Web is a set of programs, standards and protocols that allows the multimedia and hypertext files to be created, displayed and linked on the Internet.

Eg: www.microsoft.com, www.amazon.com etc.

Internet is a computer-based worldwide communications network, which is composed of large number of smaller interconnected networks.

Eg: Web, E-mails, Social media etc.

While internet is a collection of computers or networking devices connected together; WWW is a collection of documents, linked via special links called hyperlinks. WWW forms a large part of Internet but is not the Internet.

2. Mahesh, a Class X student, has just started understanding the basics of Internet and web technologies. He is bit confused in between the terms “ Website‘ and ‘Webpage’ . Help him in understanding both the terms with the help of suitable examples of each.

Ans: Website: Website is a collection of web pages displayed on web with a web browser.

It contains more than one webpages.

Webpage: It is a part of website that includes information and content and is displayed on the browser to user. It is a single document display on browser

3. Sushil, a Class X student, has just started understanding the basics of Internet and web technologies. He is bit confused in between the terms “ Web page ‘ and ‘Home Page’ . Help him in understanding both the terms with the help of suitable examples of each.

Ans:

Home Page	Webpage
It is the first or main page of a website	It is a part of website that includes information and content and is displayed on the browser to user.
Every website has this page and appears when the user go to a website.	It is a single document display on browser even home page is also a webpage

4. Yuvika, a Class X student, has just started understanding the basics of Internet and web technologies. She is bit confused about the term ‘web servers’ . Help her in understanding the terms along with the utility of web servers.

Ans: A web server is a computer or a group of computers that hosts or stores content of website.

It processes and delivers web pages of the websites to the users.

The main job of a web server is to display the website content.

A web server provides four major functions:

- (i) Serving web pages
- (ii) Running gateway programs and returning output
- (iii) Controlling access to the server.

Monitoring and logging server access statistics.

5. Neeta is a bit confused between the term URL and Domain Name. Help him in understanding both the terms with the help of suitable explanation using an example.

Ans:

URL	Domain Name
It stands for Uniform Resource locator.	It is a website address.
It is the complete address of a website on the internet.	It is the address we give on browser's search bar to directly access your website
e.g. www.no2jaipur.com/index.html	e.g. cbse.nic.in

6. Nirmala is a bit confused between the terms Web server and Web browsers. Help her in understanding both the terms with the help of suitable example.

Ans:

Web Server	Web Browser
A web server is a computer or a group of computers that hosts or stores content of website. It processes and delivers web pages of the websites to the users. The main job of a web server is to display the website content	A web browser is an application used to access and view websites. Common web browsers include Microsoft Internet Explorer, Google Chrome etc.

7. Neeta is a bit confused between the terms Website and Web hosting. Help her in understanding both the terms with the help of suitable example.

Ans:

Website	Web Hosting
A collection of webpages which are grouped together and usually connected together in various ways is called a website. It is a group of web pages, containing text, images and all types of multimedia files.	Web hosting is the process of uploading/saving the web content on a web server to make it available on WWW (World Wide Web). In case an individual or a company wants to make its website available on the internet, it should be hosted on a web server.

8. Yamini has her own business of Garments but she is unaware about Internet. Give any two application of Internet that could be beneficial for her business.

Ans: (i) Exchanging and communicating among friends and other people.
(iii) Publish information world wide.

9. Virat wants to develop a website. He has to acquire information on webhosting and various services provided in webhosting. Help him to understand about web hosting and its functions.

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

In case an individual or a company wants to make its website available on the internet, it should be hosted on a web server.

10. Raman wants to develop a website for his garments business. He has to acquire information on website and various components of a website. Help him to understand about website and its components.

Ans: Website is a group of web pages, containing text, images and all types of multi-media files.

Components of Website are:

Web host, URL, Home page, Design, Web page with content, Navigation Structure.

11. Kiran needs a network device that should regenerate the signal over the same network before signal becomes weak or corrupted. Arun needs a network device to connect two different networks together that work upon different networking models so that the two networks can communicate properly. Name the devices that should be used by Kiran and Arun.

Ans: Gateway

12. Priyanka is a web developer but is a bit confused between Add-ons and Plug-ins that are used by web browser. Help her to understand the above two terms along with method to install them.

Ans:

Add-ons	Plug-ins
It is either a hardware unit that is added to a computer to increase the capabilities or a program unit that enhances primary program. Examples include card for sound, graphic acceleration, modem capability. Software add-ons are common games, word-processing and accounting program.	It is a software component that adds a specific feature to an existing computer program. When a program supports plug-ins, it enables customization. They are commonly used in internet browsers but also can be utilized in numerous other types of applications.

13. Identify the following device:

- (i) A device that is used to connect different types of dissimilar networks. It performs the necessary translation so that the connected network can communicate properly ?
- (ii) A device that regenerates(amplifies) the received signal and retransmits it to its destination.

Ans: (i) Router

(iii) Repeater

14. How is it easier to diagnose fault in Star topology than in Bus topology ?

Ans: Fault diagnosis is easier in Star topology as if there is any problem in a node will affect the particular node only. While in bus topology, if problem exists in common medium it will affect the entire nodes.

15. A school with 20 stand-alone computers is considering networking them together and adding a server. State 2 advantages of doing this.

Ans: Resource sharing, less cost

16. How is hub different from switch while they both are used for connecting devices in a network ?

Ans: Hub - is an electronic device that connects several nodes to form a network and redirects the received information to all the connected nodes in broadcast mode

Switch - It has the same function as that of a hub: to connect multiple computers/devices in a network. But, it is an intelligent device. It redirects the received information only to the intended node(s).

17. Rehan wants to edit some privacy settings of her browser. How can she accomplish her task ?

Ans: She can accomplish her task by performing following steps:

- Open your web browser.
- Open browser settings.
- Look for privacy and security settings. If not directly found, click on advance settings.

After reaching Privacy and security settings she can edit their settings.

18. What are the different services provided by Web Servers?

Ans: (i) Centralized File Storage

(iv) Resource sharing

(v) Centralized Backup

19. Name any two websites that provide free web hosting?

Ans: WordPress, GoDaddy or any two correct examples.

20. Given the below URL:

https://cbseacademic.nic.in/SQP_CLASSXII_2021-22.html

Identify the following:

(i) Protocol

(ii) Host name

(iii) Domain name

(iv) Domain type

(v) File path

(vi) File name

Ans: Protocol – https

Host name – www

Domain name – cbseacademic.nic.in

Domain type – in

File path - https://cbseacademic.nic.in/SQP_CLASSXII_2021-22.html

File name - SQP_CLASSXII_2021-22.html

21. Given below are two web addresses:

https://cbseacademic.nic.in/SQP_CLASSXII_2021-22.html

<https://cbseacademic.nic.in>

Identify which among the following is a website and which is a web page.

Ans: https://cbseacademic.nic.in/SQP_CLASSXII_2021-22.html- web page

<https://cbseacademic.nic.in>- website

22. Expand the following abbreviations:

(i) HTTP (ii) MODEM (iii) WWW (iv) ARPANET

Ans: (i) Hyper Text Transfer Protocol (ii) Modulator Demodulator

(iii) World Wide Web (iv) Advanced Research Projects Agency Network

23. Expand the following abbreviations:

(i) VPN (ii) DNS (iii) LAN (iv) WAN

Ans: (i) Virtual Private Network (ii) Domain Name System

(iii) Local Area Network (iv) Wide Area Network

24. Expand the following abbreviations:

(i) TCP/IP (ii) E-Mail (iii) MAN (iv) PAN

Ans: (i) Transfer Control Protocol/Internet Protocol (ii) Electronic-Mail

(iii) Metropolitan Area Network (iv) Personal Area Network

25. Expand the following abbreviations:

(i) ISP (ii) URL (iii) VoIP (iv) HTTPs

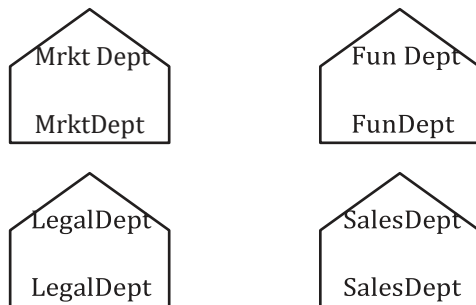
Ans: (i) Internet Service Provider (ii) Uniform Resource Locator

(iii) Voice over Internet Protocol (iv) Hyper Text Transfer Protocol secure

Sample Questions of 5-Marks (Networking application)

Q. 1:

Bhagwati Pvt. Ltd. is setting up the network in Ahmedabad. There are four departments—MrktDept, FunDept, LegalDept and SalesDept.



Distance between various buildings is as under:

MrktDept to FunDept	80 m
MrktDept to LegalDept	180 m
MrktDept to SalesDept	100 m
LegalDept to SalesDept	150 m
LegalDept to FunDept	100 m
FunDept to SalesDept	50 m

Number of computers in the buildings:

MrktDept	20
LegalDept	10
FunDept	08
SalesDept	42

- (i) Suggest the network type between the Departments and specify topology.
- (ii) Suggest the most suitable building to place the server with a suitable reason.
- (iii) Suggest the placement of Hub/Switch in the network.

- (iv) The organization is planning to link its sale counters situated in various parts of the same city. Which type of network out of LAN, WAN, MAN will be formed? Justify.
- (v) Suggest the Economical way for reasonable high speed Internet connectivity.

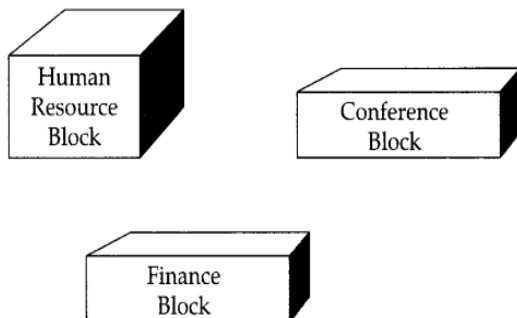
Answer :

- (i) Star topology layout
- (ii) SalesDept , Maximum no. of computer are installed there.
- (iii) Each block
- (iv) MAN, due to all the offices are situated in same city.
- (v) Broadband

Q. 2:

Star Info Solution is a professional consultancy company. The company is planning to set up their new offices in India with its hub at Jaipur. As a network adviser, you have to understand their requirement and suggest them the best available solutions. Their queries are mentioned as (i) to (iv) below.

Physical Locations of the blocked of Company



Block to Block distances (in Mtrs.)

Block (From)	Block (To)	Distance
Human Resource	Conference	110
Human Resource	Finance	40
Conference	Finance	80

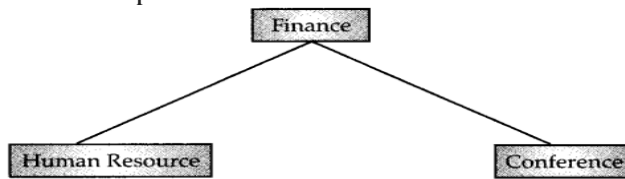
Expected number of computers to be installed in each block.

Block	Computers
Human Resource	25
Finance	120
Conference	90

- (i) What will be the most appropriate block, where company should plan to install their server?
- (ii) Draw a block to cable layout to connect all the buildings in the most appropriate manner for efficient communication.
- (iii) What will be the best possible connectivity out of the following, you will suggest to connect the new setup of offices in Bangalore with its London based office:
 - o Satellite Link
 - o Infrared
 - o Ethernet Cable
- (iv) Which of the following device will be suggested by you to connect each computer in each of the buildings:
 - o Switch
 - o Modem
 - o Gateway
- (v) Which protocol will be used to transfer files over this network?

Answer :

- (i) Finance block because it has maximum number of computers.



- (ii)
- (iii) Satellite link
- (iv) Switch
- (v) FTP

Q. 3:

1. Hello IT Solution is an online, corporate training provider company for IT related courses. The company is setting up their new campus in Mumbai. You as a network expert have to study the physical locations of various buildings and the number of computers to be installed. In the planning phase, provide the best possible answer for the following questions (i) to (v):

Administrative building

Finance building

Faculty Studio building

Buildings	Computers
Administrative Building	20
Finance Building	40
Faculty Studio Building	120

Building to Building distances (in Mtrs.)

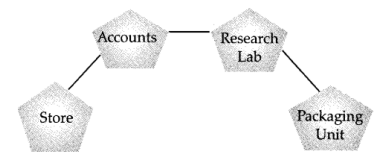
From	To	Distance
Administrative Building	Finance Building	60
Administrative Building	Faculty Studio Building	120
Finance Building	Faculty Studio Building	70

- (i) Suggest the most appropriate building to install the server.
- (ii) Suggest the most appropriate building to building cable layout to connect all three buildings for efficient communication.

- (iii) Which type of network out of the following is formed by connecting the computers of these three buildings?
- LAN
 - MAN
 - WAN
- (iv) Which wireless channel out of the following should be opted by the company to connect to students of all over the world?
- Infrared
 - Microwave
 - Satellite
- (v) Suggest the device to be used to connect all the computers together in each building.

Answer :

- (i) Faculty Studio Building
- (ii) Bus Topology
- (iii) LAN
- (iv) Satellite
- (v) Switch/Hub in each building



Q. 4:

Smart Solution is a skill development organisation which has an aim to promote the standard of skills in the society. It is planning to set up its training centers 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 ABC Nagar, a town (UVW town) and 3 villages.

As a network consultant, you have to suggest the best network related solutions for their issues/ problems raised in (i) to (iv), keeping in mind the distances between various locations and other given parameters.

VILLAGE P TO UVW_TOWN	1.5 KM
VILLAGE Q TO UVW_TOWN	2.0 KM
VILLAGE R TO UVW_TOWN	1.0 KM
VILLAGE P TO VILLAGE Q	2.5 KM
VILLAGE P TO VILLAGE R	4.0 KM
VILLAGE Q TO VILLAGE R	2.3 KM
ABC Nagar Head Office to Cluster	28 KM

Number of computers installed at various locations are as follow :

UVW_TOWN	150
VILLAGE P	10
VILLAGE Q	15
VILLAGE R	20
ABC Nagar Head Office	5

Note:

- In Villagers, there are community centers, 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 Multinational Organizations.

- (i) Suggest the most appropriate location of the SERVER in the Cluster (out of the 4 locations), to get the best and effective connectivity. Justify your answer.
- (ii) Suggest the best wired medium and draw the cable layout (location to location) to efficiently connect various locations within the Cluster.

- (iii) Which hardware device will you suggest to connect all the computers within each location.
- (iv) Which service/protocol will be most helpful to conduct live interactions of Experts from Head Office and people at all locations of Cluster?
- (v) Suggest a system (hardware/software) to prevent unauthorized access to or from the network.

Answer :

- (i) Best location for the server is UVW-TOWN, because it is approximately equidistant from the village P, Q and R.
- (ii) For connectivity between UVW-TOWN to head office is optic Fiber and to connect the villages, P, Q and R with server at UVW- TOWN is co-axial cable.
- (iii) The villages R Q and R can be connected with server at UVW-TOWN by a Hub and the head office is connected by a Bus topology.
- (iv) Between head office and UVWTOWN we recommend for Bus topology, so HTTP protocol and other terminal can be connected by UDP or FTP protocols.
- (v) Firewall

Q. 5:

Alka Institute is planning to set up its center in Bikaner with four specialized blocks for Medicine, Management, Law courses along with an Admission block in separate buildings. The physical distances between these blocks and the number of computers to be installed in these blocks are given below. You as a network expert have to answer the queries raised by their board of directors as given in (i) to (iv).



distances between various locations in meters:

Admin Block to Management Block	60
Admin Block to Medicine Block	40
Admin Block to Law Block	60
Management Block to Medicine Block	50
Management Block to Law Block	110
Law Block to Medicine Block	40

Number of Computers installed at various locations:

Admin Block	150
Management Block	70
Medicine Block	20
Law Block	50

- (i). Suggest the most suitable location to install the main server of this institution to get efficient connectivity.
- (ii). Suggest by drawing the best cable layout for effective network connectivity of the

blocks having server with all the other blocks.

(iii). Suggest the devices to be installed in each of these buildings for connecting computers installed within the building out of the following:

- Modem
- Switch
- Gateway
- Router

(iv) Suggest the most suitable wired medium for efficiently connecting each computer installed in every building out of the following network cables:

- Coaxial Cable
- Ethernet Cable
- Single Pair
- Telephone Cable.

Answer:

i) Admin Block

(ii)



(iii) Modem or Switch or Router

(iv) Ethernet Cable

Q. 6: Adarsh School in Delhi is setting up the network between its different wings. There are 4 wings named as SENIOR(S), MIDDLE(M), JUNIOR(J) and OFFICE(O).

Distance between the various wings are given below:

Wing O to Wing S	100m
Wing O to Wing M	200m
Wing O to Wing J	400m
Wing S to Wing M	300m
Wing S to Wing J	100m
Wing J to Wing M	450m

Number of Computers

Wing O	10
Wing S	200
Wing M	100
Wing J	50

(i) Suggest a suitable Topology for networking the computer of all wings.

(ii) Name the wing where the server to be installed. Justify your answer.

(iii) Suggest the placement of Hub/Switch in the network.

(iv) Where do you install repeater?

(v) Mention an economic technology to provide internet accessibility to all wings

Answer : (i) Star or Bus or any other valid topology.

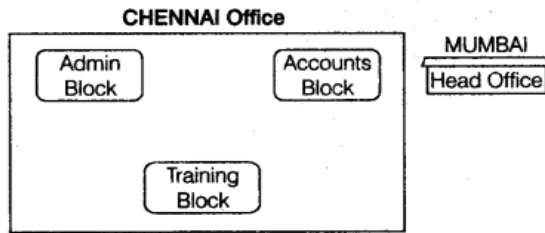
(ii) Wing S, because maximum number of computers are located at Wing S.

(iii) Hub/ Switch in all the wings.

(iv) Coaxial cable/Modem/LAN/TCP-IP/Dialup/DSL/Leased Lines or any other valid technology.

(v) Between those Wings whose distance more than 100m.

Q. 7: Soft Foundation Ltd. is a Mumbai based organization which is expanding its office set-up to Chennai. At Chennai office compound, they are planning to have 3 different blocks for Admin, Training and Accounts related activities. Each block has a number of computers, which are required to be connected in a network for communication, data and resource sharing.



Shortest distances between various blocks/locations:

Admin Block to Accounts Block	300 Metres
Accounts Block to Training Block	150 Metres
Admin Block to Training Block	200 Metres
MUMBAI Head Office to CHENNAI Office	1300 Km

Number of computers installed at various blocks are as follows:

Training Block	150
Accounts Block	30
Admin Block	40

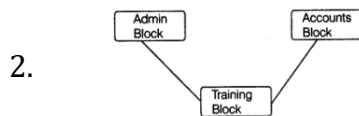
As a network consultant, you have to suggest the best network related solutions for them for issues/problems raised by them in 1 to 5, as per the distances between various blocks/locations and other given parameters.

1. Suggest the most appropriate block/location to house the SERVER in the CHENNAI office (out of the 3 blocks) to get the best and effective connectivity. Justify your answer.

2. Suggest the best wired medium and draw the cable layout (Block to Block) to efficiently connect various blocks within the CHENNAI office compound.

- Suggest a device/software and its placement that would provide data security for the entire network of the CHENNAI office.
- Suggest a device and the protocol that shall be needed to provide wireless Internet access to all Smartphone/laptop users in the CHENNAI office.
- Device required connecting computers together in each block.

Answer :



1. Training Block due to having maximum computers.

- Firewall
- Device: Wi-Fi Card and protocol: TCP/IP
- Hub /Switch In each block

Q. 8: DM Center has set up its new center in Kolkata. It has four buildings as shown in the diagram given below:

Distance between various buildings

Accounts to research Lab	55m
Accounts to store	150m
Store to packaging unit	160m
Packaging unit to research lab	60m
Accounts to packaging unit	125m

Accounts

Research Lab

Store to research lab	180m
-----------------------	------

Store

Packaging unit

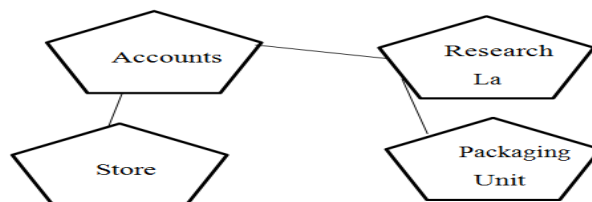
Number of Computers

Accounts	25
Research Lab	100
Store	15
Packaging Unit	60

As a network expert, provide the best possible answer for the following queries:

- Suggest a cable layout of connections between the buildings.
- Suggest the most suitable place (i.e. buildings) to house the server of this organization.
- Suggest the placement of the following device with justification: Repeater
- Suggest the placement of the following device with justification: Hub/Switch
- Suggest a system (hardware/software) to prevent unauthorized access to or from the network.

Answer: (i) Layout



- The most suitable place/ building to house the server of this organization would be building Research Lab, as this building contains the maximum number of computers
- For layout1, since the cabling distance between Accounts to Store is quite large, so a repeater would ideally be needed along their path to avoid loss of signals during the course of data flow in this route. For layout2, since the cabling distance between Stores to Research Lab is quite large, so a repeater would ideally be placed.
- In both the layouts, a Hub/Switch each would be needed in all the buildings to interconnect the group of cables from the different computers in each building.
- Firewall

Q. 9:

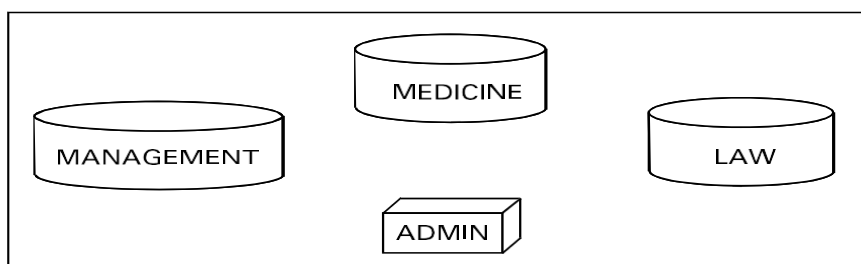
Professional Training Institute is planning to set up its centre in Amritsar with four specialized blocks for Medicine, Management, Law courses along with an Admission block in separate buildings. The physical distances between these blocks and the number of computers to be installed in these blocks are given below. You as a network expert have to answer the queries as raised by their board of directors as given in (i) to (v).

Shortest distances between various locations in metres:

Admin Block to Management Block	60
Admin Block to Medicine Block	40
Admin Block to Law Block	60
Management Block to Medicine Block	50
Management Block to Law Block	110
Law Block to Medicine Block	40

Number of Computers installed at various locations are as follows :

Admin Block	150
Management Block	70
Medicine Block	20
Law Block	50



- (i) Suggest the most suitable location to install the main server of this institution to get efficient connectivity.
- (ii) Suggest the devices to be installed in each of these buildings for connecting computers installed within the building out of the following :
 - Modem
 - Switch
 - Gateway
 - Router
- (iii) Suggest by drawing the best cable layout for effective network connectivity of the blocks having server with all the other blocks.
- (iv) Suggest the most suitable wired medium for efficiently connecting each computer installed in every building

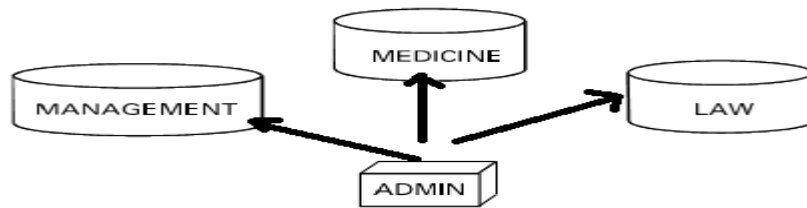
out of
the following network cables :

- Co-axial Cable
- Ethernet Cable
- Single Pair Telephone Cable

(v) Suggest the Economical way for reasonable high speed Internet connectivity.

Answer :

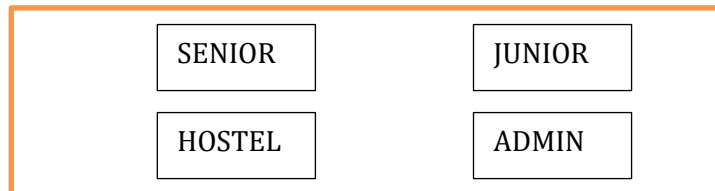
- (i) Admin Block
- (ii) Switch
- (iii)



- (iv) Ethernet Cable
- (v) Broadband

Question 10:

Smart School, in Jaipur is starting up the network between its different wings. There are four Buildings named as SENIOR, JUNIOR, ADMIN and HOSTEL as shown below:



The distance between various buildings

ADMIN TO SENIOR	200 M
ADMIN TO HOSTEL	50 M
ADMIN TO JUNIOR	150 M
JUNIOR TO HOSTEL	340 M
SENIOR TO HOSTEL	300 M
SENIOR TO JUNIOR	250 M

Number of Computers in Each Building

SENIOR	130
JUNIOR	80
HOSTEL	50
ADMIN	160

- (i) Suggest the cable layout of connections between the buildings.
- (ii) Suggest the most suitable place (i.e., building) to house the server of this school, provide a suitable reason.
- (iii) Suggest a system (hardware/software) to prevent unauthorized access to or from the network.

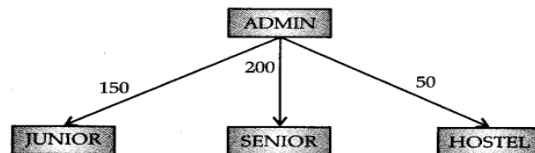
(iv) Suggest the placement of the following devices with justification.

- Repeater
- Hub/Switch

(v) The organisation also has inquiry office in another city about 50-60 km away in hilly region. Suggest the suitable transmission media to interconnect to school and inquiry office out of the following :

- Fiber optic cable
- Microwave
- Radio wave

Answer :



(i)

(ii) Server can be placed in the ADMIN building as it has the maximum number of computer.

(iii) Firewall.

(iv) Repeater can be placed between ADMIN and SENIOR building as the distance is more than 110 m.

(v) Radio waves can be used in hilly regions as they can travel through obstacles.

DATABASE MANAGEMENT

INTRODUCTION OF DATABASE CONCEPTS AND IT'S NEED

Database is a collection of interrelated data stored together to serve multiple applications.

DBMS: DBMS(Data Base Management System) refers to a software that is responsible for storing, maintaining and utilizing database.

Examples of database management systems are: MS-Access, MySQL, PostgreSQL, SQLite, Microsoft SQL Server, Oracle, SAP, DBASE, FoxPro, etc.

Advantage of Database System :-

- i. Database reduces redundancy(duplicacy of data)
- ii. Database controlled data inconsistency
- iii. Sharing of data
- iv. Integrated data
- v. Database provide security
- vi. Standardized data

RELATIONAL DATA MODEL:- In the relational data model, the data is stored/organized into tables. These tables are called relation. Database is represented as collection of related tables. Each table is termed as relation and has its unique name in the relational data model. A Table is a collection of rows and columns. A row (horizontal subset) of a table represents a tuple or record, while column (vertical subset) of a table represents an attribute.

TERMINOLOGIES OF RDBMS:

RELATION: A relation means a 'table', in which data are organized/consist in the form of rows and columns. Therefore, in database, relations are also known as tables. For example

TABLE: TEACHER

TID	TNAME
101	SUMAN
203	SUMIT

RELATION/TABLE: STUDENT

ADMNO	NAME	GENDER	CLASS	SECTION	MARKS
101	ANU	F	12	A	85
105	BALU	M	12	D	65
203	REENA	F	11	B	92
205	MADHU	F	10	B	75
305	MANOJ	M	9	C	70

DOMAIN: A domain is a set of values of a particular data type that are allowed to be used in a column of a database table.

For example:

- i) The domain of gender column has a set of two possible values i.e, Male or Female.
- ii) The domain of section column has a set of four possible values i.e A, B, C, D.

TUPLE/RECORD/ROW: Horizontal subset/information in a table is called tuple. The tuple is also known as a 'record', which gives particular information of the relation (table). For example: In Student table, one row gives information about one student only.

ATTRIBUTE/COLUMN: Vertical subset of a table is called attribute/column/field. For example: In Student Table ADMNO, NAME, GENDER, CLASS, SECTION, MARKS are the columns.

DEGREE OF TABLE/RELATION: Total number of attributes/column/fields is known as Degree of relation. For example: In above Student table/relation degree=6

CARDINALITY OF TABLE/RELATION: Total number of rows/records/tuples in a table is known as Cardinality of a table. For example: In above Student table/ relation cardinality=5

NOTE: if more than one tables are given and performed Cartesian product then resultant

table degree= Total no. of column table1 + Total no. of column table2 and

cardinality = Total no. of rows of table1 * Total no. of rows of table2

KEYS: it is important/key part of the structure of a table. It helps enforce integrity and help identify the relationship or links between tables.

Primary Key: A column or set of columns that uniquely identifies a row within a table is called primary key. Possible candidate keys of student table are AdmNo, Name and Marks serve the best primary key is AdmNo. Only one primary key possible in one relation.

Candidate Key: Candidate keys are set of fields (columns with unique values) in the relation that are eligible to act as a primary key.

In the above table student, AdmNo and Name, Marks has unique values. Therefore, AdmNo, Name and Marks are candidate keys.

Alternate/Alter Key: Out of the candidate keys, after selecting a key as primary key, the remaining keys are called alternate/ alter keys. Possible candidate keys of student table are AdmNo, Name and Marks. Here the best primary key is AdmNo and the remaining attributes of candidate keys become the alternate keys which are Name and Marks.

Foreign Key: A foreign key is a field (or collection of fields) in one table that uniquely identifies a row of another table. In other words, a foreign key is a column or a combination of columns that is used to establish a link between two tables. Foreign key is referenced from the Primary Key column of Master/Base/Parent table and the table in which the foreign key is referenced is called as Detailed/ Derived/ Child Table.

Structured Query Language (SQL) : SQL is a standardized programming language that is used to manage relational databases and perform various operations on the data in those tables. SQL provides statements for defining the structure of the data, manipulating data in the database, declaring constraints and retrieving data from the database in various ways, depending on our requirements. SQL is not a case sensitive language.

Types of SQL commands:- SQL commands are classified as:

(i) Data definition language (DDL) and (ii) Data manipulation language (DML)

DATA DEFINITION LANGUAGE(DDL)- SQL allows us to write statements for defining, modifying and deleting relation schemas/ physical structure of table. DDL commands are CREATE, ALTER, DROP etc.

DATA MANIPULATION LANGUAGE- This allows us to write SQL statements for adding, updating and deleting the data (values) from the table. DML commands are INSERT, UPDATE, DELETE etc.

Datatypes in SQL:- Commonly used to identifying the values given by user. Data types in MySQL are numeric types, date and time and string types.

Data type	Description
CHAR(n)	Specifies character type data of length n where n could be any value from 0 to 255. CHAR is of fixed length means declaring CHAR (10) implies to reserve spaces for 10 characters. If data not have 10 characters (e.g., 'city' has four characters), MySQL fills the remaining 6 characters with blank spaces padded on the right.
VARCHAR(n)	Specifies character type data of length where n could be any value from 0 to 65535. But unlike CHAR, VARCHAR(n) is a variable-length data type. That is, declaring VARCHAR (30) means a maximum of 30 characters can be stored but the actual allocated bytes will depend on the length of entered string. So 'city' in VARCHAR (30) will occupy space needed to store 4 characters only.

INT	INT specifies an integer value. Each INT value occupies 4 bytes of storage. The range of unsigned values allowed in a 4 byte integer type are 0 to 4,294,967,295. For values larger than that, we have to use BIGINT, which occupies 8 bytes.
FLOAT	Holds numbers with decimal points. Each FLOAT value occupies 4 bytes.
DATE	The DATE type is used for dates in 'YYYY-MM-DD' format. YYYY is the 4 digit year, MM is the 2 digit month and DD is the 2 digit day. The supported range is '1000-01-01' to '9999-12-31'.

Constraint: - These are the certain types of restrictions on the data values that an attribute can have. If we apply constraints on single attribute, it is known as column constraint and if we apply on more than one attribute than known as table constraint.

Commonly used SQL Constraints: -

Constraint	Description
NOT NULL	Ensures that a column cannot have NULL values where NULL means empty/missing/ unknown/not applicable value.
UNIQUE	Ensures that all the values in a column are distinct/unique.
PRIMARY KEY	The column which can uniquely identify each row/record in a table.

SQL Commands:-

SHOW DATABASES:- This command used to display list of all databases. By default, it shows three databases- information_schema, mysql, test.

mysql> show databases;

```
+-----+
| Database      |
+-----+
| information_schema |
| mysql          |
| test           |
+-----+
```

3 rows in set (0.00 sec)

CREATE DATABASE: - This command used to create new database.

Standard Syntax: - CREATE DATABASE <NAME OF DATABASE>;
CREATE DATABASE SCHOOL;

We created new database SCHOOL. if we want to see it then use
SHOW DATABASES;

USE DATABASE: - This command is used to select a database on which we want to work.
USE SCHOOL;

DROP DATABASE:- This command used to permanently remove the particular database.
Standard Syntax: - DROP DATABASE <NAME OF DATABASE>;
DROP DATABASE SCHOOL;

This command removes the school database permanently.

SHOW TABLES:- This command we used to display the list of all the tables under a particular database.

Standard Syntax: SHOW TABLES;

CREATE TABLE:- This command used to create new table under a particular database like school.

USE SCHOOL;

Standard Syntax: CREATE TABLE <tablename>
(attributename1 datatype constraint,
attributename2 datatype constraint,
attributenameN datatype constraint);

```

CREATE TABLE EMP          # Creating New Table/Relation as emp
(empid int not null primary key, #attribute-empid,datatype int, constraint -not null &
                               primary key
ename varchar(30),        # attribute -ename, datatype-varchar and size-30
doj date,
dept varchar(32) unique,
salary float(8,2)
);

```

When we create table, we can also find degree of table/relation- To count number of attributes/columns. In above Relation of emp **Degree=5**.

DESCRIBE TABLE NAME- This is used to check/show physical structure of table and data types, constraints which we created. It also help us when we add rows in table.

NOTE:- When we add rows we assign values according to given data type and constraints. Standard Syntax: DESCRIBE TABLE NAME;

```
DESCRIBE EMP;
```

Structure of EMP table.

Field	Type	Null	Key
empid	int(11)	NO	PRI
ename	varchar(30)	YES	
doj	date	YES	
dept	varchar(32)	YES	
salary	float(8,2)	YES	

Changing Structure of table: -

ALTER TABLE :- When we define the system, we specify what data we need to store, the size and data type of that data. What can we do when the requirements change? We can alter the table to accommodate the changed requirements.

Alter table command is used to change definition of existing tables.

ALTER TABLE is used to- (i) To add a new column (ii) To add an integrity constraints (iii) To redefine a column (data type, size, default value).

ADD clause: Syntax to add new column to a table-

```
ALTER TABLE <TABLE_NAME>
```

```
ADD <COLUMN_NAME> < DATA TYPE> ( <SIZE> ) <CONSTRAINT NAME>;
```

e.g. - **ALTER TABLE EMP ADD MOBNO INT(12);** (# here table name is EMP)

Modify clause-If we want to make changes in data type and its size.

```
ALTER TABLE EMP MODIFY DEPT CHAR(30);
```

We can change data type from varchar to char and its size also.

Drop clause: If we want to remove the attribute of a table. Then we may use the DROP clause of ALTER TABLE.

```
ALTER TABLE EMP DROP DEPT;
```

Here we removed dept column from the emp table.

Note: Similarly we can also add/remove the constraints using ADD and DROP clause.

```
ALTER TABLE EMP ADD PRIMARY KEY (NAME OF ATTRIBUTE);
```

```
ALTER TABLE EMP ADD PRIMARY KEY ENAME;
```

(here we added primary key constraint on ename column.)

```
ALTER TABLE EMP DROP PRIMARY KEY;
```

(here we removed primary key from table emp.)

DROP TABLE Command:-If we want to remove the table from the database permanently. Standard syntax: DROP TABLE <TABLE_NAME>;

DROP TABLE EMP;

INSERT INTO Command: This command used to add new row in relation/table.

Standard Syntax: INSERT INTO TABLE _NAME VALUES(according to data types);

to add single row

We can also add one row or a particular values in row:

INSERT INTO TABLE_NAME (Attributes name1, name2, name3) VALUES (According to data type);

We can add multiple rows also by using-

INSERT INTO TABLE_NAME VALUES(according to data types),
(According to data type another row);

INSERT INTO EMP VALUES(1,'RAVI','2008-10-4','MATHS',50000);

Except numeric data type values must be in form of string.

INSERT INTO EMP VALUES(1,'RAVI','2008-10-4','MATHS', 50000),
(2,'SWETA','2012-12-6','HINDI',40000); #adding multiple rows.

SELECT Command:- The SELECT statement is used to select data from a database. This command is used to view/retrieved table information from SQL database.

SELECT column1, column2,...FROM table_name;

Here, column1, column2, ... are the field_names of the table we want to select data from.

If you want to select all the fields available in the table, use the following syntax:

SELECT * FROM table_name;

The SQL WHERE Clause:

The **WHERE** clause is used to filter records. It is used to extract only those records that fulfill a specified condition.

Syntax:-

SELECT column1, column2, ...
FROM table_name
WHERE condition;

Example:Display all the details of employee whose department science.

```
SELECT * FROM EMP  
WHERE DEPT='SCIENCE';
```

Arithmetic operators: Arithmetic operator takes two operands and performs a mathematical calculation on them. However, they can be used only in SELECT command.

The arithmetic operators used in SQL are: + Addition, - Subtraction, *Multiplication, / Division.

```
SELECT 2+ 5 FROM EMP;
```

RELATIONAL OPERATORS:- These are used to implement comparison between two operands. These operators can be used only in 'where clause'. Relational operators are - < less than, > greater than, <= less than or equal to, >= greater than equal to, = equal to, != not equal to.

Example- Display all the details of employee whose salary greater than or equal to 3000 and less than 60000.

```
SELECT * FROM EMP WHERE SALARY>=30000 AND SALARY< 60000;
```

LOGICAL OPERATORS:- These are also possible only in 'where clause' and are used to merge more than one condition. Logical operators are - **and, or, not.**

Example - Display details of all employee whose employee id is 2 or 3.

```
SELECT * FROM EMP WHERE EMPID=2 OR EMPID=3;
```

RENAMING OF COLUMNS (ALIASING using AS):- When we want to change name of

column for Displaying output AS clause should be use. Example- Display ename as name of employee. `SELECT ENAME AS NAME FROM EMP;`

DISTINCT CLAUSE:- This clause used with SELECT to display different data of particular attribute (remove the repetition of data/removed the duplication of data).

Example - `SELECT DISTINCT(DEPT) FROM EMP;` it will display different department of table employee.

WHERE CLAUSE: The WHERE clause is **used to filter records**. It is used to extract only those records that fulfil a specified condition.

Example- Display all the details of those employee whose employee_id is 1 and 2.

`SELECT * FROM EMP WHERE EMPID=1 OR EMPID=2;`

IN OPERATOR:- The IN operator allows us to specify multiple values in a WHERE clause. We also say work like or operator from logical operators.

Example-Display all the details of employee whose department as hindi, maths or science.

`SELECT * FROM EMP WHERE DEPT IN('HINDI','MATHS','SCIENCE');`

`SELECT * FROM EMP WHERE DEPT='HINDI' OR DEPT='MATHS' OR DEPT='SCIENCE';`

BETWEEN CLAUSE:- The BETWEEN operator selects values within a given range. The values can be numbers, text, or dates.

The BETWEEN operator is inclusive: begin and end values are included.

Example-Display employee_name and salary of those employee whose salary 30000 to 40000.

`SELECT ENAME, SALARY FROM EMP WHERE SALARY BETWEEN 30000 AND 40000;
OR`

`SELECT ENAME SALARY FROM EMP WHERE SALARY>=30000 AND SALARY<=40000;`

ORDER BY: The **ORDER BY** keyword is used to sort the result-set in ascending or descending order.

The **ORDER BY** keyword sorts the records in ascending order by default. To sort the records in descending order, use the **DESC** keyword.

Example- Display all the details of employee in ascending order of department.

`SELECT * FROM EMP ORDER BY DEPT;`

NULL VALUE:- SQL supports a special value called NULL to represent a missing or unknown value. NULL is used to represent such unknown values. It is important to note that NULL is different from 0 (zero). Also, any arithmetic operation performed with NULL value gives NULL.

IS NULL:- In order to check for NULL value in a column, we use IS NULL operator.

`SELECT * FROM EMP WHERE DOJ IS NULL;`

It displays only those tuples which have DOJ as NULL.

IS NOT NULL:- In order to check for not NULL value in a column, we use IS NOT NULL operator.

`SELECT * FROM EMP WHERE DOJ IS NOT NULL;`

It displays only those tuples which does not have DOJ as NULL.

LIKE CLAUSE:- SQL provides a LIKE operator that can be used with the WHERE clause to search for a specified pattern in a column.

The LIKE operator makes use of the following two wildcard characters:

- % (per cent)- used to represent zero, one, or multiple characters (% -means anything)
- _ (underscore) - used to represent exactly a single character.

Display details of all those employees whose name starts with 'R'.

`SELECT * FROM EMP WHERE ENAME LIKE 'R%';`

Display details of all those employees whose name have second letter as 'A'.

`SELECT * FROM EMP WHERE ENAME LIKE '_A%';`

Here are some examples showing different **LIKE** operators with '%' and '_' wildcards:

LIKE Operator	Description
WHERE CustomerName LIKE 'a%'	Finds any values that start with "a"
WHERE CustomerName LIKE '%a'	Finds any values that end with "a"
WHERE CustomerName LIKE '%or%'	Finds any values that have "or" in any position
WHERE CustomerName LIKE '_r%'	Finds any values that have "r" in the second position
WHERE CustomerName LIKE 'a_%'	Finds any values that start with "a" and are at least 2 characters in length
WHERE CustomerName LIKE 'a__%'	Finds any values that start with "a" and are at least 3 characters in length
WHERE ContactName LIKE 'a%o'	Finds any values that start with "a" and ends with "o"

UPDATE Command:- The UPDATE statement is used to make modifications in existing data.

If we use this data after modification then results of output will come as per changes means changes will be permanently in data.

Standard Syntax: UPDATE table_name SET attribute1 = value1, attribute2 = value2, ...
WHERE condition;

UPDATE EMP SET SALARY=SALARY+1000 WHERE EMPID=2 OR EMPID=5;

It will modify the salary by 1000 of those employee whose Empid as 2 or 5.

DELETE Command:- This command use to remove rows/tuples from the relation but not delete Structure of table.

Standard Syntax: DELETE FROM TABLE_NAME WHERE [CONDITION];

By using this command we can delete a particular row.

To delete all the rows - DELETE * FROM TABLE_NAME;

DELETE FROM EMP WHERE EMPID=1;

AGGREGATE FUNCTIONS:- An aggregate function performs a calculation on a set of values, and returns a single value. Aggregate functions are- SUM(), MIN(), MAX(), AVG(), COUNT(), COUNT(*).

MAX(column)	Returns the largest value from the specified column.	mysql> SELECT MAX(Price) FROM PRODUCT;
MIN(column)	Returns the smallest value from the specified column.	mysql> SELECT MIN(Price) FROM PRODUCT;
AVG(column)	Returns the average of the values in the	mysql> SELECT AVG(Price) FROM PRODUCT;

	specified column.	
SUM(column)	Returns the sum of the values for the specified column.	mysql> SELECT SUM(Price) FROM INVENTORY;
COUNT(*)	Returns the number of records in a table. Note: In order to display the number of records that matches a particular criteria in the table, we have to use COUNT(*) with WHERE clause.	mysql> SELECT COUNT(*) from PRODUCT;
COUNT(column)	Returns the number of values in the specified column ignoring the NULL values.	SELECT COUNT(MEMNAME) FROM PRODUCT;

GROUP BY CLAUSE:- The **GROUP BY** statement groups rows that have the same values into summary rows, like "find the number of customers in each country".

The **GROUP BY** statement is often used with aggregate functions (**COUNT()**, **MAX()**, **MIN()**, **SUM()**, **AVG()**) to group the result-set by one or more columns.

EXAMPLE- `SELECT COUNT(*) SALARY FROM EMP GROUP BY DEPT;`

It display result with count salary each group of department.

HAVING CLAUSE:- As mentioned earlier, the 'where' clause is used only to place condition on the selected columns, whereas the 'HAVING' clause is used to place condition on groups created by 'group by' clause, because here the 'WHERE' clause is not useable.

EXAMPLE-Display to count dept of those employee according to department, whose department is more than one.

```
SELECT COUNT(*) SALARY FROM EMP
GROUP BY DEPT HAVING COUNT(*) >1;
```

JOINS:- JOIN operation combines tuples from two tables on specified conditions.

CARTESIAN PRODUCT OF TWO TABLES: This is applied on two tables results in a table having all combinations of tuples from the underlying tables. When more than one table is to be used in a query, then we must specify the table names by separating commas in the FROM clause,

```
SELECT * FROM TEACHER, STU;
```

It will display all combinations of tuples from both tables.

EQUI JOIN:- Equi Joins are used to give information in different tables. It is a special type of join in which we use only equality operator.

```
SELECT * FROM TEACHER, STU WHERE TEACHER.TID=STU.ADM;
```

It display all tuples whose id matches.

NATURAL JOIN:- This operator can be used to join the contents of two tables if there is one common attribute in both the tables. The common column will display only once and display the tuples according to common attributes.

```
SELECT * FROM TEACHER NATURAL JOIN STU;
```

INTERFACE OF PYTHON WITH AN SQL DATABASE:

We need input from the user using python Interface that is known as Front End (Basic application programming is there, which provides the Graphical User Interface(GUI) for input values from user) and we want to save data permanently on hard disk for modification, deletion and retrieval. These data directly not accessible to the user so that we make the connection python with MySql (database) that is known as Back End Database.

Steps to connecting python with MySql are:

(i) To check in computer/Laptop that python and MySql softwares are installed or not, if not installed then First Installed those.

(ii) Upgrade the version pip using: Path of python\python.exe -m pip install --upgrade pip on command prompt.

Example: C:\Users\HP>AppData\Local\Programs\Python\Python310\python.exe -m pip install --upgrade pip

(iii) Install the driver of MySQL using: Path up to Script\pip install mysql.connector

Example:C:\Users\HP>AppData\Local\Programs\Python\Python310\Scripts\pip install mysql.connector and check on python import mysql.connector driver installed or not.

(iv) To find user and host we use:

```
select current_user(); #It gives user and local host names.
```

(iv) To establish the connection, write program on scripting mode:

```
import mysql.connector #To check driver of MySQL installed or not
mydb=mysql.connector.connect(host='localhost',user='root',passwd='tiger')
# connect() statement create a connection to the MySQL server and returns a MySQL
connection object mydb and pass three parameters if required than also pass database
parameter.
```

```
print(mydb) #It displays the message of mydb object connection established or not
<mysql.connector.connection.MySQLConnection object at 0x0000017590025000>
```

(v) Creating cursor object of a class cursor which allows python code to execute database.

```
Mycursor=mydb.cursor()
```

(vi) Mycursor.execute("Write query of MySQL") #To execute SQL queries from python.

(vii) To save the current transactions of inserting, updating and deleting data we use:

```
mydb.commit()
```

(viii) To read the data(rows) using fetchone()/ fetchmany(2)/ fetchall() methods as per our requirement and returned result in form of list or we can also use for loop to retrieving all rows with fetch or without fetch result in form of tuple and one by one record.

Note: fetchone() method give only one record at a time and we cannot pass parameter.

fetchmany(size) will pass one parameter and display records according to pass

parameter

fetchall() will display all the records and can not pass parameters.

(ix) rowcount: This is a read only attributes and returns the number of rows that were affected by an execute method. Syntax: object of cursor.rowcount.

INSERT RECORD:-

```
import mysql.connector
mydb=mysql.connector.connect(host='localhost',user='root',passwd='tiger',database=
'school')
mycursor=mydb.cursor()
mycursor.execute("INSERT INTO EMP VALUES(%s,%s,%s,%s,%s)",(7,'MANISH',
'2009-01-12','ENGLISH',45000))
mydb.commit()
print(mycursor.rowcount, "record inserted/added")
```

UPDATE RECORD:

```
import mysql.connector
mydb=mysql.connector.connect(host='localhost',user='root',passwd='tiger',database=
'school')
mycursor=mydb.cursor()
mycursor.execute("UPDATE EMP SET SALARY=35000 WHERE EMPID=1")
mydb.commit()
print(mycursor.rowcount,"record updated")
```

DELETE RECORD:

```
import mysql.connector
mydb=mysql.connector.connect(host='localhost',user='root',passwd='tiger',database=
'school')
mycursor=mydb.cursor()
mycursor.execute("DELETE FROM EMP WHERE EMPID=4")
mydb.commit()
print(mycursor.rowcount,"record deleted")
```

TO DISPLAY ALL RECORDS:

```
import mysql.connector
mydb=mysql.connector.connect(host='localhost',user='root',passwd='tiger',database=
'school')
mycursor=mydb.cursor()
mycursor.execute("SELECT * FROM EMP")
myrec=mycursor.fetchall()
print(myrec)          # It will display all records in form of list
for i in myrec:       #it will display all records in form of tuple and record by record.
    print(i)
    print(mycursor.rowcount)# To count total no of records fetched by execute method.
```

QUESTIONS-1 MARKS(MYSQL)

1. A relation can have only one _____ key and may have more than one _____ keys.
 - a) Primary, Candidate
 - b) Candidate, Alternate
 - c) Candidate, Primary
 - d) Alternate, Candidate
2. The vertical subset of a table is known as:
 - a) Tuple
 - b) Row
 - c) Attribute
 - d) Relation
3. If software is released under open source, it means:
 - a) It is expensive.
 - b) Its source code is available to the user.
 - c) It belongs to a company.
 - d) It is a DBMS.
4. Which of the following columns in a Student table can be used as the primary key?
 - a) Class
 - b) Section
 - c) First_Name
 - d) Admission_No
5. A tuple is also known as a _____.
 - a) table
 - b) relation
 - c) row
 - d) field
6. An attribute is also known as a _____.
 - a) table
 - b) relation
 - c) row
 - d) column
7. A field or a combination of fields in a table that has a unique value for each row is called:
 - a) Candidate key.
 - b) Foreign key.
 - c) Main key.
 - d) Alternate key.
8. Number of rows in a table is called
 - a) Power
 - b) Degree
 - c) Cardinality
 - d) Design
9. Number of columns in a table is called
 - a) Power
 - b) Degree
 - c) Cardinality
 - d) Design
10. Which key provide link between two tables
 - a) Candidate key.
 - b) Foreign key.
 - c) Main key.
 - d) Alternate key.

Answers:-

Q1	Q2	Q3	Q4	Q5
A	C	B	D	C
Q6	Q7	Q8	Q9	Q10
D	A	C	B	B

QUESTIONS-1 MARKS(MYSQL)

- Q1. Which statement is used to retrieve data from a table?
 - A. SELECT
 - B. DISPLAY
 - C. READ
 - D. EXTRACT
- Q2. How do you select all the columns from a table named "Employee"?
 - A. SELECT [all] FROM Employee;
 - B. SELECT Employee;
 - C. SELECT * BY Employee;
 - D. SELECT * FROM Employee ;
- Q3. How do you select a column named "Name" from a table named "Inventory"?
 - A. SELECT Inventory FROM name;
 - B. DISPLAY name FROM Inventory;
 - C. SELECT name FROM Inventory;
 - D. SELECT Name, Inventory FROM name;
- Q4. Which of the following are invalid column names?
 - A. Marks_ Eng
 - B. 66_Marks
 - C. MarksEng
 - D. _Eng_Marks
- Q5. SELECT statement can be used to perform these functions.
 - A. Insert rows into a table.
 - B. Choose and display columns from a table.
 - C. Modify data in a table.
 - D. Select and display structure of a table.
- Q6. Which statement is used to add new tuple in a table?
 - A. ADD RECORD
 - B. INSERT RECORD
 - C. INSERT INTO
 - D. INSERT ROW
- Q7. How would you display all those rows from a table named "Trends" where value of

the column "Hobbies" is "marketing" ?

- A. SELECT ALL FROM Friends WHERE Hobbies IS 'marketing';
- B. SELECT * FROM Friends WHERE Hobbies='marketing';
- C. SELECT * FROM Friends WHERE Hobbies = 'marketing' ;
- D. SELECT ALL FROM Friends WHERE Hobbies 'marketing' ;

Q8. Which statement is used to modify data in a table?

- A. CHANGE
- B. MODIFY
- C. UPDATE
- D. SAVE AS

Q9. Which SQL statement is used to delete data from a table?

- A. DELETE
- B. DROP
- C. TRUNCATE
- D. REMOVE

Q10. How do you select all the rows from a table named "Student" where the value of the column "FName" starts with "S"?

- A. SELECT * FROM Student WHERE FName LIKE 'S_';
- B. SELECT * FROM Student WHERE FName='S';
- C. SELECT * FROM Student WHERE FName LIKE 'S%';
- D. SELECT * WHERE Student WHERE FName='%S%';

Q11. Which keyword is used to return only different values in a column?

- A. DIFFERENT
- B. EXCLUSIVE
- C. DISTINCT
- D. UNIQUE

Q12. Which SQL keyword(s) is/are used to sort the rows in the output:

- A. SORTED ORDER
- B. SORT
- C. SORT BY
- D. ORDER BY

Q13. How would you return all the rows from a table named "Item" sorted in descending order on the column "IName"?

- A. SELECT * FROM Item SORT 'IName' DESC;
- B. SELECT * FROM Item ORDER BY IName DESC ;
- C. SELECT * FROM Item ORDER IName DESC ;
- D. SELECT * FROM Item SORT BY 'IName' DESC;

Q14. How can you insert a new row into the "Store" table?

- A. INSERT (1,'Abc Rice') INTO Store;
- B. INSERT VALUES (1,'Abc Rice') INTO Store ;
- C. NSERT INTO Store VALUES(1,'Abc Rice');
- D. ADD ROW Store values(1,'Abc Rice');

Q15. Which statement is appropriate to change the first name "Madhur" to "Mridul" in the "FName" column in the 'Student' table?

- A. UPDATE Student SET FName='Mridul' WHERE FName='Madhur' ;
- B. MODIFY Student SET FName='Madhur' INTO FName='Mridul' ;
- C. UPDATE Student SET FName='Madhur' INTO FName='Mridul' ;
- D. UPDATE Student SET FName='Madhur' WHERE FName='Mridul' ;

Q16. How do you delete the rows with marks below 33 in the 'Student' Table?

- A. DELETE FROM Student WHERE marks <=33;
- B. DELETE marks < 33 FROM Student ;
- C. DELETE ROW marks <33;
- D. DELETE FROM Student WHERE marks<33;

Q17. The OR operator displays a record if ANY of the conditions listed are true. The AND operator displays a record if ALL of the conditions listed are true:

- A. False
- B. True
- C. 0
- D. None of These

Q18. SUM, AVG, COUNT are examples of _____ functions.

- (a) Date
- (b) String
- (c) Multiple Row
- (d) Single Row

Q19. MySQL is a /an

- A. Relational Database
- B. Database
- C. RDBMS
- D. Table

Q20. USE <database name >command:

- A. is not used in MySQL
C. opens a table
- B. is given before quitting MySQL
D. opens a database
- Q21. A database:
- A. Contains tables
C. Is same as a table
- B. Is a part of a table
D. Removes data from a table
- Q22. ORDER BY clause is used to sort data
- A. in ascending order
C. both (a) and (b)
- B. in descending order
D. None of the above
- Q23. Wild card characters are used
- A. In LIKE clause
C. In BETWEEN clause
- B. In ORDER BY clause
D. In IN clause
- Q24. DDL is
- A. a part of SQL
B. a part of DML
C. a part of DCL
D. None of these
- Q25. LIKE clause is used
- A. For pattern matching
C. For inserting similar data in a table
- B. For table matching
D. For deleting data from a table
- Q26. Which of the following will give the same answer irrespective of the NULL values in the specified column:
- A. MIN()
B. MAX()
C. SUM()
D. None of the above
- Q27. An aggregate function:
- A. Takes a column name as its arguments
C. Both (a) and (b)
- B. May take an expression as its argument
D. None of (a) and (b)
- Q28. In the FROM clause of a SELECT statement
- A. Multiple Column Names are specified.
C. Multiple Column Names may be specified.
- B. Multiple table names are specified.
D. Multiple table names may be specified.
- Q29. JOIN in RDBMS refers to
- A. Combination of multiple columns
C. Combination of multiple tables
- B. Combination of multiple rows
D. Combination of multiple databases
- Q30. Equi-join is formed by equating
- A. Foreign key with Primary key
C. Primary key with Primary key
- B. Each row with all other rows
D. Two tables
- Q31. Referential integrity
- A. Must be maintained
C. Is automatically maintained by databases
- B. Cannot be maintained
D. Should not be maintained
- Q32. A Primary key column
- A. Can have NULL values
C. Both (a) and (b)
- B. Can have duplicate values
D. Neither (a) nor (b)
- Q33. Natural join is required
- A. Only one table
C. One attribute must be same
- B. Two Tables
D. (b) and (c)
- Q34. Count(*) method count
- A. NULL values only
B. ALL the values
- B. Empty Values
D. None of these
- Q35. Which multiple row method will give output except 0 for string data type?

- A. AVG() B. COUNT() C. MIN() D. SUM()

Q36. Which command change structure of table?

- A. ALTER TABLE B. INSERT INTO C. CHANGE TABLE D. UPDATE

Q37. Which clause will display NULL values in output?

- A. NULL B. IS NULL C. IS NOT NULL D. NULL IS

Q38. Which relational operator not used in Equi-Join?

- A. > B. < C. = D. Neither (a) nor (b)

Q39. To select all the attributes of the given relation

- A. ALL B. * C. DISTINCT D. None of these

Q40. To display list of Tables

- A. SHOW DATABASES B. DISPLAY TABLES C. SHOW TABLE D. SHOW TABLES

Answers: -

Q1	Q2	Q3	Q4	Q5
A	D	C	B	B
Q6	Q7	Q8	Q9	Q10
C	B	C	A	C
Q11	Q12	Q13	Q14	A15
C	D	B	C	A
Q16	Q17	Q18	Q19	Q20
D	B(TRUE)	C	C	D
Q21	Q22	Q23	Q24	Q25
A	C	A	A	A
Q26	Q27	Q28	Q29	Q30
C	A	B	C	A
Q31	Q32	Q33	Q34	Q35
C	D	D	B	C
Q36	Q37	Q38	Q39	Q40
A	B	D	B	D

INTERFACE OF PYTHON AND MYSQL CONNECTIVITY:

1. Which method of cursor class is used to fetch limited rows from the table?

- (A) cursor.fetchsize(SIZE) (B) cursor.fetchmany(SIZE)
(c) cursor.fetchall(SIZE) (D) cursor.fetchonly(SIZE)

2. Which method of cursor class is used to insert or update multiple rows using a single Query?

- (A) cursor.executeall(query,rows) (B) cursor.execute(query,rows)
(C) cursor.executemultiple(query,rows) (D) cursor.executemany(query,rows)

3. Which method of cursor class is used to get the number of rows affected after any of the Insert/update/delete database operation executed from Python?

- (A) cursor.rowcount (B) cursor.getaffectedcount
(C) cursor.rowscount (D) cursor.rcount

4. Which of the following is invalid method for fetching the records from database within Python?

- (A) fetchone() (B) fetchmany() (C) fetchall() (D) fetchmulti()

5. Which of the following method reflects the changes made in database permanently?

- (A) <connection>.done() (B) <connection>.final()

- (C) <connection>.reflect() (D) <connection>.commit()
 6. To get all the records from the result set, we may use _____.
 (A) cursor.fetch(SIZE) (B) cursor.fetchmany()
 (c) cursor.fetchall() (D) cursor.fetchone()

Answers:

Q1	Q2	Q3	Q4	Q5	Q6
B	D	A	D	D	C

7. Which command is use to install MySQL library in python?

Ans: pip install MySQL. Connector with path of python

8. Which method we use to establish the connection?

Ans: connect() method with connection object.

9. Which statement we use to access the MySQL module?

Ans: import mysql.connector

10. What are the difference between fetchone(),fetchmany(),fetchall()?

Ans: fetchall(): It will return all the records retrieved in tuple form.

fetchone(): It will return one record from the result set.

fetchmany(n): It will return number of records as per value of n and by-default only one record.

Q11. Which statement is used to select a database and make it current?

ANS: USE DATABASE NAME;

Q12. Write SQL statement which is used to view names of all tables contained in current database

ANS: SHOW TABLES;

Q13. Which keyword is used to eliminate redundant data?

ANS: DISTINCT

Q14. In INSERT INTO statement, while giving data values, how should text and date values be supplied?

ANS: String format

Q15. What is NULL? What happens when you perform arithmetic calculations on NULL values?

ANS: NULL is not a value but by default taken as value when we insert data or add new attribute in table and retrieve data. Result will show NULL.

Q16. Is there any difference in the output of the following statements? Justify your answer. Select * from Emp; **or** SELECT * FROM EMP;

ANS: There is no difference because My SQL is not case-sensitive language.

Q47. List two categories into which MySQL statements can be categorized. Give examples of 2 statements in each category.

ANS: Two categories DDL and DML. DDL – CREATE, ALTER, DROP
 DML- INSERT, UPDATE, DELETE

Q48. Write the minimum number of column(s) that must be specified while creating a table using CREATE TABLE statement.

ANS: MINIMUM One Column Required.

Q49. What happens if you give a CREATE TABLE statement to create a table named 'Item' and a table named 'Item' already exists?

ANS: It will display error table Item already exist.

Q50. Write any 4 things that are displayed when you display the structure of a table using DESCRIBE statement.

ANS: Four things are:- Field | Type | Null | Key | Default | Extra |

Q51. Harsh write statement it shows error: INSERT Emp(Empid,Salary) VALUES ('I201',25000,'MALE'); Where is mistake done by harsh help him to correct statement.

ANS: INSERT INTO Emp(Empid, salary) VALUES('I201',25000);

Q52. What is the difference in the output of SELECT statement if we write the keyword ALL in place of DISTINCT?

ANS: By using ALL it will display duplicate data also.

Q53. What is the purpose of a Column Alias?

ANS: Column Alias will change name of attributes in output which we given with AS clause

Q54. Write the purpose of the following SELECT statement?

SELECT Itemcode, IName AS "Item Title" FROM Item;

ANS: SELECT statement display in output IName as Item Title.

Q55. Which statement is used to modify data in a table?

ANS: UPDATE TABLE_NAME SET COLUMN_NAME=<New_Value/ Updated_Value>;

Q56. Which statement is used to remove a column from a table?

ANS: ALTER TABLE with DROP clause.

Q57. What is the purpose of "ORDER BY" clause?

ANS: ORDER BY clause arranging/sorting data in ascending or descending order.

Q58. Mr. Rohan has created a table 'student' with rollno., name, class and section. Now he is confused to set the primary key. So identify the primary key column.

ANS: ROLLNO column will be PRIMARY key because it is unique.

Q59. Ms. Ravina is using a table 'customer' with custno, name, address and phonenumber. She needs to display name of the customers, whose name start with letter 'S'. She wrote the following command, which did not give the desired result.

Select * from customer where name="S%";

Help Ms. Ravina to run the query by removing the errors and write the correct query.

ANS: SELECT NAME FROM CUSTOMER WHERE NAME LIKE 'S%';

Q60. Write SQL query to add a column totalprice with data type numeric and size 10, 2 in a table product.

ANS: ALTER TABLE PRODUCT ADD TOTALPRICE FLOAT(10,2);

Q61. The name column of a table 'student' is given below.

Based on the information, find the output of the following

queries: A. Select name from student where name like "K%";

B. Select name from student where name like "%i%";

Ans:

NAME
Kannika Goal
Kunal SharmA

NAME
Rohan Saini
Deepak Sing
Kannika Goal

RESULT OF B

NAME
Anu Sharma
Rohan Saini
Deepak Sing
Kannika Goal
Kunal SharmA

TABLE:STUDENT

RESULT OF A

Q62. A customer table is created with cno, cname, and address columns. Evaluate the following statement whether it is correct or not? Delete cname from customer.

ANS: ALTER TABLE CUSTOMER DROP CNAME;

Q63. Shopkeeper needs to change the Cname of 'SURESH' of one of his customers in table 'customer'. whose cno is 1. Which command should he use for the same?

ANS: UPDATE CUSTOMER
SET CNAME='SURESH'
WHERE CNO=1;

Q64. Sonal needs to display name of teachers, who have "o" as the third character in their name.

She wrote the following query. Select name From teacher Where name = "\$\$o?";
But the query is not producing the result. Identify the problems.

ANS: SELECT NAME FROM TEACHER
WHERE NAME LIKE '_ _ o%';

Q65. Pooja created a table 'bank' in SQL. Later on, she found that there should have been another column in the table. Which command is used to add column to the table?

ANS: ALTER TABLE BANK
ADD COLUMN NAME DATA TYPE(SIZE);

Q66. Deepak wants to remove all rows from the table Bank. But he needs to maintain the structure of the table. Which command is used to implement the same?

ANS: DELETE * FROM BANK;

Q67. Which command is use to delete a table?

ANS: DROP TABLE command

Q68. What is the default value of order by command?

ANS: ASCENDING

Q69. Create the following table item.

ANS: CREATE TABLE ITEM

(Itemno Number(3) Not Null Primary Key,
Iname varchar(15),
Price float(10,2),
Quantity int
);

TABLE: ITEM

Column name	Data type	SIZE	Constraint
Itemno	Number	3	Primary Key
Iname	Varchar	15	
Price	Float	10,2	
Quantity	Int	3	

Q70. Insert the following information:

Table: Item

ANS: INSERT INTO Item

VALUES(101,'Soap',50,100),
(102,'Powder',100,50),
(103,'Face Cream',150,25),
(104,'Pen',50,200);

Itemno	Iname	Price	Quantity
101	Soap	50	100
102	Powder	100	50
103	Face cream	150	25
104	Pen	50	200
105	Soap box	20	100

Q71. Write queries based upon item table given in q. no 70.

a) Display all items information.

ANS: SELECT * FROM ITEM;

b) Display item name and price value.

ANS: SELECT INAME,PRICE FROM ITEM;

c) Display soap information.

ANS: SELECT * FROM ITEM WHERE INAME='SOAP';

d) Display the item information whose name starts with letter 's'.

ANS: SELECT * FROM ITEM WHERE INAME LIKE 'S%';

e) Display a report with item number, item name, total price.(total price =price * quantity).

ANS: SELECT ITEMNO, INAME, PRICE AS 'TOTALPRICE (PRICE*QTY)' FROM ITEM;

f) Display item table information in ascending order based upon item name.

ANS: SELECT * FROM ITEM ORDER BY INAME(ASC);

g) Display item name and price in descending order based upon price.

ANS: SELECT INAME,PRICE FROM ITEM ORDER BY PRICE DESC.

h) Display item name, whose price is in between 50 to 100.

ANS: SELECT INAME FROM ITEM WHERE PRICE BETWEEN 50 AND 100;

i) Add new column totalprice with number (10, 2).

ANS: ALTER TABLE ITEM ADD TOTALPRICE FLOAT(10,2);

j) Increase price value by 100.

ANS: UPDATE PRICE SET PRICE=PRICE+100;

k) Remove powder information.

ANS: DELETE FROM ITEM WHERE INAME='POWDER';

l) Remove totalprice column.

ANS: ALTER TABLE ITEM DROP TOATLPRICE;

m) Remove whole item structure.

ANS: DROP TABLE ITEM;

Q72. Write outputs based upon item table given in q. no 71.

SELECT SUM(PRICE),MIN(PRICE),MAX(PRICE),COUNT(PRICE),AVG(PRICE),
COUNT(DISTINCT(PRICE)) FROM ITEM;

ANS:

```
+-----+-----+-----+-----+-----+-----+
|SUM(PRICE)|MIN(PRICE)|MAX(PRICE)|COUNT(PRICE)|AVG(PRICE)|COUNT(DISTINCT
(PRICE)
+-----+-----+-----+-----+-----+-----+
| 370.00 | 20.00 | 150.00 | 5 | 74.000000 | 4 |
+-----+-----+-----+-----+-----+-----+
```

Q73. Consider a database LOANS with the following table: LOAN_ACC

```
+-----+-----+-----+-----+-----+-----+
| accno | name      | amount | instal | rate  | start_date |
+-----+-----+-----+-----+-----+-----+
| 1 | R.K.GUPTA | 300000 | 36 | 12.00 | 2009-07-19 |
| 2 | S.P.SHARMA | 500000 | 48 | 10.00 | 2008-03-22 |
| 3 | K.P JAIN   | 300000 | 36 | NULL  | 2007-03-08 |
| 4 | M.P. YADAV | 800000 | 60 | 10.00 | 2008-12-06 |
| 5 | S.P.SINHA | 200000 | 36 | 12.50 | 2010-01-03 |
| 6 | P.SHARMA  | 700000 | 60 | 12.50 | 2008-06-05 |
| 7 | K.S.DHALL | 500000 | 46 | NULL  | 2008-03-05 |
+-----+-----+-----+-----+-----+-----+
```

Write SQL commands for the following questions.

1. Create the database LOANS.

ANS: CREATE DATABASE LOAN;

2. Use the database LOANS.

ANS: USE LOAN;

3. Create the table Loan_Accounts and insert tuples in it.

ANS: CREATE TABLE LOAN_ACC (ACCNO INT PRIMARY KEY, NAME VARCHAR(40), AMOUNT INT, INSTAL INT, RATE FLOAT(5,2), START_DATE DATE);
INSERT INTO LOAN_ACC VALUES(1,'R.K.GUPTA',300000,36,12.0,'2009-07-19'),
(2,'S.P.SHARMA',500000,48,10.0,'2008-03-22');

NOTE:- SIMILARLY WE INSERT TUPLES.

4. Display the details of all the loans.

ANS: SELECT* FROM LOAN_ACC;

5. Display the AccNo, Cust_Name, and Loan_Amount of all the loans.

ANS: SELECT ACCNO,NAME,AMOUNT FROM LOAN_ACC;

6. Display the details of all the loans with less than 40 instalments.

ANS: SELECT * FROM LOAN_ACC WHERE INSTAL<40;

7. Display the AccNo and Loan_Amount of all the loans started before 01-04-2009.

ANS: SELECT ACCNO,AMOUNT FROM LOAN ACC WHERE STRAT_DATE<'2009-04-01';

8. Display the Int_Rate of all the loans started after 01-04-2009.

ANS: SELECT RATE FROM LOAN_ACC WHERE START_DATE>'2009-04-01';

9. Display the details of all the loans whose rate of interest is NULL.

ANS: SELECT * FROM LOAN_ACC WHERE RATE IS NULL;

10. Display the details of all the loans whose rate of interest is not NULL.

ANS: SELECT * FROM LOAN_ACC WHERE RATE IS NOT NULL;

11. Display the amounts of various loans from the table Loan_Accounts. A loan amount should appear only once.

ANS: SELECT DISTINCT AMOUNT FROM LOAN_ACC;

12. Display the number of instalments of various loans from the table Loan_Accounts. an instalment should appear only once.

ANS: SELECT DISTINCT(INSTAL) FROM LOAN_ACC;

13. Display the details of all the loans started after 31-12-2008 for which the number of instalments are more than 36.

ANS: SELECT * FROM LOAN_ACC WHERE START_DATE>'2008-12-31' AND INSTAL>36;

14. Display the Cust_Name and Loan_Amount for all the loans which do not have number of instalments 36.

ANS: SELECT NAME,AMOUNT FROM LOAN_ACC WHERE INSTALL !=36;

15. Display the Cust_Name and Loan_Amount for all the loans for which the loan amount is less than 500000 or int_rate is more than 12.

ANS: SELECT NAME, AMOUNT FROM LOAN_ACC WHERE AMOUNT<500000 OR RATE>12;

16. Display the details of all the loans which started in the year 2009.

ANS: SELECT * FROM LOAN_ACC WHERE START_DATE>='2009-01-01'
AND START_DATE<='2009-12-31'

17. Display the details of all the loans whose Loan_Amount is in the range 400000 to

500000.

ANS: SELECT * FROM LOAN_ACC WHERE AMOUNT >=400000 AND AMOUNT<=500000;

18. Display the details of all the loans whose rate of interest is in the range 11% to 12%.

ANS: SELECT * FROM LOAN_ACC WHERE RATE>= 11 AND RATE<=12;

19. Display the Cust_Name and Loan_Amount for all the loans for which the number of instalments are 24, 36, or 48. (Using IN operator)

ANS: SELECT NAME,AMOUNT FROM LOAN_ACC WHERE INSTALL IN(24,36,48);

20. Display details of all loans whose Loan_Amount is in the range 400000 to 500000. (Using BETWEEN operator)

ANS: SELECT * FROM LOAN_ACC WHERE AMOUNT BETWEEN 400000 AND 500000;

21. Display the details of all the loans whose rate of interest is in the range 11% to 12%. (Using BETWEEN operator)

ANS: SELECT * FROM LOAN_ACC WHERE RATE BETWEEN 11 AND 12;

22. Display the AccNo, Cust_Name, and Loan_Amount for all the loans for which the Cust_Name ends with 'Sharma'.

ANS: SELECT ACCNO, NAME, AMOUNT FROM LOAN_ACC WHERE NAME LIKE '%SHARMA';

23. Display the AccNo, Cust_Name, and Loan_Amount for all the loans for which the Cust_Name ends with 'a'.

ANS: SELECT ACCNO,NAME,AMOUNT FROM LOAN_ACC WHERE NAME LIKE '%A';

24. Display the AccNo, Cust_Name, and Loan_Amount for all the loans for which the Cust_Name contains 'a'

ANS: SELECT ACCNO,NAME,AMOUNT FROM LOAN_ACC WHERE NAME LIKE '%A%';

25. Display the AccNo, Cust_Name, and Loan_Amount for all the loans for which the Cust_Name does not contain 'P'.

ANS: SELECT ACCNO,NAME,AMOUNT FROM LOAN_ACC WHERE NAME NOT LIKE '%P%';

26. Display the AccNo, Cust_Name, and Loan_Amount for all the loans for which the Cust_Name contains 'a' as the second last character.

ANS: SELECT ACCNO,NAME,AMOUNT FROM LOAN_ACC WHERE NAME LIKE '_A%';

27. Display the details of all the loans in the ascending order of their Loan_Amount.

ANS: SELECT * FROM LOAN_ACC ORDER BY AMOUNT ASC;

28. Display the details of all the loans in the descending order of their Start_Date.

ANS: SELECT * FROM LOAN_ACC ORDER BY START_DATE DESC;

29. Display the details of all the loans in the ascending order of their Loan_Amount and within Loan_Amount in the descending order of their Start_Date.

ANS: SELECT * FROM LOAN_ACC ORDER BY AMOUNT ASC , START_DATE DESC;

30. Put the interest rate 11.50% for all the loans for which interest rate is NULL.

ANS: UPDATE LOAN_ACC SET RATE=11.50 WHERE RATE IS NULL;

31. Increase the interest rate by 0.5% for all the loans for which the loan amount is more than 400000.

ANS: UPDATE LOAN_ACC SET RATE=RATE+0.50 WHERE AMOUNT>400000;

32. Delete the records of all the loans whose start date is before 2007.

ANS: DELETE * FROM LOAN_ACC WHERE START_DATE<'2007-01-01';

33. Delete the records of all the loans of 'K.P. Jain'

ANS: DELETE * FROM LOAN_ACC WHERE NAME='K.P JAIN';

34. Add another column Category of type CHAR(1) in the Loan table.

ANS: ALTER TABLE LOAN_ACC ADD CAT CHAR(1);

35. Write SQL statements to do the following:

a) Display the last names and first names of all employees.

ANS: SELECT LASTNAME, FIRSTNAME FROM EMP;

b) Display the Department names of all employees, without duplicates.

ANS: SELECT DISTINCT(DEPARTMENT) FROM EMP;

c) Display all the details of employees with last name as "Lakshmi".

ANS: SELECT * FROM EMP WHERE LASTNAME='LAKSHMI';

d) Display all the details of employees whose last name is ""Rajlani" or "Sharma".

ANS: SELECT * FROM EMP WHERE LASTNAME='RAJLANI' OR LASTNAME='SHARMA';

e) Display the codes and first names of all employees of 'Accounts' department.

ANS: SELECT ECODE,FIRSTNAME FROM EMP WHERE DEPARTMENT='ACCOUNTS';

f) Display department names of departments with budget above 18000.

ANS: SELECT DEPNAME FROM DEPT WHERE BUDGET>18000;

g) Display all the details of employees whose First name begins with "S".

ANS: SELECT * FROM EMP WHERE FIRSTNAME LIKE 'S%';

h) Display department details(from Department table) in descending order of Budget amount.

ANS: SELECT * FROM DEPT ORDER BY BUDGET DESC;

i) Change the Department name "Sales" to "Marketing" everywhere in the table "Employee" and "Department"

ANS: UPDATE

j) Add a new row with appropriate data values in Department table.

ANS: INSERT INTO DEPT VALUES(105, 'MARKETING',40000);

k) Display LastName,DepName and budget of employee matches with their code.

ANS: SELECT LASTNAME,DEPNAME,BUDGET FROM EMP,DEPT
WHERE EMP.ECODE=DEPT. DEPCODE;

36. In a database create the following tables with suitable constraints :

TABLE: TEACHER

TID	TNAME	DEPT	CITY
1	RAVI	MATHS	DELHI
2	MEHRA	COMP	MUMBAI
3	PAWAN	SCIENCE	JAIPUR

TABLE: STU

ADM	SNAME	MARKS	CITY
1	MAHESH	99	MUMBAI
2	AARUJ	95	DELHI

A) Display name and department and admission no from teacher and student as per Matches of their id.

ANS: SELECT TNAME,DEPT,ADM FROM TEACHER,STU
WHERE TEACHER.TID=STU.ADM;

B) Display the no. of city whose tid is greater than 2.

ANS: SELECT COUNT(TID) FROM TEACHER WHERE TID>2;

C) Display the average of marks of students.

ANS: SELECT AVG(MARKS) FROM STU;

OUTPUT OF QUERIES

D) SELECT * FROM TEACHER NATURAL JOIN STU;

ANS: +-----+-----+-----+-----+-----+-----+-----+

CITY	TID	TNAME	DEPT	ADM	SNAME	MARKS
DELHI	1	RAVI	MATHS	2	AARUJ	95.00
MUMBAI	2	MEHRA	COMP	1	MAHESH	99.00

THEORY QUESTIONS:-

1	Define DDL & DML commands of SQL with example.										
ANS	<p>DDL: - Data Definition Language (DDL) provides commands for defining relation schemas, deleting relations, creating indexes, and modifying relation schemas. For example: CREATE, ALTER, DROP etc...</p> <p>DML: - Data Manipulation Language (DML) includes commands for manipulating tuples in databases. For example: Insert, Delete, Update commands etc...</p>										
2	Differentiate between char and varchar datatype in MYSQL.										
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3	Differentiate ALTER TABLE and UPDATE command?										
	<table border="1"> <thead> <tr> <th>ALTER TABLE</th> <th>UPDATE</th> </tr> </thead> <tbody> <tr> <td>Used to change/modify the structure of the table</td> <td>Used to change/modify the data in the table</td> </tr> <tr> <td>It is a DDL command</td> <td>It is a DML command</td> </tr> <tr> <td>Being a DDL command it can not be rolled back or undone</td> <td>Being a DML command it can be rolled back or undone</td> </tr> </tbody> </table>	ALTER TABLE	UPDATE	Used to change/modify the structure of the table	Used to change/modify the data in the table	It is a DDL command	It is a DML command	Being a DDL command it can not be rolled back or undone	Being a DML command it can be rolled back or undone		
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Being a DDL command it can not be rolled back or undone	Being a DML command it can be rolled back or undone										
4	What is the purpose of IS NULL and IS NOT NULL operators?										
	<p>IS NULL and IS NOT NULL operators are used for filtering tuples from the table having or not having NULL values in a specific attribute. E.g.</p> <p>SELECT * FROM STUDENT WHERE DOB IS NULL;</p> <p>SELECT * FROM STUDENT WHERE CLASS IS NOT NULL;</p>										
5.	What is the use of LIKE operator in SQL?										
	Like operator is used for matching patterns of character values on specific attributes and filter out the tuples on the basis of the given patterns. It uses two wildcard characters % and _ (Underscore) for specifying patterns.										
6.	What is the difference between where clause and having clause?										

WHERE CLAUSE	HAVING CLAUSE
It is used to apply conditions on individual rows.	It is used to apply conditions on a group of rows.
Example: Select * from customer where salary>2000;	Example: Select city,sum(salary) from customer group by city having city="jaipur";

7. Explain Cartesian product/Cross join in SQL?

In a **CARTESIAN JOIN** there is a join for each row of one table to every row of another table. This usually happens when the matching column or **WHERE** condition is not specified.

Example

Table1	Table2															
<table border="1"> <thead> <tr> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>XYZ</td> </tr> <tr> <td>2</td> <td>PQR</td> </tr> </tbody> </table>	A	B	1	XYZ	2	PQR	<table border="1"> <thead> <tr> <th>A</th> <th>C</th> <th>D</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>C1</td> <td>10</td> </tr> <tr> <td>2</td> <td>C2</td> <td>20</td> </tr> </tbody> </table>	A	C	D	1	C1	10	2	C2	20
A	B															
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Cartesian product of Table 1 and Table 2 will be: `SELECT * FROM Table1, Table2;`

A	B	A	C	D
1	XYZ	1	C1	10
1	XYZ	2	C2	20
2	PQR	1	C1	10
2	PQR	2	C2	20

8.What is Natural Join? Explain with example?

A natural join is a type of join operation that creates an implicit join by combining tables based on columns with the same name and data type. Natural join automatically filters out records based on equality on common attribute(s) and eliminates duplicated common attribute(s) from the resultant table.

Example

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Cartesian product of Table 1 and Table 2 will be:
`SELECT * FROM Table1 NATURAL JOIN Table2;`

A	B	C	D
1	XYZ	C1	10
2	PQR	C2	20

KENDRIYA VIDYALAYA SANGATHAN, JAIPUR REGION

Class :- XII Session 2022-23

Computer Science (083)

Practice Paper- 1

Maximum marks: - 70

Time: - 3 Hr

General Instructions: -

- This question paper contains 5 sections. Section A to E
- All questions are compulsory
- Section A has 18 questions of 1 mark each.
- Section B has 7 questions very short answer type of 2 marks each
- Section C has 5 questions short answer type of 2 marks each
- Section D has 3 questions long answer type of 2 marks each
- Section E has 2 questions of 4 marks each. One internal choice is given in Q35 against part C only
- All programming questions are based on Python Programming language.

SECTION A		
Q.1	State Ture of False True is not False in [True, False]	1
Q.2	Which is unordered sequence (a) tuple (b) list (c) dictionary (d) String	1
Q.3	What will be the content of dictionary d after executing the following code d={1:100,2:200} t=(1,2,3) d.fromkeys(t)	1
Q.4	What will be the output of the following code 3>2>1*5 (a) Ture (b) False (c) Error (d) None of all	1
Q.5	Predict the result of the following code "@".join("abc-gmail.com".split("-"))	1
Q.6	Which open method of file handling does not require file to be close explicitly.	1
Q.7	Which pair of SQL Statement is not from the same category of SQL command (a) create, alter (b) insert, delete (c) delete, drop (d) update, delete	1
Q.8	Choose valid statement (a) insert command is part of DDL (b) insert command insert a row at beginning (c) insert command can insert a row any where (d) insert command insert many rows	1
Q.9	Mr khan has written following python code. Choose the one which will not execute (a) t=(10,20)+(30,40) (b) t=(10,20)+(30) (c) t=10+(10) (d) t=(10,20)+(30,)	1

Q.10	A key of a table is not primary key but can be selected as primary key. Choose the correct answer for the above given statement (a) Secondary key (b) Alter table (c) Candidate key (d) Foreign key	1
Q.11	Correct syntax to open a binary file in read mode is (a) F=open("abc.dat","b","r") (b) F=open("abc.dat","br") (c) F=open("abc.dat","rb") (d) F=open("abc.dat","r","b")	1
Q.12	The correct definition of column 'alias' is (a) A permanent new name of column (b) A new column of a table (c) A view of existing column with different name (d) A column which is recently deleted	1
Q.13	Fill in the blank The service for remote login is called _____ (a) Telnet (b) Web browser (c) Firewall (d) Cookies	1
Q.14	Correct statement for a^b is (a) math.pow(a,b) (b) a**b (c) both a and b are correct (d) math.sqrt(a,b)	1
Q.15	To view the list of tables of a database, the correct command is ____ (a) list tables (b) show tables (c) display tables (d) view tables	1
Q.16	Using python mysql connectivity the correct code to display all the available databases of Mysql with the help of a cursor mcur is (a) mcur.execute("show database") (b) mcur.execute("desc database") (c) mcur.execute("show databases") (d) mcur.execute("desc databases")	1
	Question 17 and 18 are ASSERTION AND REASONING based. Mark the correct choice as (a) A and R are True and R is correct explanation of A (b) A and R are True and R is not correct explanation of A (c) A is True but R is False (d) A is False but R is True	
Q.17	Assertion(A): if an existing file whose size was 50 Byte is opened in write mode and after writing another 50 Byte into file it is closed. The file size is 100 Byte after closing. Reason(R) : File size will remain 50 Byte as it was not opened in append mode so old content will be lost.	1
Q.18	Assertion(A): A function can take no argument or any number of argument and writing of return keyword is not compulsory Reason(R) : If we do not write return key word the function will return None value.	1

SECTION B															
Q.19	The following code has some error. Rewrite the code underling the correction made. def funpara(a=20,b=10,c) if a>b: print(“first is big”) else: print(“second is big”) Return(“Third number is missing”)	2													
Q.20	Write one advantage and one disadvantage of circuit switching OR Which language is the most suitable language to create static web pages? Does your suggested language has pre defined tags.	2													
Q.21	Write correct code to produce output “retupmoc” if a variable s1 contains “computer” (a) s1=“computer” print(s1[____]) (b) Write the correct output of following code d={1:100,2:200} for x,y in d: print(x,d[x],end=“”)	1	1												
Q.22	How many candidate key and primary key a table can have? Can we declared combination of fields as a primary key?	2													
Q.23	(a) Which protocol is used to upload files on web server? (b) Expand the term TCP/IP	2													
Q.24	Choose the best option for the possible output of the following code import random L1=[random.randint(0,10) for x in range(3)] print(L1) (a) [0,0,7] (b) [9,1,7] (c) [10,10,10] (d) All are possible OR import random num1=int(random.random()+0.5) What will be the minimum and maximum possible values of variable num1	2													
Q.25	Mrs sunita wrote a query in SQL for student table but she is not getting desired result select * from student where fee = NULL; Rewrite the above query so she well gets desired result OR What is the difference between delete and drop command?	2													
SECTION C															
Q.26	(a) What is the difference between not-equi join and equi join. (b) Consider the TEACHER table given below	1+2													
	<table border="1"> <thead> <tr> <th>TEACHER</th> <th>SUBJECT</th> <th>GENDER</th> <th>AGE</th> </tr> </thead> <tbody> <tr> <td>MANOJ</td> <td>SCIENCE</td> <td>MALE</td> <td>38</td> </tr> <tr> <td>NIKUNJ</td> <td>MATHS</td> <td>MALE</td> <td>40</td> </tr> </tbody> </table>	TEACHER	SUBJECT	GENDER	AGE	MANOJ	SCIENCE	MALE	38	NIKUNJ	MATHS	MALE	40		
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Q.27	<p>Write a function readstar() that reads a text file STORY.TXT and display line numbers that contains * anywhere. For example, the file contains</p> <p>The multiplication symbol * has many meaning</p> <p>The * can also be used as pointer</p> <p>The addition symbol + also has many meaning</p> <p>The output of the readstar() should be</p> <p>Line no 1 has star</p> <p>Line no 2 has star</p> <p style="text-align: center;">OR</p> <p>Write a function word5count() that count number of words whose length is more than 5 characters in above given STORY.TXT file.</p>	3																																																
Q.28	<p>(a) Consider the doctor and patient table and write the output of (i) to (iv)</p> <p>Doctor</p> <table border="1"> <thead> <tr> <th>docid</th> <th>Dname</th> <th>Specialization</th> <th>Outdoor</th> </tr> </thead> <tbody> <tr> <td>D1</td> <td>MANISH</td> <td>PHYSICIAN</td> <td>MONDAY</td> </tr> <tr> <td>D2</td> <td>PARESH</td> <td>EYE</td> <td>FRIDAY</td> </tr> <tr> <td>D3</td> <td>KUMAR</td> <td>ENT</td> <td>SATURDAY</td> </tr> <tr> <td>D4</td> <td>AKASH</td> <td>ENT</td> <td>TUESDAY</td> </tr> </tbody> </table> <p>Patient</p> <table border="1"> <thead> <tr> <th>Pid</th> <th>Pname</th> <th>did</th> <th>Date_visit</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>Lal singh</td> <td>D2</td> <td>2022-04-25</td> </tr> <tr> <td>P2</td> <td>Arjun</td> <td>D1</td> <td>2022-05-05</td> </tr> <tr> <td>P3</td> <td>Narender</td> <td>D4</td> <td>2022-03-13</td> </tr> <tr> <td>P4</td> <td>Mehul</td> <td>D3</td> <td>2022-07-20</td> </tr> <tr> <td>P5</td> <td>Naveen</td> <td>D2</td> <td>2022-05-18</td> </tr> <tr> <td>P6</td> <td>Amit</td> <td>D1</td> <td>2022-01-22</td> </tr> </tbody> </table> <p>(I) select count(*) from patient where date_visit like '%2_';</p> <p>(II) select count(*) from doctor group by specialization;</p> <p>(III) select a.dname, b.pname from doctor a, patient b where a.docid=b.did;</p> <p>(IV) select dname from doctor,patient where docid=did and pname='Arjun';</p> <p>(c) With reference to RDBMS define attribute.</p>	docid	Dname	Specialization	Outdoor	D1	MANISH	PHYSICIAN	MONDAY	D2	PARESH	EYE	FRIDAY	D3	KUMAR	ENT	SATURDAY	D4	AKASH	ENT	TUESDAY	Pid	Pname	did	Date_visit	P1	Lal singh	D2	2022-04-25	P2	Arjun	D1	2022-05-05	P3	Narender	D4	2022-03-13	P4	Mehul	D3	2022-07-20	P5	Naveen	D2	2022-05-18	P6	Amit	D1	2022-01-22	3
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Q.29	Write a function exchange() that accept two list as parameter. The two	3																																																

	<p>list contains integer values. The function should return a single list that stores all the values of both list in sorted form. For example</p> <p style="margin-left: 40px;">L1=[4,20,9,15] L2= [7,0,70]</p> <p>The returned list should be [0,4,7,9,15,20,70]</p>									
Q.30	<p>Two list Lname and Lage contains name of person and age of person respectively. A list named Lnameage is empty. Write functions as details given below</p> <p>(i) Push_na() :- it will push the tuple containing pair of name and age from Lname and Lage whose age is above 50</p> <p>(ii) Pop_na() :- it will remove the last pair of name and age and also print name and age of removed person. It should also print "underflow" if there is nothing to remove</p> <p>For example the two lists has following data</p> <p style="margin-left: 40px;">Lname=['narender', 'jaya', 'raju', 'ramesh', 'amit', 'Piyush'] Lage=[45,23,59,34,51,43]</p> <p>After Push_na() the contains of Lnameage stack is</p> <p style="margin-left: 40px;">[('raju',59),('amit',51)]</p> <p>The output of first execution of pop_na() is</p> <p style="margin-left: 40px;">The name removed is amit The age of person is 51</p> <p style="text-align: center;">OR</p> <p>A dictionary stu contains rollno and marks of students. Two empty list stack_roll and stack_mark will be used as stack. Two function push_stu() and pop_stu() is defined and perform following operation</p> <p>(a) Push_stu() :- It reads dictionary stu and add keys into stack_roll and values into stack_marks for all students who secured more than 60 marks.</p> <p>(b) Pop_stu() :- it removes last rollno and marks from both list and print "underflow" if there is nothing to remove</p> <p>For example</p> <p style="margin-left: 40px;">stu={1:56,2:45,3:78,4:65,5:35,6:90}</p> <p>values of stack_roll and stack_mark after push_stu()</p> <p style="margin-left: 40px;">[3,4,6] and {78,65,90}</p>	3								
SECTION D										
Q.31	<p>The BPL corporation has 4 offices(Admin office, account office, marketing office and training office) situated at different locations of a metro city. Company is planning to connect all its offices through network. It wants to control all the office from admin office and all kind of work done in its office has been computerized. Now it wants to establish network among all its offices. Distance between its offices and number of computers in each office is given. You have to suggest best option for the following issues.</p> <p style="margin-left: 40px;">Distance between each offices</p> <table border="1" style="margin-left: 80px; margin-right: 80px;"> <tr> <td>Admin to account</td> <td>40 km</td> </tr> <tr> <td>Admin to marketing</td> <td>20 km</td> </tr> </table> <p style="margin-left: 40px;">No of computers in</p> <table border="1" style="margin-left: 80px; margin-right: 80px;"> <tr> <td>Admin</td> <td>120</td> </tr> <tr> <td>Account</td> <td>20</td> </tr> </table>	Admin to account	40 km	Admin to marketing	20 km	Admin	120	Account	20	
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marketing	30														
	<p>(i) Which device should be used in each office to connect each computer of the office</p> <p>(ii) To protect all incoming and outgoing data from hackers which hardware or software should be used.</p> <p>(iii) You are to suggest a plan to protect all individual computers from Phishing web sites, virus, trojan and worm attack.</p> <p>(iv) Suggest the best cable layout to connect all the computers of the company</p> <p>(v) Suggest where SERVER should be installed.</p>		1 1 1 1 1												
Q.32	<p>(a) Predict the output of the following code</p> <pre>email="Way2sma@gmail.com" for x in email.split("@"): if 'a' in x: print(x[0:3]) if x in ".": print(x[0:5])</pre> <p>(b)</p> <p>A mysql table class contains following columns</p> <ul style="list-style-type: none"> -Roll no -Name -Marks <p>The mysql database has following details</p> <pre>User='python' Password='test' database=student</pre> <p>The code given below calculate the sum of marks of all student. Fill in the blanks</p> <pre>import mysql.connector con=_____.connect(host='localhost', user='python', password='test', database='student') # statement 1 cur1=con.cursor() cur1._____("select * from class") # statement 2 total=0 for x in _____: # statement 3 total=total+int(x[2]) print("total marks of all students :- ", total) cur1.close()</pre> <p style="text-align: center;">OR</p> <p>(a) Predict the output of the following code</p> <pre>Name="Jitesh kumar" def test(a,b,c=10):</pre>		2+3												

	<pre> if c==10: return len(Name) if a==b: return a+b+c if a>b: return a+b print(test(2,3)) a=20 b=10 a=test(a,b,100) print(a) b=test(a,30,5) print(b) </pre> <p>(b) A mysql table shop contains following columns</p> <ul style="list-style-type: none"> - ProductId -PName -PPrice -Pquantity <p>The mysql database has following details</p> <p>User =root Password=base database=business</p> <p>The code given below calculate the sum of marks of all student. Fill in the blanks</p> <pre> import _____ #statement 1 con=mysql.connector.connect(host='localhost', user='root', password='base', database='business') cur1=con.cursor() price=int(input("enter price of product:- ")) product="colgate" sqlquery="update shop set price={ } where product={}.format(_____)" #statement 2 ur1.execute(_____) #statement 3 cur1.close() </pre>	
Q.33	<p>A csv file " result.csv" contains record of student in following order [rollno, name, sub1,sub2,sub3,total]</p> <p>Initially student total field is empty string as example data is given below</p> <pre> ['1', 'amit', '40', '34', '90', ''] ['2', 'bipin', '78', '34', '90', ''] ['3', 'camal', '40', '45', '9', ''] </pre> <p>A another file "final.csv" is created which reads records of "result.csv" and copy all records after calculating total of marks into final.csv. The contents of final.csv should be</p> <pre> ['1', 'amit', '40', '34', '90', '164'] ['2', 'bipin', '78', '34', '90', '202'] ['3', 'camal', '40', '45', '9', '94'] </pre> <p>(a) Define a function createcsv() that will create the result.csv file with the sample data given above</p> <p>(b) Define a function copycsv() that reads the result.csv and copy the same data after calculating total field into final.csv file.</p>	5

	OR	
	<p>(a) Define a function countresult() that count the total no of record in "result.csv" file as described above</p> <p>(b) Define a function finalstu() that reads the result.csv file as given above and copy all the records into result.csv file except rollno 2</p> <p>For example if result.cvs file contains</p> <pre>['1', 'amit', '40', '34', '90', ''] ['2', 'bipin', '78', '34', '90', ''] ['3', 'camal', '40', '45', '9', '']</pre> <p>The final.csv file will contain</p> <pre>['1', 'amit', '40', '34', '90', ''] ['3', 'camal', '40', '45', '9', '']</pre>	

SECTION E		
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Q.34	<p>A table GAME has following structure and data</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Gname</th> <th>NoPlayer</th> <th>Captain</th> <th>Won</th> <th>lost</th> <th>draw</th> <th>Location</th> </tr> </thead> <tbody> <tr> <td>Cricket</td> <td>11</td> <td>Dhoni</td> <td>25</td> <td>5</td> <td>10</td> <td>India</td> </tr> <tr> <td>Cricket</td> <td>11</td> <td>Dhoni</td> <td>10</td> <td>5</td> <td>3</td> <td>Outside</td> </tr> <tr> <td>TT</td> <td>2</td> <td>Vikash</td> <td>17</td> <td>20</td> <td>5</td> <td>India</td> </tr> <tr> <td>TT</td> <td>2</td> <td>Vikash</td> <td>4</td> <td>20</td> <td>7</td> <td>Outside</td> </tr> <tr> <td>Kabaddi</td> <td>5</td> <td>Suwan</td> <td>30</td> <td>3</td> <td>1</td> <td>India</td> </tr> <tr> <td>Kabaddi</td> <td>5</td> <td>Suwan</td> <td>10</td> <td>1</td> <td>0</td> <td>Outside</td> </tr> </tbody> </table> <p>I. Identify candidate key of the Game table, if any. Justify your answer</p> <p>II. How many rows will be in output if a query is executed using DISTINCT clause in field Captain.</p> <p>III.</p> <p>(i) Which command will display the structure of GAME table</p> <p>(ii) Write a sql query that will delete the record of captain Dhoni in outside location</p> <p style="text-align: center;">OR</p> <p>(i) Write sql query to remove the column draw</p> <p>(ii) Write sql query that change number of player for the game kabaddi to 6</p>	Gname	NoPlayer	Captain	Won	lost	draw	Location	Cricket	11	Dhoni	25	5	10	India	Cricket	11	Dhoni	10	5	3	Outside	TT	2	Vikash	17	20	5	India	TT	2	Vikash	4	20	7	Outside	Kabaddi	5	Suwan	30	3	1	India	Kabaddi	5	Suwan	10	1	0	Outside	1+1 +2
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Q.35	<p>A binary file library.dat contains records of library data in following format</p> <p style="text-align: center;">Book no, title, price , quantity</p> <p>writedata() :- This function takes record of 5 books and store them into library.dat file</p> <p>calculate_value():- This function display the contents of library data and also calculate the total cost of all the books available in library by calculating sum of price*quantity of each book.</p> <p>Fill in the blanks</p> <pre>import pickle rec=[] def writedata(): with open("library.dat","wb") as f:</pre>	
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	<pre> for x in range(5): bno=int(input("enter book no")) title=input("enter title") price=int(input("enter price")) quantity=int(input("enter quantity")) rec=[bno,title,price,quantity] pickle.dump(_____,f) # statement 1 def calculate_value(): with open("library.dat","_____") as f: # statement 2 try: sum1=_____ # statement 3 while True: _____=pickle.load(f) # statement 4 sum1=sum1+ (int(rec[2]) * int(rec[3])) print("the cost of library is :- ",sum1) except: pass </pre>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>
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Marking Scheme Practice Paper-1

SECTION A		
Q.1	True	1
Q.2	(c) dictionary	1
Q.3	d={1:None,2:None,3:None}	1
Q.4	(b)False	1
Q.5	<u>abc@gmail.com</u>	1
Q.6	With open	1
Q.7	(c)delete,drop	1
Q.8	d) insert command insert many rows	1
Q.9	(b) t=(10,20)+(30)	1
Q.10	(c.) candidate key	1
Q.11	(c.) F=open("abc.dat","rb")	1
Q.12	(c) A view of existing column with different name	1
Q.13	(a) Telnet	1
Q.14	(c) Both a and b is correct	1
Q.15	(b) show tables	1
Q.16	(c) mcur.execute("show databases")	1
Q.17	IV. A is False but R is True	1
Q.18	(a) A and R are True and R is correct explanation of A	1
SECTION B		
Q.19	def funpara(a=20, c, b=10) : # default parameter after non default and : <u>missing</u> if a>b: print("first is big") # tab missing else: print("second is big") return("Third number is missing") # return ½ mark for each error	2
Q.20	Circuit switching ensures ordered delivery of packets but it will not allow others to use the path even no data is being sent. OR HTML Hyper Text Markup Language. Yes it has pre defined tags.	2
Q.21	(a) print(s1[::-1]) (b) 1,100 2,100	1 1
Q.22	How many candidate key and primary key a table can have? Can we declared combination of fields as a primary key?	2
Q.23	(a) FTP File Transfer Protocol (b) Transmission Control Protocol/ Internet Protocol	2
Q.24	(d) All are possible OR Minimum 0 and maximum 1	2
Q.25	select * from student where fee IS NULL OR Delete is DML command and it deletes only data Drop is DDL command it delete data as well entire structure of table	2
SECTION C		

Q.26	<p>(a) Non equi join is Cartesian product of two table where each row of first table is joined with every row of second table. If m and n is total number of rows in both table then non equi join will have m x n rows</p> <p>Equi join is applied if there exist one common column in each tables whose values can be matched.</p> <p>(a) 4 (b) 3 3 (c) 45 52 (d) 3</p>	1+2																																																
Q.27	<pre>def readstar(): f=open("STORY.TXT","r") l=f.readlines() # it will return list of lines count=0 for x in l: count=count+1 if x in "*": print("Line no ", count, " has star")</pre> <p style="text-align: center;">OR</p> <pre>def word5count(): f=open("STORY.TXT","r") s=f.read() l=s.split() count=0 for x in l: if len(x)>5: count=count+1 print(" total words having length more then 5 are ", count)</pre>	3																																																
Q.28	<p>(a) Consider the doctor and patient table and write the output of (i) to (iv)</p> <p style="text-align: center;">Doctor</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Docid</th> <th>Dname</th> <th>Specialization</th> <th>Outdoor</th> </tr> </thead> <tbody> <tr> <td>D1</td> <td>MANISH</td> <td>PHYSICIAN</td> <td>MONDAY</td> </tr> <tr> <td>D2</td> <td>PARESH</td> <td>EYE</td> <td>FRIDAY</td> </tr> <tr> <td>D3</td> <td>KUMAR</td> <td>ENT</td> <td>SATURDAY</td> </tr> <tr> <td>D4</td> <td>AKASH</td> <td>ENT</td> <td>TUESDAY</td> </tr> </tbody> </table> <p style="text-align: center;">Patient</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Pid</th> <th>Pname</th> <th>Did</th> <th>Date_visit</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>Lal singh</td> <td>D2</td> <td>2022-04-25</td> </tr> <tr> <td>P2</td> <td>Arjun</td> <td>D1</td> <td>2022-05-05</td> </tr> <tr> <td>P3</td> <td>Narender</td> <td>D4</td> <td>2022-03-13</td> </tr> <tr> <td>P4</td> <td>Mehul</td> <td>D3</td> <td>2022-07-20</td> </tr> <tr> <td>P5</td> <td>Naveen</td> <td>D2</td> <td>2022-05-18</td> </tr> <tr> <td>P6</td> <td>Amit</td> <td>D1</td> <td>2022-01-22</td> </tr> </tbody> </table> <p>(I) 3 (II) 1 1 2 (III)</p>	Docid	Dname	Specialization	Outdoor	D1	MANISH	PHYSICIAN	MONDAY	D2	PARESH	EYE	FRIDAY	D3	KUMAR	ENT	SATURDAY	D4	AKASH	ENT	TUESDAY	Pid	Pname	Did	Date_visit	P1	Lal singh	D2	2022-04-25	P2	Arjun	D1	2022-05-05	P3	Narender	D4	2022-03-13	P4	Mehul	D3	2022-07-20	P5	Naveen	D2	2022-05-18	P6	Amit	D1	2022-01-22	3
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Q.29	<pre>def exchange(a,b): c=a.extend(b) return c.sort() 1 mark for defining function and return key word 1 mark for joining two list 1 mark for sorting list</pre>	3														
Q.30	<p>(i)</p> <pre>Lname=['narender', 'jaya', 'raju', 'ramesh', 'anita', 'Piyush'] Lage=[45,23,59,34,51,43] Lnameage=[] def push_na(): for x in range(len(Lname)): if Lage[x]>50: Lnameage.append((Lname[x],Lage[x])) print(Lnameage) push_na()</pre> <p>(ii)</p> <pre>def pop_na(): if len(Lnameage)==0: print("Underflow") else: t=Lnameage.pop() print("The name removed is ",t[0]) print("The age of person is ",t[1]) pop_na()</pre> <p>1 ½ marks for each function</p> <p style="text-align: center;">OR</p> <p>(i)</p> <pre>stu={1:56,2:45,3:78,4:65,5:35,6:90} stack_roll=[] stack_marks=[] def push_stu(): for x,y in stu.items(): if y>60: stack_roll.append(x) stack_marks.append(y) push_stu()</pre> <p>(ii) def pop_stu():</p> <pre>if len(stack_roll)==0: print("underflow") else:</pre>	3														

	stack_roll.pop() stack_marks.pop() pop_stu()	
SECTION D		
Q.31	(i) SWITCH (ii) FIREWALL (iii) ANTI VIRUS (iv) Any Suitable layout (v) Admin office	1 1 1 1 1
Q.32	(a)Way gma (b) Mysql.connector #statement 1 cur1.execute # statement 2 rec # statement 3 <p style="text-align: center;">OR</p> A mysql table class contains following columns -Roll no -Name -Marks The mysql database has following details User ='python' Password='test' database=student <p>The code given below calculates the sum of marks of all students. Fill in the blanks:</p> <pre>import mysql.connector con=_____.connect(# statement 1 host='localhost', user='python', password='test', database='student') cur1=con.cursor() rec=_____("select * from class") # statement 2 total=0 for x in _____: # statement 3 total=total+int(x[2]) print("total marks of all students :- ", total) cur1.close()</pre> <p style="text-align: center;">OR</p> (a) 12 30 65 (b) Mysql.connector # statement 1 price,product # statement 2 sqlquery # statement 3	2+3
Q.33	import csv def createcsv():	5

```

f=open("result.csv","w", newline="")
w=csv.writer(f)
w.writerow([1,'amit',40,34,90,""])
w.writerow([2,'bipin',78,34,90,""])
w.writerow([3,'camal',40,45,9,""])
f.close()

import csv
def copycsv():
    f=open("result.csv","r")
    f1=open("final.csv","w",newline="")
    w1=csv.writer(f1)
    r=csv.reader(f)
    for x in r:
        x[5]=int(x[2])+int(x[3])+int(x[4])
        w1.writerow(x)

f.close()
f1.close()

```

OR

```

Import csv
(a) def countresult():
    f=open("result.csv","r")
    count=count+1
    r=csv.reader(f)
    for x in r:
        count=count+1
    print(" total records are ", count)

(b) def delestu():
    f=open("result.csv","r")
    f1=open("final.csv","w",newline="")
    w1=csv.writer(f1)
    r=csv.reader(f)
    for x in r:
        if int(x[0])==2:
            pass
        else:
            w1.writerow(x)

f.close()
f1.close()

```

SECTION E

Q.34

A table GAME has following structure and data

Gname	NoPlayer	Captain	Won	lost	draw	Location
Cricket	11	Dhoni	25	5	10	India
Cricket	11	Dhoni	10	5	3	Outside
TT	2	Vikash	17	20	5	India
TT	2	Vikash	4	20	7	Outside
Kabaddi	5	Suwan	30	3	1	India
Kabaddi	5	Suwan	10	1	0	Outside

- I. There is no any candidate key as every field has duplicate values
- II. 3

1+1
+2

	III. Desc game IV. Delete from game where captain="Dhoni" and Location="outside"; <p style="text-align: center;">OR</p> (i) Alter table drop draw (ii) Update game set noplayer=6 where gname='Kabaddi'	
Q.35	(i) rec (ii)Rb (iii)0 (iv)rec	1 1 1 1

KENDRIYA VIDYALAYA SANGATHAN, JAIPUR REGION

Class: XII Session: 2022-23

Computer Science (083)

Practice Paper -2

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.

QNo	SECTION-A	Marks
1	Which of the following is not a keyword python? (a) Eval (b) assert (c) nonlocal (d) pass	1
2	Which of the following is an invalid datatype in Python? (a) list (b) Dictionary (c) Tuple (d) Class	1
3	What will be the output for the following Python statement? D={'AMIT':90,'RESHMA':96,'SUKHBIR':92,'JOHN':95} print('JOHN' in D, 90 in D, sep="#") (a) True#False (b) True#True (c) False#True (d) False#False	1
4	Consider the given expression: True and False or not True Which of the following will be correct output if the given expression is evaluated? (a) True (b) False (c) NONE (d) NULL	1
5	Select the correct output of the code: count = 0 while(True): if count % 3 == 0: print(count, end = " ") if(count > 15): break; count += 1 (a) 0 1 2 15 (b) Infinite loop (c) 0 3 6 9 12 15 (d) 0 3 6 9 12	1
6	Which of the following is not a valid mode to open a file? (a) ab (b) r+ (c) w+ (d) rw	1

7	<p>Which attribute(s) have all the properties of primary key.</p> <p>(a) foreign key (b) alternate key (c) candidate key (d) Both (a) and (c)</p>	1
8	<p>Which command is used to change some values in existing rows?</p> <p>(a) UPDATE (b) ORDER (c) ALTER (d) CHANGE</p>	1
9	<p>What possible output(s) are expected to be displayed on screen at the time of execution of the program from the following code?</p> <pre>import random points=[20,40,10,30,15] points=[30,50,20,40,45] begin=random.randint(1,3) last=random.randint(2,4) for c in range(begin,last+1): print(points[c], "#")</pre> <p>(a) 20#50#30# (b) 20#40#45 (c) 50#20#40# (d) both (b) and (c)</p>	1
10	<p>Fill in the blank:</p> <p>_____ is an attribute whose value is derived from the primary key of some other table.</p> <p>(a) Primary Key (b) Foreign Key (c) Candidate Key (d) Alternate Key</p>	1
11	<p>Which function is used to split a line in columns?</p> <p>(a) split() (b) spt() (c) split_line() (d) all of these</p>	1
12	<p>Consider the following statement:</p> <p>Select * from product order by rate , item_name.....</p> <p>Which of the following option should be used to display the 'rate' from greater to smaller and 'name' in alphabetical order?</p> <p>(a) ASC, DESC (b) DESC, ASC (c) Descending, Ascending (d) Ascending, Descending</p>	1
13	<p>Which switching technique follows the store and forward mechanism?</p> <p>(a) Circuit switching (b) message switching (c) packet switching (d) All of these</p>	1
14	<p>What will the following expression be evaluated to in Python?</p> <p>print(16-(3+2)*5+2**3*4)</p> <p>(a) 54 (b) 46 (c) 23 (d) 32</p>	1
15	<p>What values does the count(<column_name>) function ignore?</p> <p>(a) Repetitive values (b) Null values (c) Characters (d) Integers</p>	1
16	<p>To get all the records from the result set, you may use.....</p> <p>(a) cursor.fetchmany() (b) cursor.fetchall() (c) select * from <table name>; (d) cursor.allrecords()</p>	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):- key word arguments are related to the function calls. Reasoning (R):- when you use keyword arguments in a function call, the caller identifies the arguments by parameter name.	1
18	Assertion (A): CSV stands for Comma Separated Values Reason (R): CSV files are a common file format for transferring and storing data.	1
SECTION-B		
19	Observe the following Python code very carefully and rewrite it after removing all syntactical errors with each correction underlined. <pre>DEF execmain(): x = input("Enter a number:") if (abs(x)== x) print("You entered a positive number") else: x=*1 print("Number made positive:" x)</pre>	2
20	Write two points of difference between Packet Switching and Message Switching. OR Write two points of difference between XML and HTML.	2
21	(a) Given is a Python string declaration: S="python rocks" Write the output of: print(S[7:11]*3) (b) Write the output of the code given below: <pre>my_dict = {"name": "Aman", "age": 26} my_dict['age'] = 27 my_dict['address'] = "Delhi" print(my_dict.keys())</pre>	1+1=2
22	Differentiate between Primary Key and Candidate Key.	2
23	(a) Write the full forms of the following: (i) IMAP (ii) POP (b) Define VoIP?	1+1=2
24	Predict the output of the Python code given below: <pre>def Alter(P=15,Q=10): P=P*Q Q=P/Q print(P,"#",Q) return Q A=100</pre>	2

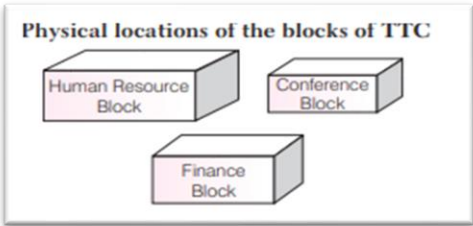
	<pre> B=200 A=Alter(A,B) print(A,"\$",B) B=Alter(B) print(A,"\$",B) A=Alter(A) print(A,"\$",B) </pre> <p style="text-align: center;">OR</p> <p>Predict the output of the Python code given below:</p> <pre> t=tuple() t=t + tuple('Python') print(t) print(len(t)) t1=(10,20,30) print(len(t1)) </pre>	
--	--	--

25	<p>Differentiate between DDL and DML commands with suitable example.</p> <p style="text-align: center;">OR</p> <p>What is the difference between WHERE and HAVING clause of SQL statement?</p>	2
----	---	---

SECTION - C

26	<p>(a) Consider the following tables - Bank_Account and Branch:</p> <p>Bank_Account:</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>ACode</th> <th>Name</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>A01</td> <td>Amit</td> <td>Savings</td> </tr> <tr> <td>A02</td> <td>Parth</td> <td>Current</td> </tr> <tr> <td>A03</td> <td>Mira</td> <td>Current</td> </tr> </tbody> </table> <p>Branch:</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>ACode</th> <th>City</th> </tr> </thead> <tbody> <tr> <td>A01</td> <td>Delhi</td> </tr> <tr> <td>A02</td> <td>Jaipur</td> </tr> <tr> <td>A01</td> <td>Ajmer</td> </tr> </tbody> </table> <p>What will be the output of the following statement? SELECT * FROM Bank_Account NATURAL JOIN Branch;</p> <p>(b) Give the output of the following sql statements as per table given above.</p> <p style="text-align: center;">Table : SPORTS</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>StudentNo</th> <th>Class</th> <th>Name</th> <th>Game1</th> <th>Grade1</th> <th>Game2</th> <th>Grade2</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>7</td> <td>Sammer</td> <td>Cricket</td> <td>B</td> <td>Swimming</td> <td>A</td> </tr> <tr> <td>11</td> <td>8</td> <td>Sujit</td> <td>Tennis</td> <td>A</td> <td>Skating</td> <td>C</td> </tr> <tr> <td>12</td> <td>7</td> <td>Kamal</td> <td>Swimming</td> <td>B</td> <td>Football</td> <td>B</td> </tr> <tr> <td>13</td> <td>7</td> <td>Venna</td> <td>Tennis</td> <td>C</td> <td>Tennis</td> <td>A</td> </tr> <tr> <td>14</td> <td>9</td> <td>Archana</td> <td>Basketball</td> <td>A</td> <td>Cricket</td> <td>A</td> </tr> <tr> <td>15</td> <td>10</td> <td>Arpit</td> <td>Cricket</td> <td>A</td> <td>Athletics</td> <td>C</td> </tr> </tbody> </table> <p>i. SELECT COUNT(*) FROM SPORTS.</p>	ACode	Name	Type	A01	Amit	Savings	A02	Parth	Current	A03	Mira	Current	ACode	City	A01	Delhi	A02	Jaipur	A01	Ajmer	StudentNo	Class	Name	Game1	Grade1	Game2	Grade2	10	7	Sammer	Cricket	B	Swimming	A	11	8	Sujit	Tennis	A	Skating	C	12	7	Kamal	Swimming	B	Football	B	13	7	Venna	Tennis	C	Tennis	A	14	9	Archana	Basketball	A	Cricket	A	15	10	Arpit	Cricket	A	Athletics	C	1+2=3
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	ii. SELECT DISTINCT Class FROM SPORTS. iii. SELECT MAX(Class) FROM SPORTS; iv. SELECT COUNT(*) FROM SPORTS GROUP BY Game1;																																																																									
27	<p>Write a method in Python to read lines from a text file DIARY.TXT, and display those lines, which are starting with an alphabet 'A'.</p> <p>For example If the file content is as follows: An apple a day keeps the doctor away. We all pray for everyone's safety. A marked difference will come in our country.</p> <p>The display() function should display the output as: An apple a day keeps the doctor away. A marked difference will come in our country.</p> <p style="text-align: center;">OR</p> <p>Write a method/function DISPLAYWORDS() in python to read lines from a text file STORY.TXT, and display those words, which are less than 4 characters.</p>	1+2																																																																								
28 (a)	<p>(a) consider the following tables School and Admin and answer the following questions:</p> <p style="text-align: center;">TABLE: SCHOOL</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>CODE</th> <th>TEACHER</th> <th>SUBJECT</th> <th>DOJ</th> <th>PERIODS</th> <th>EXPERIENCE</th> </tr> </thead> <tbody> <tr> <td>1001</td> <td>RAVI</td> <td>ENGLISH</td> <td>12/03/2000</td> <td>24</td> <td>10</td> </tr> <tr> <td>1009</td> <td>PRIYA</td> <td>PHYSICS</td> <td>03/09/1998</td> <td>26</td> <td>12</td> </tr> <tr> <td>1203</td> <td>LISA</td> <td>ENGLISH</td> <td>09/04/2000</td> <td>27</td> <td>5</td> </tr> <tr> <td>1045</td> <td>YASH RAJ</td> <td>MATHS</td> <td>24/08/2000</td> <td>24</td> <td>15</td> </tr> <tr> <td>1123</td> <td>GAGAN</td> <td>PHYSICS</td> <td>16/07/1999</td> <td>28</td> <td>3</td> </tr> <tr> <td>1167</td> <td>HARISH</td> <td>CHEMISTRY</td> <td>19/10/1999</td> <td>27</td> <td>5</td> </tr> <tr> <td>1215</td> <td>UMESH</td> <td>PHYSICS</td> <td>11/05/1998</td> <td>22</td> <td>16</td> </tr> </tbody> </table> <p style="text-align: center;">TABLE : ADMIN</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>CODE</th> <th>GENDER</th> <th>DESIGNATION</th> </tr> </thead> <tbody> <tr> <td>1001</td> <td>MALE</td> <td>VICE PRINCIPAL</td> </tr> <tr> <td>1009</td> <td>FEMALE</td> <td>COORDINATOR</td> </tr> <tr> <td>1203</td> <td>FEMALE</td> <td>COORDINATOR</td> </tr> <tr> <td>1045</td> <td>MALE</td> <td>HOD</td> </tr> <tr> <td>1123</td> <td>MALE</td> <td>SENIOR TEACHER</td> </tr> <tr> <td>1167</td> <td>MALE</td> <td>SENIOR TEACHER</td> </tr> <tr> <td>1215</td> <td>MALE</td> <td>HOD</td> </tr> </tbody> </table> <p>Give the output of the following SQL queries:</p> <ol style="list-style-type: none"> Select Designation, count(*) from Admin Group by Designation having count(*)<2; Select max(experience) from school; Select teacher from school where experience >12 order by teacher; Select count(*), gender from admin group by gender; 	CODE	TEACHER	SUBJECT	DOJ	PERIODS	EXPERIENCE	1001	RAVI	ENGLISH	12/03/2000	24	10	1009	PRIYA	PHYSICS	03/09/1998	26	12	1203	LISA	ENGLISH	09/04/2000	27	5	1045	YASH RAJ	MATHS	24/08/2000	24	15	1123	GAGAN	PHYSICS	16/07/1999	28	3	1167	HARISH	CHEMISTRY	19/10/1999	27	5	1215	UMESH	PHYSICS	11/05/1998	22	16	CODE	GENDER	DESIGNATION	1001	MALE	VICE PRINCIPAL	1009	FEMALE	COORDINATOR	1203	FEMALE	COORDINATOR	1045	MALE	HOD	1123	MALE	SENIOR TEACHER	1167	MALE	SENIOR TEACHER	1215	MALE	HOD	2+1=3
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	(b) Write SQL command to delete a table from database.													
29	<p>Write a function <code>old_list(L)</code>, where L is the list of elements passed as argument to the function. The function returns another list named 'newList' that stores the indices of all Non-Zero Elements of L.</p> <p>For example: If L contains [2,4,0,1,0,6] The newList will have - [0,1,3,5]</p>	3												
30	<p>Write <code>Add_New(Book)</code> and <code>Remove(Book)</code> methods in Python to Add a new Book and Remove a Book from a List of Books, considering them to act as PUSH and POP operations of the data structure stack.</p> <p style="text-align: center;">OR</p> <p>Aalia has a list containing 10 integers. You need to help him create a program with separate user defined functions to perform the following operations based on this list.</p> <ul style="list-style-type: none"> ➤ Traverse the content of the list and push the even numbers into a stack. ➤ Pop and display the content of the stack. <p>For example: If the sample content of the list is as follows: <code>N=[12,13,34,56,21,79,98,22,35,38]</code> Sample output of the code should be: 38 22 98 56 34 12</p>	1+2												
SECTION - D														
31	<p>Trine Tech Corporation (TTC) is a professional consultancy company. The company is planning to set up their new offices in India with its hub at Hyderabad. As a network adviser, you have to understand their requirement and suggest them the best available solutions. Their queries are mentioned as (i) to (v) below.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="border: 1px solid gray; padding: 5px; width: 45%;"> <p style="text-align: center; margin: 0;">Physical locations of the blocks of TTC</p>  </div> <div style="border: 1px solid gray; padding: 5px; width: 45%;"> <p style="text-align: center; margin: 0;">Block to block distance (in m)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Block (From)</th> <th>Block (To)</th> <th>Distance</th> </tr> </thead> <tbody> <tr> <td>Human Resource</td> <td>Conference</td> <td>110</td> </tr> <tr> <td>Human Resource</td> <td>Finance</td> <td>40</td> </tr> <tr> <td>Conference</td> <td>Finance</td> <td>80</td> </tr> </tbody> </table> </div> </div>	Block (From)	Block (To)	Distance	Human Resource	Conference	110	Human Resource	Finance	40	Conference	Finance	80	5
Block (From)	Block (To)	Distance												
Human Resource	Conference	110												
Human Resource	Finance	40												
Conference	Finance	80												

Expected number of computers	
Block	Computers
Human Resource	25
Finance	120
Conference	90

- a) Which will be the most appropriate block, where TTC should plan to install their server?
- b) Draw a block to block cable layout to connect all the buildings in the most appropriate manner for efficient communication.
- c) What will be the best possible connectivity out of the following, you will suggest to connect the new setup of offices in Bangalore with its London based office.
- Satellite Link
 - Infrared
 - Ethernet
- d) Which of the following device will be suggested by you to connect each computer in each of the buildings?
- Switch
 - Modem
 - Gateway
- e) Company is planning to connect its offices in Hyderabad which is less than 1 km. Which type of network will be formed?

32

(a) Write the output of the code given below:

```
p=25
def
sum(q,r=3):
    global p
    p=r+q*
    *2
    print(p, end= '#')

a=6
b=4
sum(a,b)
sum(r=5,q=1)
```

(c) The code given below inserts the following record in the table mobile:

```
import mysql.connector
mycon = mysql.connector.connect (host = "localhost", user = "Admin",
passwd = "Admin@123", database = "connect")
cursor = mycon.____ ( ) # Statement 1
sql = "INSERT INTO Mobile (Name, Model, Price, Qty) VALUES (%s, %s, %s, %s)" val = ("Samsung", "Galaxy Pro", 28000, 3)
cursor...____ (sql,val) #Statement 2
mycon.____ #Statement 3
```

5

	<p>Write the missing statement: Statement1 , Statement2 and Statement3</p> <p style="text-align: center;">OR</p> <p>(a) Predict the output of the code given below: L1 = [100,900,300,400,500] START = 1 SUM = 0 for C in range (START,4): SUM = SUM + L1[C] print (C,":",SUM) SUM = SUM + L1[0]*10 print (SUM)</p> <p>(b) The code given below reads the following record from the tablenamed student and displays only those records who have marks greater than 80: RollNo - integer Name - string Clas - integer Marks - integer</p> <p>Note the following to establish connectivity between Python andMYSQL: <ul style="list-style-type: none"> • Username is root • Password is tiger • The table exists in a MYSQL database named kvs. 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 80. Statement 3- to read the complete result of the query (records whose marks are greater than 80) 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)</p>	
33	<p>a. What is the advantage of using a csv file for permanent storage?</p> <p>b. Write a Program in Python that defines and calls the following user defined functions: (i) ADD() – To accept and add data of a student to a CSV file 'record.csv'. Each record consists of a list with field elements as sid, name and class to store student_id, student_name and class respectively. (ii) COUNT() – To count the number of records present in the CSV file named 'record.csv'.</p>	+2+2=5

	OR	
	<p>a Write difference between a binary file and a csv file.</p> <p>b. Write a Program in Python that defines and calls the following user defined functions:</p> <p>(i) add() - To accept and add data of an employee to a CSV file 'empdata.csv'. Each record consists of a list with field elements as eid, ename and salary to store empid, emp name and emp salary respectively.</p> <p>(ii) search()- To display the records of the emp whose salary is more than 10000.</p>	

SECTION -E

34	<p>Mayank creates a table RESULT with a set of records to maintain the marks secured by students in sub1, sub2, sub3 and their GRADE. After creation of the table, he has entered data of 7 students in the table.</p> <p style="text-align: center;">Table : RESULT</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>ROLL_NO</th> <th>SNAME</th> <th>sub1</th> <th>sub2</th> <th>sub3</th> <th>GRADE</th> </tr> </thead> <tbody> <tr> <td>101</td> <td>KIRAN</td> <td>366</td> <td>410</td> <td>402</td> <td>I</td> </tr> <tr> <td>102</td> <td>NAYAN</td> <td>300</td> <td>350</td> <td>325</td> <td>I</td> </tr> <tr> <td>103</td> <td>ISHIKA</td> <td>400</td> <td>410</td> <td>415</td> <td>I</td> </tr> <tr> <td>104</td> <td>RENU</td> <td>350</td> <td>357</td> <td>415</td> <td>I</td> </tr> <tr> <td>105</td> <td>ARPITA</td> <td>100</td> <td>75</td> <td>178</td> <td>IV</td> </tr> <tr> <td>106</td> <td>SABRINA</td> <td>100</td> <td>205</td> <td>217</td> <td>II</td> </tr> <tr> <td>107</td> <td>NEELIMA</td> <td>470</td> <td>450</td> <td>471</td> <td>I</td> </tr> <tr> <td>103</td> <td>ISHIKA</td> <td>400</td> <td>410</td> <td>415</td> <td>I</td> </tr> </tbody> </table> <p>Based on the data given above answer the following questions:</p> <p>(i) Identify the most appropriate column, which can be considered as Primary key.</p> <p>(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?</p> <p>(iii) Write the statements to:</p> <p>a. Insert the following record into the table Roll No- 108, Name- Aaditi, sub1- 470, sub2-444, sub3-475, Grade- I.</p> <p>b. Increase the sub2 marks of the students by 3% whose name begins with 'N'.</p> <p style="text-align: center;">OR (Option for part iii only)</p> <p>(iii) Write the statements to:</p> <p>a. Delete the record of students securing Grade-IV.</p> <p>b. Add a column REMARKS in the table with datatype as varchar with 50 characters.</p>	ROLL_NO	SNAME	sub1	sub2	sub3	GRADE	101	KIRAN	366	410	402	I	102	NAYAN	300	350	325	I	103	ISHIKA	400	410	415	I	104	RENU	350	357	415	I	105	ARPITA	100	75	178	IV	106	SABRINA	100	205	217	II	107	NEELIMA	470	450	471	I	103	ISHIKA	400	410	415	I	4
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103	ISHIKA	400	410	415	I																																																			
35	<p>Anamika is a Python programmer. She has written a code and created a binary file data.dat with sid, sname and marks. The file contains 10 records. She now has to update a record based on the sid entered by the user and update the marks. The updated record is then to be written in the file extra.dat. The records which are not to be updated also have to be written to the file extra.dat. If the sid is not found, an appropriate message should to be displayed.</p> <p>As a Python expert, help him to complete the following code based on requirement given above:</p>	4																																																						

<pre> import def update_data(): rec={} fin=open("data.dat","rb") fout=open(" ") found=False eid=int(input("Enter student id to update their marks :: ")) while True: try: rec=_____ if rec["student id"]==sid: found=True rec["marks"]=int(input("Enter new marks:: ")) pickle._____ else: pickle.dump(rec,fout) except: break if found==True: print("The marks of student id ",sid," hasbeen updated.") else: print("No student with such id is not found") fin.close() fout.close() </pre> <p>(i) Which module should be imported in the program? (Statement1)</p> <p>(ii) Write the correct statement required to open a temporary file named extra.dat. (Statement 2)</p> <p>(iii) Which statement should Anamika fill in Statement 3 to read the data from the binary file, data.dat and in Statement 4 to write the updated data in the file, extra.dat?</p>	<p>#Statement 1</p> <p>#Statement 2</p> <p>#Statement 3</p> <p>#Statement 4</p>
--	---

Class: XII Session: 2022-23
Computer Science (083)
Answer Key- Practice Paper-2

Q.No.	Answer	Marks
1	Eval	1
2	Class	1
3	True#False	1
4	False	1
5	0 3 6 9 12 15	1
6	rw	1
7	. (d) Both (a) and (c)	1
8	UPDATE	1
9	(d) both b and c	1
10	(b) Foreign Key	1
11	(a) split()	1
12	(b) DESC,ASC	1
13	(b) message switching	1
14	(c) 23	1
15	(b) Null values	1
16	(b) cursor.fetchall()	1
17	Option (a) is correct	1
18	Option (b) is correct	1
19	Ans: <code>def execmain():</code> <code>x = input("Enter a number:")</code> <code>if (abs(x) == x):</code> <code>print("You entered a positive number")</code> <code>else:</code> <code>x*=-1</code> <code>print("Number made positive:" ,x)</code> ½ mark for each error correction	2
20	Write two points of difference between Packet Switching and Message Switching. 2 <p style="text-align: center;">OR</p> Write two points of difference between XML and HTML.	
21	(a) Ans: rockrockrock (b) <code>dict_keys(['name', 'age', 'address'])</code>	
22	Differentiate between Primary Key and Candidate Key.	
23	a) i. Internet Mail Access Protocol ii. Post office Protocol (b) Ans: VoIP(Voice over Internet Protocol) refers to a way to carry telephone calls over an IP data network. It offers a set of facilities to manage the delivery of voice information over internet in digital form.	
24	Ans: 20000 # 100.0 100.0 \$ 200 2000 # 200.0	2

	<p>100.0 \$ 200.0 1000.0 # 100.0 100.0 \$ 200.0</p> <p style="text-align: center;">OR</p> <p>Ans: (‘Python’) 1 3</p>																																
25	<p>Ans: DDL provides statements for creation and deletion of the database tables, views, etc. The DDL provides a set of definitions to specify the storage structure in a database system. Some DDL statements are as follows</p> <p>(i) CREATE used to create new table in the database. (ii) DROP used to delete tables from the database. (iii) ALTER used to change the structure of the database table. This statement can add up additional column, drop existing, and even change the data type of columns involved in a database table. (iv) RENAME used to rename a table.</p> <p>DML provides statements for manipulating the database objects. It is used to query the databases for information retrieval. Some DML statements are as follows-</p> <p>(i) INSERT used to insert data into a table. (ii) SELECT used to retrieve data from a database. (iii) UPDATE used to update existing data within a table. (iv) DELETE used to delete all records from a table</p> <p style="text-align: center;">OR</p> <p>Ans: The difference between WHERE and HAVING clause is that WHERE condition are applicable on individual rows whereas HAVING condition are applicable on groups as formed by GROUP BY clause.</p>																																
26	<p>26. (a) Ans:</p> <table border="1" data-bbox="464 1256 1160 1429"> <thead> <tr> <th>ACode</th> <th>Name</th> <th>Type</th> <th>City</th> </tr> </thead> <tbody> <tr> <td>A01</td> <td>Amit</td> <td>Savings</td> <td>Delhi</td> </tr> <tr> <td>A01</td> <td>Amit</td> <td>Savings</td> <td>Ajmer</td> </tr> <tr> <td>A02</td> <td>Parth</td> <td>Current</td> <td>Jaipur</td> </tr> </tbody> </table> <p>(b) Ans:</p> <p>i. 6</p> <p>ii.</p> <table border="1" data-bbox="513 1487 668 1700"> <thead> <tr> <th>Class</th> </tr> </thead> <tbody> <tr> <td>7</td> </tr> <tr> <td>8</td> </tr> <tr> <td>9</td> </tr> <tr> <td>10</td> </tr> </tbody> </table> <p>iii. 10</p> <p>iv.</p> <table border="1" data-bbox="312 1765 745 1977"> <thead> <tr> <th>Game1</th> <th>Count(*)</th> </tr> </thead> <tbody> <tr> <td>Cricket</td> <td>2</td> </tr> <tr> <td>Tennis</td> <td>2</td> </tr> <tr> <td>Swimming</td> <td>1</td> </tr> <tr> <td>Basketball</td> <td>1</td> </tr> </tbody> </table>	ACode	Name	Type	City	A01	Amit	Savings	Delhi	A01	Amit	Savings	Ajmer	A02	Parth	Current	Jaipur	Class	7	8	9	10	Game1	Count(*)	Cricket	2	Tennis	2	Swimming	1	Basketball	1	<p>1</p> <p>$\frac{1}{2} \times 4 = 2$</p>
ACode	Name	Type	City																														
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27	<p>Ans: def COUNTLINES(): c=0 f=open('STORY.TXT') l=f.readlines() for i in l: if i[0]=='A' or i[0]='a': #or if i[0] in ["A","a"] c=c+1 print("Total lines ",c) f.close()</p> <p style="text-align: center;">OR</p> <p>Write a method/function DISPLAYWORDS() in python to read lines from a text file STORY.TXT, and display those words, which are less than 4 characters.</p>	3						
28	<p>i.</p> <table border="1" data-bbox="424 734 900 779"> <tr> <td>Vice principal</td> <td>01</td> </tr> </table> <p>ii. 16 iii. UMESH YASHRAJ</p> <p>iv.</p> <table border="1" data-bbox="504 891 820 981"> <tr> <td>5</td> <td>Male</td> </tr> <tr> <td>2</td> <td>Female</td> </tr> </table> <p>(b) drop table <table name.>;</p>	Vice principal	01	5	Male	2	Female	
Vice principal	01							
5	Male							
2	Female							
29	<pre>def oldList(L): newList=[] for i in range(len(L)): if L[i]!=0: newList.append(i) return newList</pre> <p>(½ mark for correct function header 1 mark for correct loop 1 mark for correct if statement ½ mark for return statement) Note: Any other relevant and correct code may be marked</p>							
30	<pre>Books=[] Def Addnew (books,name): Books.append(name) Print("book1:",name,"inserted") Def remove(books): If books==[]: Print("stack is empty") Else: Print("book:",books.pop(), "deleted")</pre> <p>1 marks for each correct definition 1 marks for each statement</p> <p style="text-align: center;">OR</p> <p>N=[12,12,34,56,21,79,98,22,35,38]</p>	3						

	<pre> def PUSH(S,N): S.append() def POP(S): If S!=[]: return S.pop() else: return None ST=[] for k in N: if k%2==0 PUSH(ST,k) while True: If ST![]: print(POP(ST),end=" ") else: break </pre>	
<p>31</p>	<p>(i) TTC should install its server in finance block as it is having maximum number of computers.</p> <p>(ii) The layout is based on minimum cable length required, which is 120 metres in the above case.</p> <div data-bbox="608 862 1074 1057" data-label="Diagram"> <pre> graph TD HR[Human Resource Block] --- F[Finance Block] C[Conference Block] --- F </pre> </div> <p>(iii) Satellite Link. (iv) Switch. (v) LAN</p>	
<p>32.</p>	<p>a) 40#6# 2 (b) 3</p> <p style="text-align: center;">OR</p> <p>(a)Ans: 2 3 : 1600 2600 (a) Ans: Statement 1: con1.cursor() Statement 2: mycursor.execute("select * from student where Marks>80") Statement 3: mycursor.fetchall()</p>	
<p>33</p>	<p>Advantage of a csv file: It is human readable – can be opened in Excel and Notepad applications It is just like text file</p> <pre> import csv def ADD(): fout=open("record.csv","a",newline="\n") wr=csv.writer(fout) </pre>	

```

empid=int(input("Enter student id :: "))
name=input("Enter name :: ")
mobile=int(input("Enter marks :: "))
lst=[sid,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

Ans: 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():
    fout=open("empdata.csv","a",newline='\n')
    wr=csv.writer(fout)
    fid=int(input("Enter Emp Id :: "))
    fname=input("Enter Emp name :: ")
    fprice=int(input("Enter psalary :: "))
    FD=[eid,ename,salary]
    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()

```

(iv) Ans: ROLL_NO

	<p>(v) Ans: New Degree: 8 New Cardinality: 5</p> <p>(vi) a. INSERT INTO RESULT VALUES (108, 'Aadit', 470, 444, 475, 'I'); b. UPDATE RESULT SET SEM2=SEM2+ (SEM2*0.03) WHERE SNAME LIKE "N%"; OR (Option for part iii only) DELETE FROM RESULT WHERE DIV='IV'; c. ALTER TABLE RESULT ADD (REMARKS VARCHAR(50));</p>	
	<p>(iv) pickle</p> <p>(v) fout=open('temp.dat', 'wb')</p> <p>(vi) Statement 3: pickle.load(fin)</p> <p>(vii) Statement 4: pickle.dump(rec,fout)</p>	

Class: XII Session: 2022-23
Computer Science (083)
Practice Paper -3

Maximum Marks: 70

Time Allowed: 3

hoursGeneral Instructions:

1. This question paper contains five sections, Section A to E.
2. All questions are compulsory.
3. Sections 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 Q.35 against Part-C only.
8. All programming questions are to be answered using Python Language only.

SECTION-A		
1.	Name the Python library module needed to be imported to invoke following functions: a. floor () b. randint ()	1
2.	To use function of any module, we have to use _____ (command) before the use of function of a module	1
3.	Identify the key and values from the dictionary given below? a. D = {"Rohan":{"Manager":427, "SBI", 05884 } }	1
4.	Which of the following is/are not assignment operator? a) **= b) /= c) == d) %=	1
5.	Find the output of the code: num = 7 def func () : num = 27 print(num)	1
6.	Which statement is used to retrieve the current position within the file: a. fp.seek() b. fp.tell() c. fp.loc d. fp.pos	1
7.	Clause used in select statement to collect data across multiple records and group the results by one or more columns: a. order by b. group by c. having d. where	1
8.	Which keyword eliminates redundant data from a SQL query result?	1
9.	What does the following code print to console? if True: print(50) else: print(100) a. True b. False c.50 d.100	1

10.	Fill in the blank: No. of rows in a relation is called (a) Degree b. Domain c. Cardinality d. Attributes	1
11.	Which of the following is not a correct Python statement to open a test file "Students.txt" to write content into it : a. f= open("Students.txt", 'a') b. f= open("Students.txt", 'w') c. f= open("Students.txt", 'w+') d. f= open("Students.txt", 'A')	1
12.	Fill in the blank: The clause, places condition with aggregate functions . a. HAVING b. WHERE c. IN d.BETWEEN	1
13.	Write the full forms of: a. PPP b. VOIP	1
14.	Find the output: tuple1 = (10,12,14,16,18,20,22,24,30) print(tuple1[5:7])	1
15.	Which of the following is not an aggregate function? a. AVG b. MAX c. JOIN d.COUNT	1
16.	Name the module used to establish a database connection with a python program.	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): Dictionaries are enclosed by curly braces { } Reason(R): The key-value pairs are separated by commas (,)	1
18.	Assertion(A): The random module is a built-in module to generate the pseudo-random variables. Reason(R): The randrange() function is used to generate a random number between the specified range in its parameter.	1
SECTION-B		
19.	Yuvika has to complete her computer science assignment of demonstrating the use of if-else statement. The code has some error(s). Rewrite the correct code underlining all the corrections made. marks = int("enter marks") temperature = input("enter temperature") if marks < 80 and temperature >= 40 print("Not Good") else print("OK")	2
20.	Write a short note on web hosting. OR What is work of TCP / IP explain.	2

21.	<p>Write the output after evaluating the following expressions:</p> <p>a) <code>k= 7 + 3 **2 * 5 // 8 - 3</code> <code>print(k)</code></p> <p>b) <code>m= (8>9 and 12>3 or not 6>8)</code> <code>print(m)</code></p>	1 1																								
22.	What do you understand by table constraint in a table? Give a suitable example in support of your answer.	2																								
23.	Expand the following terms: a. PAN b. HTML c. URL d. POP	2																								
24.	<p>Predict the output of the Python code given below:</p> <pre>def func(n1 = 1, n2= 2): n1= n1 * n2 n2= n2 + 2 print(n1, n2)</pre> <p><code>func()</code> <code>func(2,3)</code></p> <p style="text-align: center;">OR</p> <p>Predict the output of the Python code given below:</p> <pre>T= ["20", "50", "30", "40"] Counter=3 Total= 0 for I in [7,5,4,6]: newT=T[Counter] Total= float (newT) + I print(Total) Counter=Counter-1</pre>	2																								
25.	<p>Rohit wants to increase the size of the column FeeAmount by 5, which is possible category out of DML / DDL of command he has to use to: (Write DDL or DML alongwith command / query)</p> <p>Display the structure of table (DDL or DML) Increase the size of column FeeAmount by 5 (DDL or DML)</p> <p style="text-align: center;">OR</p> <p>Differentiate between char(n) and varchar(n) data types with respect to databases.</p>	2																								
SECTION C																										
26.	<p>(a) Observe the following table and answer the question accordingly</p> <p style="text-align: center;">Table:Product</p> <table border="1" data-bbox="344 1715 1262 1933"> <thead> <tr> <th>Pno</th> <th>Name</th> <th>Qty</th> <th>PurchaseDate</th> </tr> </thead> <tbody> <tr> <td>101</td> <td>Pen</td> <td>102</td> <td>12-12-2011</td> </tr> <tr> <td>102</td> <td>Pencil</td> <td>201</td> <td>21-02-2013</td> </tr> <tr> <td>103</td> <td>Eraser</td> <td>90</td> <td>09-08-2010</td> </tr> <tr> <td>109</td> <td>Sharpener</td> <td>90</td> <td>31-08-2012</td> </tr> <tr> <td>113</td> <td>Clips</td> <td>900</td> <td>12-12-2011</td> </tr> </tbody> </table> <p style="text-align: center;">What is the degree and cardinality of the above table?</p>	Pno	Name	Qty	PurchaseDate	101	Pen	102	12-12-2011	102	Pencil	201	21-02-2013	103	Eraser	90	09-08-2010	109	Sharpener	90	31-08-2012	113	Clips	900	12-12-2011	1+2
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113	Clips	900	12-12-2011																							

	<p>(b) Write the output of the queries (i) to (iv) based on the table, STUDENT given below:</p> <table border="1" data-bbox="352 174 1257 584"> <thead> <tr> <th>S.NO</th> <th>NAME</th> <th>STIPEND</th> <th>SUBJECT</th> <th>AVERAGE</th> <th>DIV</th> </tr> </thead> <tbody> <tr><td>1</td><td>KARAN</td><td>400</td><td>PHYSICS</td><td>68</td><td>I</td></tr> <tr><td>2</td><td>DIWAKAR</td><td>450</td><td>COMP Sc</td><td>68</td><td>I</td></tr> <tr><td>3</td><td>DIVYA</td><td>300</td><td>CHEMISTRY</td><td>62</td><td>I</td></tr> <tr><td>4</td><td>REKHA</td><td>350</td><td>PHYSICS</td><td>63</td><td>I</td></tr> <tr><td>5</td><td>ARJUN</td><td>500</td><td>MATHS</td><td>70</td><td>I</td></tr> <tr><td>6</td><td>SABINA</td><td>400</td><td>CHEMISTRY</td><td>55</td><td>II</td></tr> <tr><td>7</td><td>JOHN</td><td>250</td><td>PHYSICS</td><td>64</td><td>I</td></tr> <tr><td>8</td><td>ROBERT</td><td>450</td><td>MATHS</td><td>68</td><td>I</td></tr> <tr><td>9</td><td>RUBINA</td><td>500</td><td>COMP Sc</td><td>62</td><td>I</td></tr> <tr><td>10</td><td>VIKAS</td><td>400</td><td>MATHS</td><td>57</td><td>II</td></tr> </tbody> </table> <p>(i) Select MIN(AVERAGE) from STUDENT where SUBJECT="PHYSICS"; (ii) Select SUM(STIPEND) from STUDENT WHERE div=2; (iii) Select AVG(STIPEND) from STUDENT where AVERAGE>=65; (iv) Select COUNT(distinct SUBJECT) from STUDENT;</p>	S.NO	NAME	STIPEND	SUBJECT	AVERAGE	DIV	1	KARAN	400	PHYSICS	68	I	2	DIWAKAR	450	COMP Sc	68	I	3	DIVYA	300	CHEMISTRY	62	I	4	REKHA	350	PHYSICS	63	I	5	ARJUN	500	MATHS	70	I	6	SABINA	400	CHEMISTRY	55	II	7	JOHN	250	PHYSICS	64	I	8	ROBERT	450	MATHS	68	I	9	RUBINA	500	COMP Sc	62	I	10	VIKAS	400	MATHS	57	II	
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27.	<p>Write a definition of a function calculate () which count the number of digits in a file "ABC.txt".</p> <p style="text-align: center;">OR</p> <p>Write a function count() in Python that counts the number of "the" word present in a text file "STORY.TXT". If the "STORY.TXT" contents are as follows: This is the book I have purchased. Cost of the book was Rs. 320. Then the output will be : 2</p>	3																																																																		
28.	<p>(a)Write the outputs of the SQL queries (i) to (iii) based on the tablesEmp:</p> <table border="1" data-bbox="308 1137 1321 1400"> <thead> <tr> <th>EmpCode</th> <th>Ename</th> <th>Salary</th> <th>JoinDate</th> </tr> </thead> <tbody> <tr><td>E001</td><td>Raman</td><td>55000</td><td>2019-10-11</td></tr> <tr><td>E002</td><td>Neha</td><td>65000</td><td>2019-11-20</td></tr> <tr><td>E003</td><td>Priya</td><td>60000</td><td>2020-01-28</td></tr> <tr><td>E004</td><td>Raghav</td><td>58000</td><td>2020-02-16</td></tr> </tbody> </table> <p>(i) Select ename, salary from emp where name like '_r%' (ii) Select count(salary) from emp where joindate>'2019-11-28' (iii) Select max(joindate), min(joindate) from emp</p> <p>(b) Write the command to list all the databases in MySQL.</p>	EmpCode	Ename	Salary	JoinDate	E001	Raman	55000	2019-10-11	E002	Neha	65000	2019-11-20	E003	Priya	60000	2020-01-28	E004	Raghav	58000	2020-02-16	3																																														
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29.	<p>Write definition of a Method MSEARCH(STATES) to display all the state names from a list of STATES, which are starting with alphabet M. For example: If the list STATES contains["MP","UP","MH","DL","MZ","WB"] The following should get displayed</p> <p style="margin-left: 40px;">MP MH MZ</p>	3																																																																		

30.	<p>Write a function in Python push(S,item), where S is stack and item is element to be inserted in the stack.</p> <p style="text-align: center;">OR</p> <p>Write a function in Python pop(S), where S is a stack implemented by a list of items. The function returns the value deleted from the stack.</p>	3																								
SECTION-D																										
31.	<p>A software organization has to set up its new data center in Chennai. It has four blocks of buildings – A, B, C and D.</p> <table border="1" data-bbox="288 450 767 752"> <thead> <tr> <th colspan="2" style="text-align: left;">Distance Between Blocks</th> </tr> </thead> <tbody> <tr><td>Block A to Block B</td><td>50m</td></tr> <tr><td>Block B to Block C</td><td>150m</td></tr> <tr><td>Block C to Block D</td><td>25m</td></tr> <tr><td>Block A to Block D</td><td>170m</td></tr> <tr><td>Block B to Block D</td><td>125m</td></tr> <tr><td>Block A to Block C</td><td>90m</td></tr> </tbody> </table> <table border="1" data-bbox="900 488 1166 667"> <thead> <tr> <th colspan="2" style="text-align: left;">No. of Computers</th> </tr> </thead> <tbody> <tr><td>Block A</td><td>25</td></tr> <tr><td>Block B</td><td>50</td></tr> <tr><td>Block C</td><td>125</td></tr> <tr><td>Block D</td><td>10</td></tr> </tbody> </table> <p>(i) Suggest a cable layout of connection between the blocks (Diagram). (ii) Suggest the most suitable block to host the server along with the reason. (iii) Where would you place Repeater devices? Answer with justification. (iv) The organization is planning to link its front office situated in the city in a hilly region where cable connection is not feasible, suggest an economic way to connect it with reasonably high speed. (v) Where would you place Hub/Switch? Answer with justification.</p>	Distance Between Blocks		Block A to Block B	50m	Block B to Block C	150m	Block C to Block D	25m	Block A to Block D	170m	Block B to Block D	125m	Block A to Block C	90m	No. of Computers		Block A	25	Block B	50	Block C	125	Block D	10	<p style="text-align: right;">1 1 1 1 1</p>
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32.	<p>(a) Find and write the output of the following python code:</p> <pre>def change(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+'is' print(m) change('kv@onTHEtop')</pre> <p>) 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.</p> <pre>import _____.connector____pymysql dbcon=pymysql._____(host="localhost", user="root", _____="kvs@1234") if dbcon.isconnected()==False print("Error in establishing connection:") cur=dbcon._____()</pre>	2+3																								

	<pre> query="select * from stmaster" cur.execute(_____) resultset=cur.fetchmany(3) for row in resultset: print(row) dbcon._____.close() </pre> <p style="text-align: center;">OR</p> <p>(a) Write output of the following code:</p> <pre> def func(a): s=m=n=0 for i in (0,a): if i%2==0: s=s+i elif i%5==0: m=m+i else: n=n+i print(s,m,n) func(15) </pre> <p>) Avni is trying to connect Python with MySQL for her project. Help her to write the python statement on the following:-</p> <p>(i) Name the library, which should be imported to connect MySQL with Python.</p> <p>(ii) Name the function, used to run SQL query in Python.</p> <p>(iii) Write Python statement of connect function having the arguments values as: Host name :192.168.1.101 User : root Password: Admin Database : KVS</p>	
33.	<p>Divyanshi writing a program to create a csv file "a.csv" which contain user id and name of the beneficiary. She has written the following code. As a programmer help her to successfully execute the program.</p> <pre> import _____ #Line 1 with open('d:\\a.csv','w') as newFile: newFileWriter = csv.writer(newFile) newFileWriter.writerow(['user_id','beneficiary']) newFileWriter._____([[1,'xyz']]) #Line2 newFile.close() with open('d:\\a.csv','r') as newFile: newFileReader = csv._____ (newFile) #Line 3 for row in newFileReader: print (row) #Line 4 newFile._____ #Line 5 </pre> <p>a) Name the module he should import in Line 1 b) Fill in the blank in line 2 to write the row.</p>	5

	<p>c) Fill in the blank in line 3 to read the data from csv file. d) Write the output while line 4 is executed. e) Fill in the blank in line 5 to close the file.</p> <p style="text-align: center;">OR</p> <p>ANSHU 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.</p> <pre>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</pre> <p>(a) Name the module he should import in Statement 1. (b) In which mode, MOHIT 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.</p>																													
SECTION-E																														
34.	<p>Dinesh creates a table COMPANY with a set of 06 records.</p> <table border="1" data-bbox="359 1048 1268 1294" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>C_ID</th> <th>F_ID</th> <th>Cname</th> <th>Fees</th> </tr> </thead> <tbody> <tr> <td>C21</td> <td>102</td> <td>Grid Computing</td> <td>40000</td> </tr> <tr> <td>C22</td> <td>106</td> <td>System Design</td> <td>16000</td> </tr> <tr> <td>C23</td> <td>104</td> <td>Computer Security</td> <td>8000</td> </tr> <tr> <td>C24</td> <td>106</td> <td>Human Biology</td> <td>15000</td> </tr> <tr> <td>C25</td> <td>102</td> <td>Computer Network</td> <td>20000</td> </tr> <tr> <td>C26</td> <td>105</td> <td>Visual Basic</td> <td>6000</td> </tr> </tbody> </table> <p>Based on the data given above answer the following questions: (a) Identify the most appropriate column, which can be considered as Primary key. (b) If 3 columns are added and 2 rows are deleted from the table result, what will be the new degree and cardinality of the above table? (c) Write the statements to: (i) delete a record which has C_ID as C24 (ii) Increase the Fee of all by 500.</p> <p style="text-align: center;">OR (Option for part (C) only)</p> <p>(i) Add a column PLACE in the table with datatype as varchar with 20 Characters. (ii) Query to display all the records.</p>	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	1+1+2
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C24	106	Human Biology	15000																											
C25	102	Computer Network	20000																											
C26	105	Visual Basic	6000																											

35.	<p>(a) What is the difference between 'w' and 'a' modes? Anshuman is a Python learner, who has assigned a task to write python Codes to perform the following operations on binary files. Help him in writing codes to perform following tasks (b) & (c):</p> <p>(b) Write a statement to open a binary file named SCHOOL.DAT in read mode. The fileSCHOOL.DAT is placed in D: drive.</p> <p>(c) Consider a binary file “employee.dat” containing details such as empno:ename:salary (separator ':'). Write a python function to display details of those employees who are earning between 20000 and 30000 (both values inclusive).</p>	1+1+2
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Class: XII Session: 2022-23
Marking Scheme Practice Paper-3

SECTION A		
1.	<p style="text-align: center;">floor () ----- math</p> <p>a. randomint () ---- random</p>	1
2.	import or from import	1
3.	Key:- Rohan, Values :- "Manager":427, "SBI", 05884	1
4.	c) ==	1
5.	Output: 7	1
6.	(b) fp.tell()	1
7.	b. Group by	1
8.	Distinct	1
9.	(c) 50	1
10.	(c) Cardinality	1
11.	(d) f= open("Students.txt", 'A')	
12.	b.HAVING	
13.	a. PPP- Point to Point Protocol b. VOIP -Voice over Internet Protocol	
14.	(20, 22)	
15.	(c) JOIN	1
16.	mysql.connector	1
17.	(e) Both A and R are true and R is not the correct explanation for A	1
18.	(b) Both A and R are true and R is not the correct explanation for A	1
SECTION B		
19.	<pre>Marks=int(input("enter marks")) temperature = int(input("enter temperature")) if marks < 80 and temperature >= 40: print("Not Good") else: print("OK")</pre>	2
20.	<p>Web hosting is a service that allows us to put a website or a web page onto the Internet, and make it a part of the World Wide Web. Once a website is created, we need to connect it to the Internet so that users across the globe can access.</p> <p style="text-align: center;">OR</p> <p>TCP breaks the message into packets and IP decides the destination address for packets .</p>	2

21.	a) Ans: 9 b) Ans: True	1 1
22.	Constraints are the rules enforced on data or columns on a table. These are used to restrict the values that can be inserted in a table. (a) NOT NULL Constraint (b) UNIQUE Constraint (c) PRIMARY Key (d) CHECK Constraint	2
23.	a. Personal Area Network b. Hyper Text Markup Language c. Uniform Resource Locator d. Post office Protocol	2
24.	2 4 6 5 OR 47.0 35.0 54.0 26.0	2
25	a. Display the structure of table (DDL or DML) Ans: desc student ---- DML b. Increase the size of column FeeAmount by 5 (DDL or DML) Ans: alter table student modify FeeAmount(7) ---- DDL OR char(n): stores a fixed length string between 1 and 255 Characters if the value is of smaller length, adds blank spaces some space is wasted varchar(n): stores a variable length string no blanks are added even if value is of smaller length no wastage of space	2
26.	(a) degree=4 , cardinality=5 (b) (i) 63 (ii) 800 (iii) 475 (iv) 4	1+2
27.	myfile=open("peom.txt","r") count=0 for line in myfile: words=line.split() for i in words: for letter in i: if(letter.isdigit()): count=count+1 print(letter) print("total digits ", count) myfile.close() OR	

	<pre> myfile=open("story.txt","r") # file story.txt is opened count=0 line=myfile.read() word=line.split() for i in word: if i=="the" or "The" or "THE": count=count+1 print("total count= ",count) myfile.close() </pre>											
28.	<p>a. (i) Select ename, salary from emp where name like '%r%'</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Ename</th> <th>Salary</th> </tr> </thead> <tbody> <tr> <td>Priya</td> <td>60000</td> </tr> </tbody> </table> <p>(ii) Select count(salary) from emp where joindate>'2019-11-28'</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Count(salary)</th> </tr> </thead> <tbody> <tr> <td>4</td> </tr> </tbody> </table> <p>(iii) Select max(joindate), min(joindate) from emp</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>max(joindate)</th> <th>min(joindate)</th> </tr> </thead> <tbody> <tr> <td>2020-02-16</td> <td>2019-10-11</td> </tr> </tbody> </table> <p>(b) Show databases;</p>	Ename	Salary	Priya	60000	Count(salary)	4	max(joindate)	min(joindate)	2020-02-16	2019-10-11	
Ename	Salary											
Priya	60000											
Count(salary)												
4												
max(joindate)	min(joindate)											
2020-02-16	2019-10-11											
29.	<pre> def MSEARCH(STATES): for i in STATES: if i[0]=='M': print(i) </pre>											
30.	<pre> def push(s,a): s.append(a) return(s) OR def pop(s): a=s.pop() print("deleted item= ",a) return(s) </pre>	3										
<u>SECTION-D</u>												
31.	<p>(i) (1 Mark for any of the above layouts)</p> <p>(ii) The most suitable place / block to house the server of this organisation would be Block C, as this block contains the maximum number of computers. Placing the server in Block C will reduce the external traffic.</p> <p>(iii) Repeater is to be placed between buildings where the distance is quite large (in layouts)</p> <p>(iv).The most economic way to connect it with a reasonable high speed</p>											

	would beto use radio wave transmission, as they are easy to install, can travel long distances, are omni-directional and can penetrate buildings easily. (v).Hub/Switch is to placed inside every block for internal connectivity among computers.	
32.	<p>(a) KVisONtheTOP</p> <pre>(b) import <u>mysql.connector</u> as <u>pymysql</u> dbcon=<u>pymysql.connector</u>(host="localhost", user="root", <u>passwd</u>="kvs@1234") if dbcon.isconnected()==False print("Error in establishing connection:") cur=dbcon.<u>cursor</u>() query="select * from stmaster" cur.execute(<u>query</u>) resultset=cur.fetchmany(3) for row in resultset: print(row) dbcon.<u>close</u>()</pre> <p style="text-align: center;">OR</p> <p>(a) 0 15 0</p> <p>(b) (i) import mysql.connector (ii) execute (<sql query >) (iii)mysql.connector.connect(host="192.168.1.101",user="root",passwd="Admin",datababase="KVS")</p>	2+3=5
33.	<p>(a) import csv (b) newFileWriter.writerow([1,'xyz']) (c) newFileReader = csv.reader(newFile) b) User_Id Beneficiary 1 xyz (d) newFile.close()</p> <p style="text-align: center;">OR</p> <p>(a) csv (b) "r" (c) data=csv.reader(f) (d) f.close() (e) Comma Separated Values</p>	5
34.	<p>(a) C_ID (b) degree =7 and cardinality=4 (c) (i) DELETE FROM COMPANY WHERE C_ID= C24; (ii) UPDATE COMPANY SET Fees=Fees+500;</p> <p style="text-align: center;">OR</p> <p>(i) ALTER TABLE COMPANY ADD(PLACE Varchar(20)); (ii) SELECT * FROM COMPANY;</p>	1+1+2

35.	<p>(a) "w" mode opens a file for writing only. it overwrites if file already exist but "a" mode appends the existing file from end. It does not overwrites the file.</p> <p>(b) f=open("D:\ SCHOOL.DAT",'r')</p> <p>(c) def Readfile(): i=open("Employee.dat" , "rb+") x=i.readline() while(x): l= x.split(':') if ((float (l[2]) >=20000) and (float l[2])<=40000):print(x) x= i.readline()</p>	1+1+2
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Class: XII Session: 2022-23
Computer Science (083)
Practice Paper - 4

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 "Name of Variable come always after the assignment operator in python.	1
2.	Which of the following is valid datatype in Python? (a) tuple (b) None (c) float (d) All the options	1
3.	Give the output: dic1={'r': 'red', 'g': 'green', 'b': 'blue'} for i in dic1: print (i,end="") a. rgb b. RGB c. RBG d. rbg	1
4.	Consider the given expression: not True or False and True Which of the following will be correct output if the given expression is evaluated? (a) True (b) False (c) NONE (d) NULL	1
5.	Select the correct output of the code: a = "Year 3033 at All the best" a = a.split('3') b = a[0] + "." + a[1] + "." + a[2] print (b) (a) Year . 0. at All the best (b) Year 0. at All the best (c) Year . 0. (d) Year . 0. all the best	1

6.	Which of the following mode, file should be open if we want to add new contents in in existing file contents? (a) a (b) r (c) w (d) None of the above	1
7.	Fill in the blank: _____command is used to remove the tuple from the table in SQL. (a) update (b)remove (c) alter (d) delete	1
8.	Which of the following commands will show the structure of table from MYSQL database? (a) SHOW TABLES (b) DISPLAY TABLES (c) DESCRIBE TABLE-NAME (d) ALTER TABLE	1
9.	Which of the following statement(s) would give an error after executing the following code? S="Welcome to KVS" # Statement 1 print(S) # Statement 2 S="Thank you" # Statement 3 S[0]= '\$' # Statement 4 S=S+"Thank you" # Statement 5 (a) Statement 3 (b) Statement 4 (c) Statement 5 (d) Statement 4 and 5	1
10.	Fill in the blank: _____is a non-key attribute, which gives referential integrity concept in two tables. (a) Primary Key (b) Foreign Key (c) Candidate Key (d) Alternate Key	1
11	Which method is used to move the file pointer to a specified position. (a) tell() (b) seek() (c) seekg() (d) tellg()	
12	Fill in the blank: The SELECT statement when combined with_____clause, returns records with repetition. (a) DESCRIBE (b) ALL (c) DISTINCT (d) NULL	
13	Fill in the blank: _____is a communication methodology designed to deliver emails over Internet protocol. (a) VoIP (b) SMTP (c) PPP (d)HTTP	

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 function is an invalid multiple row function? (a) sum() (b) total() (c) count(*) (d) avg()	1
16.	Which function should be used to display the number of records as per need of a user during interface with python and SQL database. (a) fetchone() (b) fetchmany() (c) fetchall() (d) fetchshow()	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): A function is block of organized and reusable code that is used to perform a single, related action. Reasoning (R):- Function provides better modularity for your application and a high degree of code reusability.	1
18.	Assertion (A): Access mode 'a' opens a file for appending. Reason (R): The file pointer is at the end of the file if the file exists.	1
SECTION-B		
19	Harsh has written a code to input a number and find a table of any number.His code is having errors. Rewrite the correct code and underline the corrections made. def table(): n=int(("Enter number which table U need: ")) for i in (1,11): print("Table of Enter no=",i*i) Table()	
20	Identify the switching technique according to the given statement. (i) A methodology of implementing a telecommunication network in which two network nodes establish a dedicated communication channel. (ii) the message gets broken into small data packets and Store and forward technique used. OR What is web browser? Give any two examples of it which you used in your life.	
21.	(a) Given is a Python string declaration: myexam="##CBSE Examination 2023@@" Write the output of: print(myexam[::-3])	1

	<p>(b) Write the output of the code given below:</p> <pre>my_dict = {"name": "Aman", "age": 26} my_dict['age'] = 27 my_dict['address'] = "Delhi" print(my_dict.values())</pre>	1
22	<p>Explain the use of 'Primary Key' in a Relational Database Management System. Give example to support your answer.</p>	
23.	<p>(a) Write the full forms of the following: (i) VoIP (ii) TCP/IP</p> <p>(b) If we want to access remote computer than which command should be used in networking?</p>	2
24.	<p>Predict the output of the Python code given below:</p> <pre>def Diff(N1,N2): if N1<N2: return N1-N2 else: return N2*N1 NUM= [10,23,14,54,32] for CNT in range (4,0,-1): A=NUM[CNT] B=NUM[CNT-1] print(Diff(A,B),'#', end=' ')</pre> <p style="text-align: center;">OR</p> <p>Predict the output of the Python code given below:</p> <pre>tuple1 = (1, 11, 22, 33, 44 ,55) list1 =list(tuple1) new_list = [] for i in list1: if i%3==0: new_list.append(i) new_tuple = tuple(new_list) print(new_tuple)</pre>	2
25.	<p>Differentiate between count() and count(*) functions in SQL with appropriate example.</p> <p style="text-align: center;">OR</p> <p>Categorize the following commands as DDL or DML:INSERT, ALTER, DROP, DELETE,UPDATE,CREATE</p>	2

26 (a) Consider the following tables – LOAN_Account and Branch:

Table: Bank_Account

ACode	Name	Type
A01	Amrita	Savings
A02	Parthodas	Current
A03	Miraben	Current

Table: Branch

ACode	City
A01	Delhi
A02	Mumbai

What will be the output of the following statement?

SELECT * FROM LOAN_Account JOIN Branch;

(b) Write the output of the queries (i) to (iv) based on the table,COURSE given below:

Table: COURSE

CID	CNAME	FEES	STARTDATE	TID
C201	Animation and VFX	12000	2022-07-02	101
C202	CADD	15000	2021-11-15	NULL
C203	DCA	10000	2020-10-01	102
C204	DDTP	9000	2021-09-15	104
C205	Mobile Application	18000	2022-11-01	101
C206	Digital marketing	16000	2022-07-25	103

- i. SELECT ALL TID FROM COURSE;
- ii. SELECT TID, COUNT(), MAX(FEES) FROM COURSE GROUP BY TID HAVING COUNT(TID)>1;
- iii. SELECT CNAME FROM COURSE WHEREFEES>15000 ORDER BY CNAME DESC;
- iv. SELECT SUM(FEES) FROM COURSE WHERE FEES BETWEEN 15000 AND 17000;

27. Write a method COUNTWORDS() in Python to read words from text file 'TEST.TXT' and display the words which are not starting with d.

Example:

If the file content is as follows:

An apple a day keeps the doctor away.

We all pray for everyone's safety.

A marked difference will come in our country.

The COUNTWORDS() function should display the output as:

The number of words not starting with d:-19

OR

Write a function Count() in Python, which should read those lines which start with 'I' or 'i' of a text file "TEST.TXT" and then count and display the no of liens which start with 'I' or 'i' (including small cases I and i too).

Example:

If the file content is as follows:

Today is a pleasant day.It

might rain today.

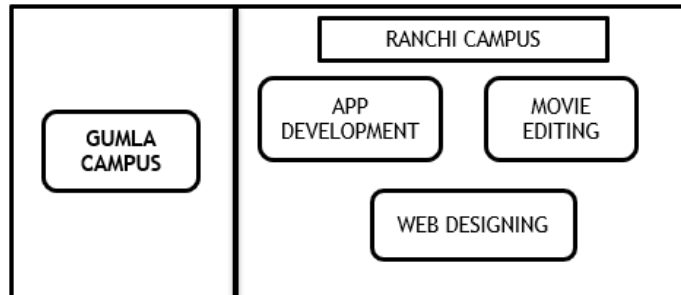
it is mentioned on weather sites

3

	The Count() function should display the output as: It might rain today. it is mentioned on weather sites I or i: 2																																					
28	<p>Write SQL commands for (i) to (vi) on the basis of table STUDENT:</p> <p style="text-align: center;">Table : STUDENT</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>ADMNO</th> <th>NAME</th> <th>STREAM</th> <th>FEES</th> <th>AGE</th> <th>SEX</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>RAEESH</td> <td>SCIENCE</td> <td>3000</td> <td>15</td> <td>MALE</td> </tr> <tr> <td>2</td> <td>SATISH</td> <td>ARTS</td> <td>2000</td> <td>14</td> <td>MALE</td> </tr> <tr> <td>3</td> <td>SUMAN</td> <td>SCIENCE</td> <td>4000</td> <td>14</td> <td>FEMALE</td> </tr> <tr> <td>4</td> <td>SURYA</td> <td>COMMERCE</td> <td>2500</td> <td>13</td> <td>FEMALE</td> </tr> <tr> <td>5</td> <td>SURESH</td> <td>ARTS</td> <td>2000</td> <td>13</td> <td>MALE</td> </tr> </tbody> </table> <p>(i) List the name of all the students, who have taken stream as science. (ii) To count the number of female students. (iii) To display the number of students, stream wise. (iv) To display all the records in sorted order of name. (v) To display the stream of student whose name start from 's'. (vi) To display the name and fees of students whose fees range from 3000 to 4000(both values of fees included)</p>	ADMNO	NAME	STREAM	FEES	AGE	SEX	1	RAEESH	SCIENCE	3000	15	MALE	2	SATISH	ARTS	2000	14	MALE	3	SUMAN	SCIENCE	4000	14	FEMALE	4	SURYA	COMMERCE	2500	13	FEMALE	5	SURESH	ARTS	2000	13	MALE	
ADMNO	NAME	STREAM	FEES	AGE	SEX																																	
1	RAEESH	SCIENCE	3000	15	MALE																																	
2	SATISH	ARTS	2000	14	MALE																																	
3	SUMAN	SCIENCE	4000	14	FEMALE																																	
4	SURYA	COMMERCE	2500	13	FEMALE																																	
5	SURESH	ARTS	2000	13	MALE																																	
29	<p>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]</p>																																					
30	<p>ICCI has created a dictionary containing top players and their runs as key value pairs of cricket team. Write a program, with separate user defined functions to perform the following operations: Push the keys (name of the players) of the dictionary into a stack, where the corresponding value (runs) is greater than 50.Pop and display the content of the stack. For example: If the sample content of the dictionary is as follows: SCORE={"KAPIL":40, "SACHIN":55, "SAURAV":80, "RAHUL":35, "YUVRAJ":110, } The output from the program should be: SACHIN SAURAV YUVRAJ</p> <p style="text-align: center;">OR</p> <p>Vikram has a list containing 10 integers. You need to help him create a program with separate user defined functions to perform the following operations based on this list. Traverse the content of the list and push the ODD numbers into a stack. Pop and display the content of the stack. For Example: If the sample Content of the list is as follows: N=[14, 15, 34, 56, 21, 79, 98, 22, 35, 38] Sample Output of the code should be: 15,21,79,35</p>																																					
Section- D																																						
31	<p>StartIndia Corporation, an Jharkhand based IT training company, is planning to set up training centers in various cities in next 2 years. Their first campus is coming up in Ranchi district. At Ranchi campus, they are planning to have 3 different blocks for App development, Web designing</p>																																					

and Movie editing. Each block has number of computers, which are required to be connected in a network for communication, data and resource sharing. As a network consultant of this company, you have to suggest the best network related solutions for them for issues/problems raised in question nos.

(i) to (v), keeping in mind the distances between various blocks/locations and other given parameters.



Distance between various blocks/locations:

Block	Distance
App development to Web designing	38 m
App development to Movie editing	105 m
Web designing to Movie editing	42 m
Ranchi Campus to Gumla Campus	232 km

Number of computers:

Block	Number of Computers
App development	65
Web designing	40
Movie editing	70

- (i) Suggest the most appropriate block/location to house the SERVER in the Ranchi campus (out of the 3 blocks) to get the best and effective connectivity. Justify your answer.
- (ii) Suggest a device/software to be installed in the Ranchi Campus to take care of data security.
- (iii) Suggest the best wired medium and draw the cable layout (Block to Block) to economically connect various blocks within the Ranchi Campus.
- (iv) Suggest the placement of the following devices with appropriate reasons:
 - a. Switch / Hub
 - b. Repeater
- (v) Suggest a protocol that shall be needed to provide Video Conferencing solution between Ranchi Campus and Gumla Campus.

32 (a) Write the output of the code given below:

```
p=7
def add(q,r=3):
    global p
    p=r+q**2
    print(p, end= '#')
```

```
a=10
b=5
add(a,b)
add(r=5,q=1)
```

(b) The code given below inserts the following record in the table Student:

```
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.
- 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 connection

Statement 2 - to form the cursor object

Statement 3 - to execute the command that inserts the record in the table Student.

```
import mysql.connector as mysql
def sql_data():
    con1=....._(host="localhost",user="root", password="tiger",
    database="school")                #Statement 1
    mycursor=.....                #Statement 2
    rno=int(input("Enter Roll Number :: "))
    name=input("Enter name :: ")
    clas=int(input("Enter class :: "))
    marks=int(input("Enter Marks :: "))
    query="insert into student values({},'{}',{},{})".format (rno,name,clas,marks)
    .....                #Statement 3
    print("Data Added successfully")
```

OR

(a) Predict the output of the code given below:

```
Name="PythoN3.1"
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()
    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

	<p>or equal to 90: RollNo – integer Name – string Clas – integer Marks – integer</p> <p>Note the following to establish connectivity between Python and MYSQL:</p> <ul style="list-style-type: none"> • Username is root • Password is tiger • The table exists in a MYSQL database named school. <p>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 less than or equal to 90. Statement 3- to read the complete result of the query (records whose marks are less than or equal to 90) into the object named data, from the table studentin the database.</p> <pre>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 less than or equal to 90 are :") #Statement 2 data=_____ #Statement 3 for i in data: print(i)</pre>	
33	<p>Abhisar is making a software on “Countries & their Capitals” in which Various records are to be stored/retrieved in CAPITAL.CSV data file. consists some records(Country & Capital). He has written the followin code in python. As a programmer, you have to help him to successfully execute the program.</p> <pre>import_____ # Statement-1 def AddNewRec(Country,Capital): # Fn. to add a new record in CSV file f=open(“CAPITAL.CSV”,) # Statement-2 fwriter=csv.writer(f) fwriter.writerow([Country,Capital]) f._____ # Statement-3 def ShowRec(): # Fn. to display all records from CSV file with open(“CAPITAL.CSV”,“r”) as NF: NewReader=csv._____(NF)# Statement-4 for rec in NewReader: print(rec[0],rec[1]) AddNewRec(“INDIA”,“NEW DELHI”) AddNewRec(“CHINA”,“BEIJING”) ShowRec() # Statement-5</pre> <p>(a) Name the module to be imported in Statement-1. (b) Write the file mode to be passed to add new record in Statement-2.</p>	

- (c) Fill in the blank in Statement-3 to close the file.
 (d) Fill in the blank in Statement-4 to read the data from a csv file.
 (e) Write the output which will come after executing Statement-5.

OR

Give any one point of difference between a binary file and a csv file. 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 'empdata.csv'. Each record consists of a list with field elements as eid, ename and esalary to store emp id, emp name and esalary respectively.
 (ii) search()- To display the records of the emp whose salary is less than 70000.

SECTION-E

34 Pardeep creates a table STORE with a set of records to maintain the Watch details. After creation of the table, he has entered data of 5 watch information in the table.

Watchid	Watch_Name	Price	Type	Qty	Brand
W001	High Time	10000	Unisex	100	Titan
W002	Life Time	15000	Ladies	150	John player
W003	Wave	20000	Gents	200	Citizen
W004	High Fashin	7000	Unisex	250	Sony
W005	Golden Time	25000	Gents	100	Rado

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 deleted and 2 rows added from the table store 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
 Watchid-W006, Watchname-Prime Time, Price-12000, Type-Ladies, Qty-120, Company-Samsung
 (b) Increase the price by 5000 of those watch whose brand is rado.

OR(Option for part iii only)

- (a) Delete the record of watches whose Type as Unisex.
 (b) To add an column Wdiam in table store with datatype as int.

35 (i) Why we need a binary file?
 (ii) A binary file named "TEST.dat" has some records of the structure [TestId, Subject, MaxMarks, ScoredMarks]
 Write a function in Python named Display AvgMarks(Sub) that will accept a subject as an argument and read the contents of TEST.dat.
 The function will calculate & display the Average of the ScoredMarks of the passed Subject on screen.

Class: XII Session: 2022-23
Marking Scheme Practice Paper-4

- | | |
|--|---------|
| 1. FALSE | MARKS-1 |
| 2. (D)- ALL THE OPTIONS | MARKS-1 |
| 3. (A) rgb | MARKS-1 |
| 4. (B) FALSE | MARKS-1 |
| 5. (C) Year . 0. | MARKS-1 |
| 6. (A) a | MARKS-1 |
| 7. (D) DELETE | MARKS-1 |
| 8. (C) DESCRIBE TABLE NAME | MARKS-1 |
| 9. (B) STATEMENT-4 | MARKS-1 |
| 10. (B) FOREIGN KEY | MARKS-1 |
| 11. (B) SEEK | MARKS-1 |
| 12. (B) ALL | MARKS-1 |
| 13. (B) SMTP | MARKS-1 |
| 14. (B) 14.0 | MARKS-1 |
| 15. (B) TOTAL() | MARKS-1 |
| 16. (B) FETCHMANY() | MARKS-1 |
| 17. (A) Both A and R are true and R is the correct explanation for A | MARKS-1 |
| 18. (A) Both A and R are true and R is the correct explanation for A | MARKS-1 |

SECTION-B

19. def table(): MARKS-1/2
 Each
 n=int(input("Enter number which table U need: "))
 for i in range(1,11):
 print("able of Enter no=",i*n)
 table()

20. (i) CIRCUIT SWITCHING (ii) PACKET SWITCHING MARKS-1 Each
 OR

Web browser: Web browser is a software which will help to access the web page/web-site

Example:- Mozilla fire fox and internet explorer etc.

- | | |
|---|----------------|
| 21. (A) THE OUTPUT WILL BE- @2 ina B# | MARKS-1 |
| (B) THE OUTPUT WILL BE- dict_values(['Aman', 27, 'Delhi']) | MARKS-1 |
| 22. Primary Key gives unique row values from given relation and as constraint it removed delicacy of data as input. | MARKS-1 Each |
| 23. (A)Full Form: VoIP:- Voice over internet protocol
TCP/IP :- Transmission control Protocol/Internet protocol. | MARKS-1/2 Each |
| (B) TELNET Command | MARKS-1 |
| 24. OUTPUT: -22 # 756 # -9 # 230 # | MARKS-2 |

OR

- OUTPUT:- (33,)
 25 count():- It will count the values of attribute without empty values MARKS-1 Each
 Count*():- It will count the values of attribute with empty values

OR

DDL: ALTER,DROP,CREATE and DML: INSERT,DELETE,UPDATE MARKS-1 Each

SECTION-C

26. (A) MARKS-1

Acode	Name	Type	Acode	City
A01	Amrita	Saving	A01	Delhi
A01	Amrita	Saving	A02	Mumbai

A02	Parthodas	Current	A01	Delhi
A02	Parthodas	Current	A02	Mumbai
A03	Miraben	Current	A01	Delhi
A03	Miraben	Current	A02	Mumbai

(B) (i) (ii) MARKS: ½ Each

```
TID TID COUNT() MAX(FEES)
101 101 2 18000
NULL
102
104
103
```

(iii) CNAME: Mobile Application, Development Digital marketing

(iv) SUM(FEES) :- 49000

```
27. def COUNTWORDS():
    file = open ('test.txt', 'r')
    lines = file.read()
    data=lines.split()
    count=0
    for w in data :
        if (w[0]).lower() not in 'd':
            count = count + 1
    print ("The number of lines not starting with : ", count)
    file.close()
COUNTWORDS()
```

OR

```
def COUNT():
    file = open ('TEST.txt', 'r')
    lines = file.readlines()
    count=0
    for w in lines :
        if (w[0])== 'I' or (w[0])== 'i':
            count = count + 1
    print ("The number of lines starting with I or i : ", count)
    file.close()
COUNT()
```

28. (I) SELECT NAME FROM STUDENT WHERE STREAM="SCIENCE";
 (II) SELECT COUNT(*) FROM STUDENT WHERE SEX='FEMALE';
 (III) SELECT COUNT(*) FROM STUDENT GROUP BY STREAM;
 (IV) SELECT * FROM STUDENT ORDER BY NAME ASC;
 (V) SELECT STREAM FROM STUDENT WHERE STREAM LIKE "S%";
 (VI) SELECT NAME,FEES FROM STUDENT WHERE FEES BETWEEN 3000 AND 4000;

OR

SELECT NAME,FEES FROM STUDENT WHERE FEES >= 3000 AND FEES<=4000;

29. L=[10,20,30,40,12,11]
 m=2
 def Lshift(Arr,n):
 L=len(Arr)
 for x in range(0,n):
 y=Arr[x]
 for i in range(0,L-1):
 Arr[i]=Arr[i+1]
 Arr[L-1]=y

```

    print(Arr)
    Lshift(L,m)
30. SCORE={"KAPIL":40, "SACHIN":55,"SAURAV":80, "RAHUL":35, "YUVRAJ":110,}
    def PUSH(S,R):
        S.append(R)
    def POP(S):
        if S!=[]:
            return S.pop()
        else:
            return None
    ST=[]
    for k in SCORE:
        if SCORE[k]>50:
            PUSH(ST,k)
    while True:
        if ST!=[]:
            print(POP(ST),end=" ")
        else:
            break

```

OR

```

N=[14, 15, 34, 56, 21, 79, 98, 22, 35, 38]
def PUSH(S,N):
    S.append(N)
def POP(S):
    if S!=[]:
        return S.pop()
    else:
        return None
ST=[]
for k in N:
    if(k%2!=0):
        PUSH(ST,k)
    while True:
        if ST!=[]:
            print(POP(ST),end="")
        else:
            break

```

31. (i) Movie editing block is the most appropriate to house the server as it has the maximum number

of computers.

(ii) Firewall

(iii) Ethernet Cable:

(iv) Switch/hub will be placed in all blocks to have connectivity within the block.

Repeater is required between the blocks as the distance is more than 100 mts.

(v) Protocol: VoIP

32. (a) The output :- 105#6#

(b) Statement 1: mysql.connect()

Statement 2: con1.cursor()

Statement 3: mycursor.execute(querrey)

OR

(a) pYTHOnN#.

(b) Statement 1: con1.cursor()

Statement 2: mycursor.execute("select * from student where Marks>=90")

Statement 3: mycursor.fetchall()
 33. Statement-1:- csv module Statement-2:- 'a' -append mode.
 Statement-3:- f.close() Statement4: reader()
 Statement-5:- INDIA NEW DELHI
 CHINA BEIJING

OR

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

```
import csv
def add():
    fout=open("furdata.csv","a",newline='\n')
    wr=csv.writer(fout)
    ed=int(input("Enter Furniture Id :: "))
    ename=input("Enter Furniture name :: ")
    esalary=int(input("Enter price :: "))
    FD=[eid,ename,esalary]
    wr.writerow(FD)
    fout.close()
add()

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])<70000:
            found=True
            print(i[0],i[1],i[2])
    if found==False:
        print("Record not found")
    fin.close()
    print("Now displaying")
search()
```

34. (i) Most appropriate column as primary key: Watchid
 (ii) After deleted 2 columns and 2 row new degree-4 and cardinality-7
 (iii) (a) INSERT INTO STORE VALUES('W006','Prime Time',12000,'Ladies',120)
 (b) UPDATE STORE SET PRICE=PRICE+5000 WHERE BRAND='RADO';

OR

(a) DELETE FROM STORE WHERE TYPE=UNISEX;
 (b) ALTER TABLE STORE ADD Wdiam int;

35. (a) Binary file should be use when we want to read images, audio, video pdf files or we
 Can say non-human readable codes.

```
(b) def DisplayAvgMarks(sub):
    f=open("TEST.dat","rb")
    count=0
    sum=0
    try:
        while True:
            pos=f.tell()
            rec=pickle.load(f)
            if rec[1]==sub:
                sum+=rec[3]
                count+=1
    except:
        f.close()
    print("AVG Marks:",sum/count)
```

DisplayAvgMarks(sub)

Class: XII Session: 2022-23
Computer Science (083)
Practice Paper -5

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 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 Q35 against part c only.

SECTION-A		
Q. No.	Question	Marks
1.	State True or False "continue keyword skips remaining part of an iteration in a loop"	1
2.	Which of the following is an invalid operator in Python? (a) == (b) ** (c) += (d)=-	1
3.	Given the following dictionaries dict_fruit={"Kiwi":"Brown", "Cherry":"Red"} dict_vegetable={"Tomato":"Red", "Brinjal":"Purple"} Which statement will merge the contents of both dictionaries? a. dict_fruit.update(dict_vegetable) b. dict_fruit + dict_vegetable c. dict_fruit.add(dict_vegetable) d. dict_fruit.merge(dict_vegetable)	1
4.	Consider the given expression: not False and False or True Which of the following will be correct output if the given expression is evaluated? a. True b.False c. NONE d. NULL	1
5.	Select the correct output of the code: a = "Python! is amazing!" a = a.split('!') b = a[0] + "." + a[1] + "." + a[2] print (b) (a) Python!. is amazing!. (b) Python. is amazing. (c) Python. ! is amazing.! (d) will show error	1
6.	Which of the following mode in file opening statement do not overwrite the existing content? (a) a+ (b) r+ (c) w+ (d) None of the above	1
7.	Fill in the blank: _____command is used to delete the table from the database of SQL. (a) update (b)remove (c) alter (d) drop	1
8.	Which of the following commands will use to change the structure of table in MYSQL database? (a) DELETE TABLE (C)DROP TABLE	1

	(b) REMOVE TABLE (d)ALTER TABLE	
9.	<p>Which of the following statement(s) would give an error after executing the following code?</p> <pre>Q="Humanity is the best quality" # Statemen1 print(Q) # Statemen2 Q="Indeed. # Statement3 Q[0]= '#' # Statement4 Q=Q+"It is." # Statement5</pre> <p>(a) Statement 3 (b) Statement 4 (c) Statement 5 (d) Statement 4 and 5</p>	1
10.	<p>Fill in the blank: _____ is a non-key attribute, , used for referential integrity in the database of MYSQL..</p> <p>(a) Primary Key (b) Foreign Key (c) Candidate Key (d) (d) Alternate Key</p>	1
11.	<p>The tell() function returns:</p> <p>(a) Number of bytes remaining to be read from the file (b) Number of bytes already read from the file (c) Number of the byte written to the file (d) Total number of bytes in the file</p>	1
12.	<p>Fill in the blank: The SELECT statement when combined with _____ function, returns number of rows present in the table.</p> <p>(a) DISTINCT (b) UNIQUE (c) COUNT (d) AVG</p>	1
13.	<p>Fill in the blank: _____ is a communication protocol responsible to control the transmission of data over a network.</p> <p>(a) TCP (b) SMTP (c) PPP (d)HTTP</p>	1
14.	<p>What will the following expression be evaluated to in Python?</p> <pre>print(21.5 // 4 + (8 + 3.0))</pre> <p>(a) 16 (b)14.0 (c) 15 (d) 15.5</p>	1
15.	<p>Which function is used to display the unique values of a column of a table?</p> <p>(a) sum() (b) unique() (c) distinct() (d) return()</p>	1
16.	<p>To establish a connection between Python and SQL database, connect() is used. Which of the following value can be given to the keyword argument - host, while calling connect ()?</p> <p>(a) localhost (b) 127.0.0.1 (c) any one of (a) or (b) (d) localmachine</p>	1

<p>Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as</p> <p>(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</p>		
17.	<p>Assertion (A):- If the arguments in function call statement are provided in the format parameter=argument, it is called keyword arguments. Reasoning (R):- During a function call, the argument list first contain keyword argument(s) followed by positional argument(s).</p>	1
18.	<p>Assertion (A): CSV (Comma Separated Values) is a file format for data storage with one record on each line and each field is separated by comma. Reason (R): The format is used to share data between cross platform as text editors are available on all platforms.</p>	1
SECTION-B		
19.	<p>Observe the following Python code very carefully and rewrite it after removing all syntactical errors with each correction underlined.</p> <pre>import math x = input("Enter a number:") if (abs(x)= x): print("You entered a positive number") else: x=-1 print("Number made positive : ",x)</pre>	2
20.	<p>Write two differences between Coaxial and Fiber transmission media.</p> <p style="text-align: center;">OR</p> <p>Write components of data communication.</p>	2
21.	<p>(a) Given is a Python string declaration: message="Bring it on!!!" Write the output of: print(message[::-2])</p> <p>(b) Write the output of the code given below: book_dict = {"title": "You can win", "copies":15} book_dict['author'] = "Shiv Khera" book_dict['genre'] = "Motivation" print(book_dict.items())</p>	1 1
22.	<p>Explain the use of GROUP BY clause in a Relational Database Management System. Give example to support your answer.</p>	2
23.	<p>(a) Write the full forms of the following: (i) HTTP (ii) IP (b) What is the use of TELNET?</p>	2
24.	<p>Predict the output of the Python code given below:</p> <pre>def Swap (a,b) : if a>b: print("changed ",end="") return b,a else: print("unchanged ",end="") return a,b data=[11,22,16,50,30] for i in range (4,0,-1): print(Swap(data[i],data[i-1]))</pre> <p style="text-align: center;">OR</p>	2

	<p>Predict the output of the Python code given below: P = (10, 20, 30, 40, 50, 60, 70, 80, 90) Q = list(P) R = [] for i in Q: if i%3==0: R.append(i) R = tuple(R) print(R)</p>																																																													
25.	<p>Differentiate between Where and Having clause in SQL. OR Define DDL AND DML and give 2-examples for each.</p>	2																																																												
SECTION-C																																																														
26.	<p>(a) Consider the following tables – Employee and Office: Table: Employee</p> <table border="1"> <thead> <tr> <th>Emp_Id</th> <th>Name</th> <th>Salary</th> </tr> </thead> <tbody> <tr> <td>E01</td> <td>Lakshya</td> <td>54000</td> </tr> <tr> <td>E02</td> <td>Ravi</td> <td>NULL</td> </tr> <tr> <td>E03</td> <td>Neeraj</td> <td>32000</td> </tr> <tr> <td>E04</td> <td>Brijesh</td> <td>42000</td> </tr> </tbody> </table> <p>Table: Office</p> <table border="1"> <thead> <tr> <th>Emp_Id</th> <th>Dept</th> <th>DOJ</th> </tr> </thead> <tbody> <tr> <td>E01</td> <td>Computer</td> <td>05-SEP-2007</td> </tr> <tr> <td>E02</td> <td>Physics</td> <td>05-JAN-2008</td> </tr> <tr> <td>E03</td> <td>Sports</td> <td>30-DEC-2000</td> </tr> <tr> <td>E04</td> <td>English</td> <td>05-SEP-2012</td> </tr> </tbody> </table> <p>What will be the output of the following statement? SELECT Name, Dept FROM EMPLOYEE E, OFFICE O WHERE E.Emp_Id=O.Emp_Id;</p> <p>(b) Write the output of the queries (i) to (iv) based on the table Flights given below:</p> <p style="text-align: center;">Table: Flights</p> <table border="1"> <thead> <tr> <th>FNO</th> <th>FNAME</th> <th>FARE</th> <th>DATE</th> <th>FROM</th> <th>TO</th> </tr> </thead> <tbody> <tr> <td>F101</td> <td>AIR INDIA</td> <td>5000</td> <td>01-JAN-2022</td> <td>Bikaner</td> <td>Delhi</td> </tr> <tr> <td>F102</td> <td>INDIGO</td> <td>6000</td> <td>01-DEC-2023</td> <td>Jaipur</td> <td>Pune</td> </tr> <tr> <td>F103</td> <td>AIR ASIA</td> <td>5500</td> <td>05-SEP-2007</td> <td>Delhi</td> <td>Guwahati</td> </tr> <tr> <td>F104</td> <td>Kingfisher</td> <td>10000</td> <td>05-SEP-2007</td> <td>Mumbai</td> <td>Guwahati</td> </tr> </tbody> </table> <p>i. SELECT DISTINCT(TO) FROM Flights; ii. SELECT To, COUNT(*), MIN(fare) FROM Flights GROUP BY TO HAVING COUNT(TO)>1; iii. SELECT FNAME FROM Flights WHERE FARE>5000 ORDER BY NAME; iii. SELECT AVG(FARE) FROM Flights WHERE FARE BETWEEN 6000 TO 10000;</p>	Emp_Id	Name	Salary	E01	Lakshya	54000	E02	Ravi	NULL	E03	Neeraj	32000	E04	Brijesh	42000	Emp_Id	Dept	DOJ	E01	Computer	05-SEP-2007	E02	Physics	05-JAN-2008	E03	Sports	30-DEC-2000	E04	English	05-SEP-2012	FNO	FNAME	FARE	DATE	FROM	TO	F101	AIR INDIA	5000	01-JAN-2022	Bikaner	Delhi	F102	INDIGO	6000	01-DEC-2023	Jaipur	Pune	F103	AIR ASIA	5500	05-SEP-2007	Delhi	Guwahati	F104	Kingfisher	10000	05-SEP-2007	Mumbai	Guwahati	1+2
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F104	Kingfisher	10000	05-SEP-2007	Mumbai	Guwahati																																																									
27.	<p>Write a method COUNTLINES() in Python to read lines from text file “TESTFILE.TXT” and display the lines which are starting with any article (a, an, the) insensitive of the case. Example: If the file content is as follows: Give what you want to get. We all pray for everyone’s</p>	3																																																												

safety.
 A marked difference will come in our country.
 The Prime Minister is doing amazing things.
 The COUNTLINES() function should display the output as: The number of lines starting with any article are : 3

OR

Write a function GPCount() in Python, which should read each character of a text file "STORY.TXT" and then count and display the count of occurrence of alphabets G and P individually (including small cases g and p too).

Example:

If the file content is as follows:

God helps those who help themselves.
 Great way to be happy is to remain positive.
 Punctuality is a great virtue.

The GPCount() function should display the output as:

The number of G or g: 3

The number of P or p : 6

28. (a) Write the outputs of the SQL queries (i) to (iv) based on the relations CLUB and STUDENT given below:

3

Table : CLUB

COACHID	CNAME	AGE	SPORTS	DATEOFAPP	PAY	GENDER
1	KUKREJA	35	KARATE	27/03/1996	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	KATAKI	36	SWIMMING	24/02/1998	800	F
7	ANKITA	39	SQUASH	20/02/1998	2200	F
8	ZAREEN	37	KARATE	22/02/1998	1100	F
9	KUSH	41	SWIMMING	13/01/1998	900	M
10	SHAILYA	37	BASKETBALL	19/02/1998	1700	M

Table : STUDENT

COACHID	SNAME	STIPEND	STREAM	MARKS	GRADE	CLASS
1	KARAN	400.00	MEDICAL	78.5	B	12B
12	VINNET	450.00	COMMERCE	89.2	A	11C
13	VIVEK	300.00	COMMERCE	68.6	C	12C
4	DHRUV	350.00	HUMANITIES	73.1	B	12C
15	MOHIT	500.00	NONMEDICAL	90.6	A	11A
6	ANUJ	400.00	MEDICAL	75.4	B	12B
17	ABHAY	250.00	HUMANITIES	64.4	C	11A
18	PAYAL	450.00	NONMEDICAL	88.5	A	12A
19	DIKSHA	500.00	NONMEDICAL	92.0	A	12A
10	RISHIKA	300.00	COMMERCE	67.5	C	12C

- i) SELECT SPORTS, MIN(PAY) FROM Club Group by CLUB;
- ii) SELECT MAX(DATEOFAPP), MIN(DATEOFAPP) FROM CLUB;
- iii) SELECT CNAME, PAY, C.COACHID, SPORTS FROM CLUB C, STUDENT S

	<p>WHERE C.COACHID =S.COACHID AND PAY>=1500; iv) SELECT SName, CNAME FROM Student S, CLUB C WHERE Gender ='F' AND C.COACHID=S.COACHID;</p> <p>(b) Write SQL command to list all databases.</p>	
29.	<p>Write a function Lshift(L), where L is the list of elements passes as an argument to the function. The function shifts all the elements by one place to the left and then print it.</p> <p>For example: If L contains [9,4,0,3,11,56]</p> <p>The function will print - [4,0,3,11,56,9]</p>	3
30.	<p>A list named L contains following records of students: [Name, House, Marks]</p> <p>Write the following user defined functions to perform given operations on the stack named 'MarksList'</p> <p>(i) PUSH(L) – To push an object containing Name and Marks of students having marks greater than 75 from the list L on to the stack MarkList.</p> <p>(ii) POP() – To pop the objects from the stack and display them. Also, display "Stack Empty" when there are no elements in the stack.</p> <p>For example: If the lists of students details are:</p> <p>["Garima", "Green", 99] ["Jitendra", "Red", 58] ["Murugan", "Yellow",65] ["Ashmit", "Blue",97]</p> <p>The stack should contain ["Garima", 99] ["Ashmit", 97]</p> <p>The output should be: ["Garima", 99] ["Ashmit", 97] Stack Empty</p> <p style="text-align: center;">OR</p> <p>Write a function in Python, Push(EventDetails) where , EventDetails is a dictionary containing the number of persons attending the events– {EventName : NumberOfPersons}. The function should push the names of those events in the stack named 'BigEvents' which have number of persons greater than 200. Also display the count of elements pushed on to the stack.</p> <p>For example: If the dictionary contains the following data:</p>	3

	<p>EventDetails ={"Marriage":300, "Graduation Party":1500, "Birthday Party":80, "Get together" :150}</p> <p>The stack should contain Marriage Graduation Party</p> <p>The output should be: The count of elements in the stack is 2</p>	
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SECTION-D

31.	<p>KVS is planning to connect its Bikaner KV NAL Campus with its head office KVS RO Jaipur. Its Bikaner KV NAL Campus is spread across an area of approx. 1 square kilometers 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.</p> <div style="display: flex; justify-content: space-around; align-items: center; margin: 20px 0;"> <div style="border: 1px solid black; padding: 5px; text-align: center;">KVS RO Jaipur</div> <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Bikaner KV NAL Campus</p> <div style="display: flex; justify-content: space-around; margin: 5px 0;"> <div style="border: 1px solid black; padding: 2px 10px;">Human Resources</div> </div> <div style="display: flex; justify-content: space-around; margin: 5px 0;"> <div style="border: 1px solid black; padding: 2px 10px;">Administration</div> <div style="border: 1px solid black; padding: 2px 10px;">Academics</div> </div> </div> </div> <p>Shortest distances between various blocks</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">Human Resources to Administration</td> <td style="text-align: right;">100m</td> </tr> <tr> <td>Human Resources to Academics</td> <td style="text-align: right;">65m</td> </tr> <tr> <td>Academics to Administration</td> <td style="text-align: right;">110m</td> </tr> <tr> <td>KVS RO Jaipur to KV Bikaner NAL Campus</td> <td style="text-align: right;">350 km</td> </tr> </table> <p>Number of computers installed at various blocks</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Block</th> <th style="text-align: right;">Number of Computers</th> </tr> </thead> <tbody> <tr> <td>Human Resources</td> <td style="text-align: right;">155</td> </tr> <tr> <td>Administration</td> <td style="text-align: right;">20</td> </tr> <tr> <td>Academics</td> <td style="text-align: right;">100</td> </tr> <tr> <td>KVS RO Jaipur</td> <td style="text-align: right;">20</td> </tr> </tbody> </table> <p>(i) Suggest the most suitable block in the KV NAL Campus to host the server. Give a suitable reason with your suggestion.</p> <p>(ii) Suggest the cable layout among the various blocks within the KV NAL Campus for connecting the blocks.</p> <p>(iii) Suggest the placement of the following devices with appropriate reasons:</p> <ol style="list-style-type: none"> a. Switch / Hub b. Repeater <p>(iv) Suggest a protocol that shall be needed to provide Video Conferencing solution between KVS RO JAIPUR Office and Bikaner NAL KV campus.</p> <p>(v) Suggest a device that helps to strengthen the weak signals in a</p>	Human Resources to Administration	100m	Human Resources to Academics	65m	Academics to Administration	110m	KVS RO Jaipur to KV Bikaner NAL Campus	350 km	Block	Number of Computers	Human Resources	155	Administration	20	Academics	100	KVS RO Jaipur	20	5*1
Human Resources to Administration	100m																			
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Administration	20																			
Academics	100																			
KVS RO Jaipur	20																			

	network.	
32.	<p>(a) Write the output of the code given below:</p> <pre> a=5 def add(b=2): global a a=a+b print(a,'#',b) return a b=add(a) print(a,'#',b) b=add(b) print(a,'#',b) </pre> <p>(b) The code given below inserts the following record in the table Employee:</p> <pre> EmpNo - integer Name - string Department - string Salary - integer </pre> <p>Note the following to establish connectivity between Python and MYSQL:</p> <ul style="list-style-type: none"> ▪ Username is root ▪ Password is brick ▪ The table exists in a MYSQL database named organization. ▪ The details (EmpNo, Name, Department and Salary) are to be accepted from the user. <p>Write the following missing statements to complete the code:</p> <p>Statement 1 - to form the cursor object</p> <p>Statement 2 - to execute the command that inserts the record in the table Student.</p> <p>Statement 3- to add the record permanently in the database</p> <pre> import mysql.connector as mysql def sql_data(): con=mysql.connect(host="localhost",user="root",password="brick", database="organization") mycursor=_____ #Statement 1 eno=int(input("Enter Employee number :: ")) name=input("Enter Name :: ") dept=input("Enter Department name :: ") sal=int(input("Enter Salary :: ")) query="insert into student values({},'{}',{},{})".format(eno,name,dept,sal) _____ #Statement 2 _____ # Statement 3 print("Data Added successfully") </pre>	2+3

OR

(a) Predict the output of the code given below:

```
s="Think out of the Box!"
n =len(s)
d=""
for i in range(0, n):
    if s[i] >= 'a' and s[i] <= 'k':
        d = d + s[i].upper()
    elif (s[i] >= 'l' and s[i] <= 'z'):
        d = d + s[i-1]
    elif s[i].isupper():
        d = d + s[i].lower()
    else:
        d = d + '#'
print(d)
```

(a) The code given below reads the following record from the table named items and displays only those records who have price greater than 100:

**ItemNo -
integer
Name - string
Price - integer**

Note the following to establish connectivity between Python and MYSQL:

- **Username is root**
- **Password is epic**
- **The table exists in a MYSQL database named store.**

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 items with price greater than 100.

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 mysqlcon
def sql_data():
    con=mysqlcon.connect(host="localhost",user="root",
        password="epic", database="store")
    mycursor=_____#Statement1
    print("Items with price greater than 100 are :")
    _____#Statement2
    data=_____#Statement3
    for i in data:
        print(i)
```

3	(a) What does CSV stand for?	5
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3.	<p>(b) Write a Program in Python that defines and calls the following user defined functions:</p> <p>(i) InsertRow() – To accept and insert data of a student to a CSV file 'class.csv'. Each record consists of a list with field elements as rollno, name and marks to store roll number, student's name and marks respectively.</p> <p>(ii) COUNTD() – To count and return the number of students who scored marks greater than 75 in the CSV file named 'class.csv'.</p> <p style="text-align: center;">OR</p> <p>Dhirendra 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:</p> <p>a. CSVOpen() : to create a CSV file called BOOKS.CSV in append mode containing information of books – Title, Author and Price.</p> <p>b. CSVRead() : to display the records from the CSV file called BOOKS.CSV where the field title starts with 'R'.</p> <p>He has succeeded in writing partial code and has missed out certain statements, so he has left certain queries in comment lines.</p> <pre> import csv def CSVOpen(): with open('books.csv','____',newline='') as csvf: #Statement-1 cw=_____#Statement-2 _____#Statement-3 cw.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=_____#Statement-4 for r in cr: if _____: #Statement-5 print(r) except: print('File Not Found') CSVOpen() CSVRead() </pre> <p>You as an expert of Python have to provide the missing statements and other related queries based on the following code of Raman.</p> <p>(i) Choose the appropriate mode in which the file is to be opened in append mode (Statement 1)</p> <p>(ii) Which statement will be used to create a csv writer object in Statement 2.</p> <p>(iii) Choose the correct option for Statement 3 to write the names of the column headings in the CSV file, BOOKS.CSV.</p> <p>(iv) Which statement will be used to read a csv file in Statement 4.</p> <p>(v) Fill in the appropriate statement to check the field Title starting with 'R' for Statement 5 in the above program.</p>	
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SECTION-E

3 4.	Mubarak creates a table STORE with a set of records to maintain the details of items. After creation of the table, he has entered data of 7 items	1+1 +2
---------	--	-----------

in the table.

Table: STORE

ItemNo	Item	Scod e	Qty	Rate	LastBuy
2005	Sharpener Classic	23	60	8	31-JUN-09
2003	Balls	22	50	25	01-FEB-10
2002	Gel Pen Premium	21	150	12	24-FEB-10
2006	Gel Pen Classic	21	250	20	11-MAR-09
2001	Eraser Small	22	220	6	19-JAN-09
2004	Eraser Big	22	110	8	02-DEC-09
2009	Ball Pen 0.5	21	180	18	03-NOV-09

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 2 columns are added and 2 rows are deleted from the table STORE, 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 as (2022, Diary, 23, 10, 250, 18-OCT-2022).
 - b. Increase the rate of the items by 5% whose name begins with 'G'.

OR (Option for part iii only)

- (iii) Write the statements to:
 - a. Delete the record of items having rate less than 10.
 - b. Add a column REMARKS in the table with datatype as varchar with 50 characters

3
5.

Reshabh 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:

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 of Reshabh.

```
import pickle
def AddStudents():
    _____ # statement 1 to open the binary file to write data
    while True:
        Rno = int(input("Rno :"))
        Name = input("Name : ")
        Percent = float(input("Percent :"))
```

	<pre> L = [Rno, Name, Percent] _____ #statement 2 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: _____ #statement 3 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("No student has percentage more than 75") print("average percent of class = ",_____) #statement 4 AddStudents() GetStudents() </pre>	
	<p>(i) Which of the following commands is used to open the file "STUDENT.DAT" for writing only in binary format? (marked as #1 in the Python code)</p>	1
	<p>(ii) Which of the following commands is used to write the list L into the binary file, STUDENT.DAT? (marked as #2 in the Python code)</p>	1
	<p>(iii) Which of the following commands is used to read each record from the binary file STUDENT.DAT? (marked as #3 in the Python code)</p>	1
	<p>(iv) What expression will be placed in statement 4 to print the average percent of the class.</p>	1

Marking Scheme Practice Paper-5

SECTION-A								
QN.	Answer of Question							
1.	Ans. True	1						
2.	Ans. (d)=-	1						
3.	Ans: (a) dict_fruit.update(dict_vegetable)	1						
4.	Ans. (a) True	1						
5.	Ans. (b) Python. is amazing.	1						
6.	Ans: (b) a+	1						
7.	Ans. (d) drop	1						
8.	Ans. (d) ALTER TABLE	1						
9.	Ans. (b) Statement 4	1						
10	Ans. (b) Foreign Key	1						
11	Ans: (b) Number of bytes already read from the file	1						
12	Ans. Count	1						
13	Ans. (a) TCP	1						
14	Ans. (a) 16	1						
15	Ans. (c) distinct()	1						
16	(c) any one of (a) or (b)	1						
17	Ans. (c)	1						
18	Ans: (a) Both A and R are true and R is the correct explanation for A	1						
SECTION-B								
19	<pre>import math x =int(input("Enter a number:")) if (math.abs(x)== x): print("You entered a positive number") else: x*=-1 print("Number made positive : ",x)</pre>	2						
20	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">Coaxial</th> <th style="width: 50%; text-align: center;">Fiber</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1. Relatively cheaper</td> <td style="text-align: center;">1. Relatively costly</td> </tr> <tr> <td style="text-align: center;">2. less reliable</td> <td style="text-align: center;">2. More reliable</td> </tr> </tbody> </table> <p style="text-align: center;">OR</p> <p style="text-align: center;">Sender, Receiver, transmission media, protocol, message</p>	Coaxial	Fiber	1. Relatively cheaper	1. Relatively costly	2. less reliable	2. More reliable	2
Coaxial	Fiber							
1. Relatively cheaper	1. Relatively costly							
2. less reliable	2. More reliable							
21	(a) !!ot nr	1						
·	(b) dict_items([('title','you can win'),('copies',15),('author','Shiv Khera'),('genre','Motivation')])	1						
22	<p>Ans. GROUP BY clause is used to get the summary data based on one or more groups. The groups can be formed on one or more columns. For example, the GROUP BY query will be used to count the number of employees in each department, or to get the department wise total salaries.</p> <pre>SELECT COUNT(ENAME), SUM(SALARY), DEPT FROM EMPLOYEES GROUP BY DEPT;</pre>	2						
23	Ans. (a) (i) Hyper Text Transfer Protocol (ii) Internet Protocol	2						

.	(b) Telnet is a network protocol used to virtually access a computer and to provide a two-way, collaborative and text-based communication channel between two machines.											
24	<p>unchanged (30, 50) changed (16, 50) unchanged (16, 22) changed (11, 22)</p> <p style="text-align: center;">OR</p> <p>(30,60,90)</p>	2										
25	<p>Ans. Where” clause is used to filter the records from a table that is based on a specified condition, then the “Having” clause is used to filter the record from the groups based on the specified condition.</p> <p style="text-align: center;">OR</p> <p>Ans. DDL used to define the schema objects-(ALTER, DROP) and DML used to manipulates the database (INSERT, UPDATE, DELETE)</p>	2										
SECTION-C												
26	<p>a)</p> <table border="1" style="margin-left: 20px;"> <tr> <td>Name</td> <td>Dept</td> </tr> <tr> <td>Lakshya</td> <td>Computer</td> </tr> <tr> <td>Ravi</td> <td>Physics</td> </tr> <tr> <td>Neeraj</td> <td>Sports</td> </tr> <tr> <td>Brijesh</td> <td>English</td> </tr> </table> <p>b)</p> <p>(i) <u>TO</u> Delhi Pune Guwahati</p> <p>ii) <u>TO</u> <u>COUNT(*)</u> <u>MIN(FARE)</u> Guwahati 2 10000</p> <p>iii) <u>FNAME</u> INDIGO AIR ASIA Kingfisher</p> <p>iv) <u>AVG(FARE)</u> 7166.66</p>	Name	Dept	Lakshya	Computer	Ravi	Physics	Neeraj	Sports	Brijesh	English	1+2
Name	Dept											
Lakshya	Computer											
Ravi	Physics											
Neeraj	Sports											
Brijesh	English											
27	<p>Ans:</p> <pre>def COUNTLINES() : file = open ('TESTFILE.TXT', 'r') List = file.readlines() count=0 for line in List: words=line.split() if words[0].lower() in ('a','an','the'): count = count + 1 print("The number of lines starting with any article are :", count) file.close</pre>	3										

	<p>0</p> <p style="text-align: center;">OR</p> <p>Ans:</p> <pre>def GPCount(): file = open('STORY.TXT', 'r') content = file.read() for i in content: if i.lower() == 'g': countG = countG + 1 if i.lower() == 'p': countP = countP + 1 print("The number of G or g : ", countG) print("The number of P or p : ", countP) file.close()</pre> <p>Note: Any other relevant and correct code may be marked</p>													
28	<p>Ans. (a)</p> <p>i) Give 1 mark each correct output</p> <pre>SPORTS Karate 1000 Squash 2000 Basketball 1500 Swimming 750</pre> <p>ii) Give 1 mark each correct output</p> <pre>MAX(DATEOFAPP), MIN(DATEOFAPP) 27/03/1996 24/02/1998</pre> <p>iii) Give 1 mark each correct output</p> <table border="0" style="width: 100%;"> <thead> <tr> <th><u>CNAME</u></th> <th><u>PAY</u></th> <th><u>C.COACHID</u></th> <th><u>SPORTS</u></th> </tr> </thead> <tbody> <tr> <td>TARUN</td> <td>1500</td> <td>4</td> <td>BASKETBALL</td> </tr> <tr> <td>SHAILYA</td> <td>1700</td> <td>10</td> <td>BASKETBALL</td> </tr> </tbody> </table> <p>iv) Give 1 mark each correct output</p> <pre><u>SNAME</u> <u>CNAME</u> ANUJ KATAKI</pre> <p>b) Show databases;</p>	<u>CNAME</u>	<u>PAY</u>	<u>C.COACHID</u>	<u>SPORTS</u>	TARUN	1500	4	BASKETBALL	SHAILYA	1700	10	BASKETBALL	3
<u>CNAME</u>	<u>PAY</u>	<u>C.COACHID</u>	<u>SPORTS</u>											
TARUN	1500	4	BASKETBALL											
SHAILYA	1700	10	BASKETBALL											
29	<pre>def Lshift(L): L = L[1:]+L[0] print(L)</pre>	3												
30	<pre>def PUSH(L): for i in L: if i[2]>75: MarkList.append([i[0],i[2]]) def POP(): while True: if len(MarkList): print(MarkList.pop()) else: print("Stack Empty")</pre> <p style="text-align: center;">OR</p> <pre>def Push(EventDetails):</pre>	3												

	<pre> BigEvents=[] count=0 for i in EventDetails: if EventDetails[i]>200: BigEvents.append(i) count+=1 print("The count of elements in the stack is",count) </pre>	
SECTION-D		
31	<p>Ans. (i) Academics because it has maximum number of computers</p> <p>(ii) Star topology (any appropriate block diagram)</p> <p>(iii) Switch need to be installed in each of the block</p> <p>(iv) VoIP</p> <p>(v) Repeater/Amplifier</p>	5*1
32	<p>Ans. (a)</p> <p>10 # 5</p> <p>10 # 10</p> <p>20 # 10</p> <p>20 # 20</p> <p>Ans: (b)</p> <p>Statement 1: con.cursor()</p> <p>Statement 2: mycursor.execute(query)</p> <p>Statement 3: con.commit()</p> <p style="text-align: center;">OR</p> <p>Ans. (a) tHliK# ou# F# HE#bBo#</p> <p>Ans. (b)</p> <p>Statement 1: con.cursor()</p> <p>Statement 2: mycursor.execute("select Name from items where price>100")</p> <p>Statement 3: mycursor.fetchall()</p>	2+3
33	<p>(a) Comma separated value</p> <p>(b) (i)</p> <pre> def InsertRow(): import csv f=open("class.csv","a+",newline="") rno=int(input("Enter roll no. :")) name=int(input("Enter name :")) marks=int(input("Enter marks :")) wo=csv.writer(f) wo.writerow([rno, name, marks]) f.close() </pre> <p>(b)(ii)</p> <pre> def COUNTD(): import csv count=0 </pre>	5

	<pre>f=open("class.csv","r") ro=csv.reader(f) for i in ro: if i[2]>75: count+=1 return count</pre> <p style="text-align: center;">OR</p> <p>Which statement will be used to create a csv writer object in Statement 2.</p> <p>(vi) Choose the correct option for Statement 3 to write the names of the column headings in the CSV file, BOOKS.CSV.</p> <p>(vii) Which statement will be used to read a csv file in Statement 4.</p> <p>(viii) Fill in the appropriate statement to check the field Title starting with 'R' for Statement 5 in the above program.</p> <p>(i) a</p> <p>(ii) csv.writer(csvf)</p> <p>(iii) cw.writerow(['Title','Author','Price'])</p> <p>(iv) csv.reader(csvf)</p> <p>(v) r[0][0]=='R'</p>	
SECTION-E		
34	<p>Ans. (i) ItemNo</p> <p>(ii) Cardinality=5 and Degree=8</p> <p>(iii)</p> <p>a) Insert into Store values (2022, 'Diary', 23, 10, 250, '2022-OCT-18');</p> <p>b) Update Store</p> <p style="padding-left: 20px;">Set Rate=Rate+(Rate*0.05)</p> <p style="padding-left: 20px;">Where Item like 'G%';</p> <p style="text-align: center;">OR</p> <p>iii) Delete From Store where rate<10;</p> <p>b) Alter table Store Add column (Remarks Varchar(50));</p>	1+1 +2
35	<p>(i) F= open("STUDENT.DAT",'wb')</p> <p>(ii) pickle.dump(L,F)</p> <p>(iii) R = pickle.load(F)</p> <p>(iv) Total / Countabove75</p>	1 1 1 1

Computer Science (083)
CBSE Sample Question Paper with marking scheme
Class: XII
Session: 2022-23

Maximum Marks: 70

Time Allowed: 3 hours

SECTION A (1 mark to be awarded for every correct answer)		
1.	State True or False – “Variable declaration is implicit in Python.” Ans. TRUE	1
2.	Which of the following is an invalid datatype in Python? (a) Set (b) None (c) Integer (d) Real Ans: (d) Real	1
3.	Given the following dictionaries dict_exam={"Exam": "AISSCE", "Year": 2023} dict_result={"Total": 500, "Pass_Marks": 165} Which statement will merge the contents of both dictionaries? a. dict_exam.update(dict_result) b. dict_exam + dict_result c. dict_exam.add(dict_result) d. dict_exam.merge(dict_result) Ans: (a) dict_exam.update(dict_result)	1
4.	Consider the given expression: not True and False or True Which of the following will be correct output if the given expression is evaluated? a. True b. False c. NONE d. NULL Ans: (a) True	1
5	Select the correct output of the code: a = "Year 2022 at All the best" a = a.split('2') b = a[0] + ". " + a[1] + ". " + a[3] print (b) (a) Year . 0. at All the best (b) Year 0. at All the best (c) Year . 022. at All the best (d) Year . 0. at all the best Ans: (a) Year . 0. at All the best	1
6.	Which of the following mode in file opening statement results or generates an error if the file does not exist? (a) a+ (b) r+ (c) w+ (d) None of the above Ans: (b) r+	1
7.	Fill in the blank: _____ command is used to remove primary key from a table in SQL. (a) update (b) remove (c) alter (d) drop Ans: (c) alter	1

8.	Which of the following commands will delete the table from MYSQL database? a. DELETE TABLE b. DROP TABLE c. REMOVE TABLE d. ALTER TABLE Ans: (b) DROP TABLE	1
9.	Which of the following statement(s) would give an error after executing the following code? S="Welcome to class XII" # Statement 1 print(S) # Statement 2 S="Thank you" # Statement 3 S[0]= '@' # Statement 4 S=S+"Thank you" # Statement 5 a. Statement 3 b. Statement 4 c. Statement 5 d. Statement 4 and 5 Ans: (b) – Statement 4	1
10.	Fill in the blank: _____ is a non-key attribute, whose values are derived from the primary key of some other table. a. Primary Key b. Foreign Key c. Candidate Key d. Alternate Key Ans: (b) Foreign Key	
11.	The correct syntax of seek() is: (a) file_object.seek(offset [, reference_point]) (b) seek(offset [, reference_point]) (c) seek(offset, file_object) (d) seek.file_object(offset) Ans: (a) file_object.seek(offset [, reference_point])	
12	Fill in the blank: The SELECT statement when combined with _____ clause, returns records without repetition. a. DESCRIBE b. UNIQUE c. DISTINCT d. NULL Ans: (c) DISTINCT	
13.	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 Ans: (a) VoIP	
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	
15.	Which function is used to display the total number of records from a table in a database? a. sum(*) b. total(*) c. count(*) d. return(*) Ans: (c) count(*)	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

<p>Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as</p> <p>(a) Both A and R are true and R is the correct explanation for A</p> <p>(b) Both A and R are true and R is not the correct explanation for A</p> <p>(c) A is True but R is False</p> <p>(d) A is false but R is True</p>		
17.	<p>Assertion (A):- If the arguments in a function call statement match the number and order of arguments as defined in the function definition, such arguments are called positional arguments.</p> <p>Reasoning (R):- During a function call, the argument list first contains default argument(s) followed by positional argument(s).</p> <p>Ans: (c) A is True but R is False</p>	1
18.	<p>Assertion (A): CSV (Comma Separated Values) is a file format for data storage which looks like a text file.</p> <p>Reason (R): The information is organized with one record on each line and each field is separated by comma.</p> <p>Ans: (a) Both A and R are true and R is the correct explanation for A</p>	1
<u>SECTION B</u>		
19.	<p>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.</p> <pre>def prime(): n=int(input("Enter number to check :: ")for i in range (2, n//2): if n%i=0: print("Number is not prime \n")break else: print("Number is prime \n')</pre> <p>Ans:</p> <pre>def prime(): n=int(input("Enter number to check :: ") #bracket missing for i in range (2, n//2): if n%i=0: # = missing print("Number is not prime \n") __break #wrong indent else: print("Number is prime \n") # quote mismatch</pre> <p>(½ mark for each correct correction made and underlined.)</p>	2
20	Write two points of difference between Circuit Switching and Packet Switching.	2

Ans:

Circuit Switching	Packet Switching
Circuit switching is the method of switching which is used for establishing a dedicated communication path between the sender and the receiver.	Packet switching is the method of switching where no dedicated path is established from the source to the destination.
Data is processed and transmitted at the source only.	Data is processed and transmitted, not only at the source but at each switching station.
It is more reliable.	It is less reliable.

(1 mark for each correct point of difference)

OR

Write two points of difference between XML and HTML.

Ans:

XML (Extensible MarkupLanguage)

- XML tags are not predefined, they are user defined
- XML stores and transfers data.
- Dynamic in nature
- HTML (Hypertext Markup Language)
- HTML tags are pre-defined and it is a markup language
- HTML is about displaying data.
- Static in nature

(1 mark for each correct difference - Any two)

21

- a. Given is a Python string declaration:
myexam="@@CBSE Examination 2022@@"
Write the output of: print(myexam[::-2])

Ans: @20 otnmx SC@

(1 mark for the correct answer)

- b. Write the output of the code given below:
my_dict = {"name": "Aman", "age": 26}
my_dict['age'] = 27
my_dict['address'] = "Delhi"
print(my_dict.items())

Ans: dict_items([('name', 'Aman'), ('age', 27), ('address', 'Delhi')])

(1 mark for the correct answer)

22	<p>Explain the use of 'Foreign Key' in a Relational Database Management System. Give example to support your answer. Ans: A foreign key is used to set or represent a relationship between two relations (or tables) in a database. Its value is derived from the primary key attribute of another relation. For example: In the tables TRAINER and COURSE given below, TID is primary key in TRAINER table but foreign key in COURSE table.</p> <p>TRAINER</p> <table border="1" data-bbox="304 510 1281 748"> <thead> <tr> <th>TID</th> <th>TNAME</th> <th>CITY</th> <th>HIREDATE</th> <th>SALARY</th> </tr> </thead> <tbody> <tr> <td>101</td> <td>Ritu</td> <td>Nagpur</td> <td>1998-10-15</td> <td>56700</td> </tr> <tr> <td>102</td> <td>Navin</td> <td>Goa</td> <td>1994-12-24</td> <td>80000</td> </tr> <tr> <td>103</td> <td>Murugan</td> <td>Chandigarh</td> <td>2001-12-21</td> <td>82000</td> </tr> <tr> <td>104</td> <td>Jyothi</td> <td>Guwahati</td> <td>2002-12-25</td> <td>68000</td> </tr> <tr> <td>105</td> <td>Chanu</td> <td>Mumbai</td> <td>1996-01-12</td> <td>95000</td> </tr> </tbody> </table> <p style="text-align: center;">COURSE</p> <table border="1" data-bbox="252 801 1230 1039"> <thead> <tr> <th>CID</th> <th>CNAME</th> <th>FEES</th> <th>STARTDATE</th> <th>TID</th> </tr> </thead> <tbody> <tr> <td>C201</td> <td>Deepa</td> <td>12000</td> <td>2018-07-02</td> <td>101</td> </tr> <tr> <td>C202</td> <td>Sindhu</td> <td>15000</td> <td>2018-07-15</td> <td>103</td> </tr> <tr> <td>C203</td> <td>Neeraj</td> <td>10000</td> <td>2018-10-01</td> <td>102</td> </tr> <tr> <td>C204</td> <td>Prakash</td> <td>9000</td> <td>2018-09-15</td> <td>104</td> </tr> <tr> <td>C205</td> <td>Nikhat</td> <td>20000</td> <td>2018-08-01</td> <td>101</td> </tr> </tbody> </table> <p>(1 mark for explanation and 1 mark for example) (Any relevant correct example may be marked)</p>	TID	TNAME	CITY	HIREDATE	SALARY	101	Ritu	Nagpur	1998-10-15	56700	102	Navin	Goa	1994-12-24	80000	103	Murugan	Chandigarh	2001-12-21	82000	104	Jyothi	Guwahati	2002-12-25	68000	105	Chanu	Mumbai	1996-01-12	95000	CID	CNAME	FEES	STARTDATE	TID	C201	Deepa	12000	2018-07-02	101	C202	Sindhu	15000	2018-07-15	103	C203	Neeraj	10000	2018-10-01	102	C204	Prakash	9000	2018-09-15	104	C205	Nikhat	20000	2018-08-01	101	
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23	<p>(a) Write the full forms of the following: (i) SMTP (ii) PPP Ans: (i) SMTP: Simple Mail Transfer Protocol (ii) PPP: Point to Point Protocol (½ mark for every correct full form) (b) What is the use of TELNET? Ans: TELNET is used to access a remote computer / network. (1 mark for correct answer)</p>																																																													
24	<p>Predict the output of the Python code given below:</p> <pre>def Diff(N1,N2):if N1>N2: return N1-N2 else: return N2-N1 NUM= [10,23,14,54,32] for CNT in range (4,0,-1): A=NUM[CNT] B=NUM[CNT-1] print(Diff(A,B),'#', end=' ')</pre> <p>Ans: 22 # 40 # 9 # 13 # (½ mark for the correct digit with a #)</p> <p style="text-align: center;">OR</p>																																																													

Predict the output of the Python code given below:

```

tuple1 = (11, 22, 33, 44, 55 ,66)
list1 =list(tuple1)
new_list = []
for i in list1:if
    i%2==0:
        new_list.append(i)
new_tuple = tuple(new_list)
print(new_tuple)
Ans: (22,44,66)
(½ mark for each correct digit , ½ mark for enclosing in parenthesis)

```

25 Differentiate between COUNT() and COUNT(*) functions in SQL with appropriate example.
 Ans:COUNT(*) returns the count of all rows in the table, whereas COUNT () is used with Column_Name passed as argument and counts the number of non-NULL values in a column that is given as argument.
 Example: Table : EMPL

EMPNO	ENAME	JOB	SAL	DEPTNO
8369	SMITH	CLERK	2985	10
8499	ANYA	NULL	9870	20
8566	AMIR	SALESMAN	8760	30
8698	BINA	MANAGER	5643	20
8912	SUR	NULL	3000	10

e.g. SELECT COUNT(*) FROM EMPL;
 Output COUNT(*) 5
 e.g.2 SELECT COUNT(JOB) FROM EMPL;
 Output COUNT(JOB) 3
 Since JOB has 2 NULL values
 (1 mark for the difference and 1 mark for appropriate example)
 OR
 Categorize the following commands as DDL or DML:INSERT, UPDATE, ALTER, DROP
 Ans:
 DDL- ALTER, DROP
 DML – INSERT, UPDATE
 (½ mark for each correct categorization)

Section-C

26 (a) Consider the following tables – Bank_Account and Branch:

Table: Bank_Account

ACode	Name	Type
A01	Amrita	Savings
A02	Parthodas	Current
A03	Miraben	Current

Table: Branch

ACode	City
A01	Delhi
A02	Mumbai

A01 Nagpur

What will be the output of the following statement?
SELECT * FROM Bank_Account NATURAL JOIN Branch;

Ans:

Acode	Name	Type	City
A01	Amrita	Savings	Delhi
A01	Amrita	Savings	Nagpur
A02	Parthodas	Current	Mumbai

(1 mark for correct output)

B. Write the output of the queries (i) to (iv) based on the table, TECH_COURSE given below:

Table: TECH_COURSE

CID	CNAME	FEES	STARTDATE	TID
C201	Animation and VFX	12000	2022-07-02	101
C202	CADD	15000	2021-11-15	NULL
C203	DCA	10000	2020-10-01	102
C204	DDTP	9000	2021-09-15	104
C205	Mobile Application Development	18000	2022-11-01	101
C206	Digital marketing	16000	2022-07-25	103

i. SELECT DISTINCT TID FROM TECH_COURSE;

Ans:

DISTINCT TID
101
NULL
102
104
103

ii. SELECT TID, COUNT(*), MIN(FEES) FROM TECH_COURSE GROUP BY TID HAVING COUNT(TID)>1;

Ans:

TID	COUNT(*)	MIN(FEES)
101	2	12000

(½ mark for the correct output)

iii. SELECT CNAME FROM TECH_COURSE WHERE FEES>15000 ORDER BY CNAME;

Ans: CNAME

Digital marketing

Mobile Application Development

(½ mark for the correct output)

iv. SELECT AVG(FEES) FROM TECH_COURSE WHERE FEES BETWEEN 15000 AND 17000;

Ans: 15500.00 (½ mark for the correct output)

27

Write a method COUNTLINES() in Python to read lines from text file 'TESTFILE.TXT' and display the lines which are not starting with any vowel.

Example:

If the file content is as follows:

An apple a day keeps the doctor away.

We all pray for everyone's safety.

A marked difference will come in our country.

The COUNTLINES() function should display the output as:
The number of lines not starting with any vowel - 1

Ans:

```
def COUNTLINES() :  
    file = open ('TESTFILE.TXT', 'r')  
    lines = file.readlines()  
    count=0  
    for w in lines :  
        if (w[0]).lower() not in 'aeiou':  
            count = count + 1  
    print ("The number of lines not starting with any vowel: ", count)  
    file.close()
```

COUNTLINES()

(½ mark for correctly opening and closing the file

½ for readlines()

½ mark for correct loop

½ for correct if statement

½ mark for correctly incrementing count

½ mark for displaying the correct output)

OR

Write a function ETCOUNT() in Python, which should read each character of a text file "TESTFILE.TXT" and then count and display the count of occurrence of alphabets E and T individually (including small cases e and t too).

Example:

If the file content is as follows:

Today is a pleasant
day.It might rain
today.
It is mentioned on weather sites

The ETCOUNT() function should display the output as:

The number of E or e : 6

The number of T or t : 9

Ans:

```
def ETCOUNT() :  
    file = open ('TESTFILE.TXT', 'r')  
    lines = file.readlines()  
    countE=0  
    countT=0  
    for w in lines :  
        for ch  
            in w:  
                if ch in 'Ee':  
                    countE = countE + 1  
                if ch  
                    in 'Tt':  
                        countT=countT + 1  
    print ("The number of E or e : ", countE)  
    print ("The number of T or t : ", countT)  
    file.close()
```

($\frac{1}{2}$ mark for correctly opening and closing the file
 $\frac{1}{2}$ for readlines()
 $\frac{1}{2}$ mark for correct loops
 $\frac{1}{2}$ for correct if statement
 $\frac{1}{2}$ mark for correctly incrementing counts
 $\frac{1}{2}$ mark for displaying the correct output)
 Note: Any other relevant and correct code may be marked

28

(a) Write the outputs of the SQL queries (i) to (iii) 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	Shalakra	33	Mathematics	2018-07-31	20000	F

i. SELECT Department, avg(salary) FROM Teacher GROUPBY Department;

Ans:

Department	Avg(Salary)
Computer Sc	16500.00
History	30000.00
Mathematics	25000.00

($\frac{1}{2}$ mark for the correct output)

ii. SELECT MAX(Date_of_Join),MIN(Date_of_Join) FROMTeacher;

Ans:

Max(Date_of_Join)	Min(Date_of_Join)
2021-09-05	2017-03-04

($\frac{1}{2}$ mark for the correct output)

iii. SELECT Name, Salary, T.Department, Place FROM TeacherT, Placement P WHERE T.Department = P.Department AND Salary>20000;

Ans:

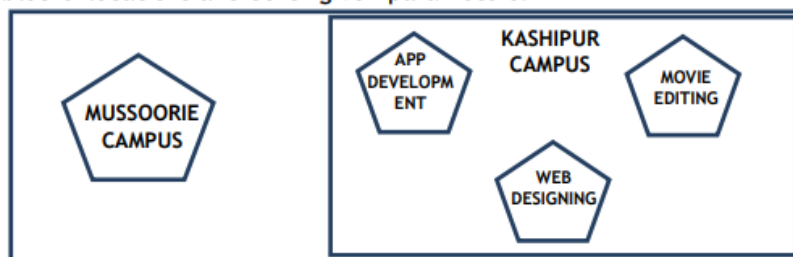
Name	Salary	Department	Place
Randeep	30000	Mathematics	Jaipur
Samira	40000	History	Ahmedabad
Raman	25000	Mathematics	Jaipur
Shyam	30000	History	Ahmedabad
Shiv	21000	Computer Sc	Nagpur

($\frac{1}{2}$ mark for the correct output)

iv. SELECT Name, Place FROM Teacher T, Placement P WHEREGender='F' and T.Department=P.Department;

	<p>Ans:</p> <table border="1" data-bbox="363 143 767 360"> <thead> <tr> <th>Name</th> <th>Place</th> </tr> </thead> <tbody> <tr> <td>Samira</td> <td>Ahmedabad</td> </tr> <tr> <td>Suman</td> <td>Ahmedabad</td> </tr> <tr> <td>Shalaka</td> <td>Jaipur</td> </tr> </tbody> </table> <p>(½ mark for the correct output) (b) Write the command to view all tables in a database. Ans: SHOW TABLES; (1 mark for correct answer)</p>	Name	Place	Samira	Ahmedabad	Suman	Ahmedabad	Shalaka	Jaipur	
Name	Place									
Samira	Ahmedabad									
Suman	Ahmedabad									
Shalaka	Jaipur									
29	<p>Write a function INDEX_LIST(L), where L is the list of elements passed as argument to the function. The function returns another list named indexList that stores the indices of all Non-Zero Elements of L. For example: If L contains [12,4,0,11,0,56] The indexList will have - [0,1,3,5] Ans: def INDEX_LIST(L): indexList=[] for i in range(len(L)):if L[i]!=0: indexList.append(i) return indexList</p> <p>(½ mark for correct function header 1 mark for correct loop 1 mark for correct if statement ½ mark for return statement) Note: Any other relevant and correct code may be marked</p>									
30	<p>A list contains following record of a customer: [Customer_name, Phone_number, City] Write the following user defined functions to perform given operations on the stack named status:</p> <ul style="list-style-type: none"> (i) Push_element() - To Push an object containing name and Phone number of customers who live in Goa to the stack (ii) Pop_element() - To Pop the objects from the stack and display them. Also, display "Stack Empty" when there are no elements in the stack. <p>For example: If the lists of customer details are: ["Gurdas", "9999999999", "Goa"] ["Julee", "8888888888", "Mumbai"] ["Murugan", "7777777777", "Cochin"] ["Ashmit", "1010101010", "Goa"] The stack should contain ["Ashmit", "1010101010"] ["Gurdas", "9999999999"]</p> <p>The output should be: ["Ashmit", "1010101010"] ["Gurdas", "9999999999"] Stack Empty Ans: status=[]</p>									

	<pre>def Push_element(cust):if cust[2]=="Goa": L1=[cust[0],cust[1]] status.append(L1) def Pop_element (): num=len(status) while len(status)!=0: dele=status.pop() print(dele) num=num-1 else: print("Stack Empty")</pre> <p>(1.5 marks for correct push_element() and 1.5 marks for correctpop_element())</p> <p style="text-align: center;">OR</p> <p>Write a function in Python, Push(SItem) where , SItem is a dictionary containing the details of stationary items- {Sname:price}. The function should push the names of those items in the stack who have price greater than 75. Also display the count of elements pushed into the stack. For example: If the dictionary contains the following data: Ditem={"Pen":106,"Pencil":59,"Notebook":80,"Eraser":25} The stack should containNotebook Pen</p> <p>The output should be: The count of elements in the stack is 2</p> <p>Ans: stackItem=[] def Push(SItem): count=0 for k in SItem: if (SItem[k]>=75): stackItem.append(k) count=count+1 print("The count of elements in the stack is : ",count)</p> <p>(1 mark for correct function header 1 mark for correct loop ½ mark for correct If statement ½ mark for correct display of count)</p>	
<u>Section-D</u>		
31	<p>MakeInIndia Corporation, an Uttarakhand based IT Training company, is planning to set up training centres in various cities in next 2 years. Their first campus is coming up in Kashipur district. At Kashipur campus, they are planning to have 3 different blocks for App development, Web designing and Movie Editing. Each block has number of computers, which are required to be connected in a network for communication, data and resource sharing. As a network consultantof this company, you have to suggest the best network related solutions for themfor issues/problems raised in question nos. (i) to (v), keeping in mind the distances between various blocks/locations and other given parameters.</p>	



Distance between various blocks/locations:

Block	Distance
App development to Web designing	28 m
App development to Movie editing	55 m
Web designing to Movie editing	32 m
Kashipur Campus to Mussoorie Campus	232 km

Number of computers

Block	Number of Computers
App development	75
Web designing	50
Movie editing	80

- i. Suggest the most appropriate block/location to house the SERVER in the Kashipur campus (out of the 3 blocks) to get the best and effective connectivity. Justify your answer.

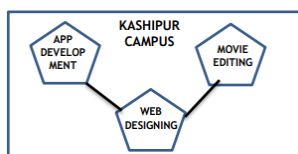
Ans: Movie editing block is the most appropriate to house the server as it has the maximum number of computers.

(1/2 mark for naming the server block and 1/2 mark for correct reason.)

- ii. Suggest a device/software to be installed in the Kashipur Campus to take care of data security.

Ans: Firewall (1 mark for the correct answer)

- iii. Suggest the best wired medium and draw the cable layout (Block to Block) to economically connect various blocks within the Kashipur Campus. Ans: Ethernet Cable
Cable Layout:



(1/2 mark correct wired medium, 1/2 mark for layout)

- iv. Suggest the placement of the following devices with appropriate reasons:

- a. Switch / Hub
- b. Repeater

Ans: Switch/hub will be placed in all blocks to have connectivity within the block. Repeater is not required between the blocks as the distances are less than 100 mts.

(1 mark for the correct answer)

	<p>v.Suggest the protocol that shall be needed to provide Video Conferencing solution between Kashipur Campus and Mussoorie Campus. Ans: Protocol: VoIP (1 mark for the correct answer)</p>	
32	<p>(a) Write the output of the code given below</p> <pre>p=5 def sum(q,r=2): global p p=r+q**2 print(p, end= '#')</pre> <p>a=10 b=5 sum(a,b) sum(r=5,q=1)</p> <p>Ans: Output:105#6# (1 mark for 105# and 1 mark for 6#)</p> <p>(b) The code given below inserts the following record in the table Student:</p> <pre>RollNo - integer Name - string Clas - integer Marks - integer</pre> <p>Note the following to establish connectivity between Python and MYSQL:</p> <ul style="list-style-type: none"> ▪ 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. <p>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</p> <pre>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 :: ") clas=int(input("Enter class :: ")) marks=int(input("Enter Marks :: ")) query="insert into student values({},'{}',{},{})".format(rno,name,clas,marks)</pre>	

```

..... #Statement 2
..... # Statement 3
print("Data Added successfully")

```

Ans:

Statement 1:

```
con1.cursor()
```

Statement 2: mycursor.execute(query)

Statement 3: con1.commit()

(1 mark for each correct answer)

OR

(a) Predict the output of the code given below:

```

s="welcome2cs"
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)

```

Ans:

sELCcME&Cc

(1 mark for first 5 characters, 1 mark for next 5 characters)

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 mysqldef
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

```

	<pre> data=_____ for i in data: print(i) print() Ans: Statement 1: con1.cursor() Statement 2: mycursor.execute("select * from student where Marks>75") Statement 3: mycursor.fetchall() (1 mark for each correct statement) </pre>	#Statement 3
33	<p>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:</p> <p>a) 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.</p> <p>b) COUNTR() – To count the number of records present in the CSV file named ‘record.csv’.</p> <p>Ans: Advantage of a csv file:</p> <ul style="list-style-type: none"> • It is human readable – can be opened in Excel and Notepad applications • It is just like text file <p><u>Program:</u></p> <pre> import csv def ADD(): 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 () </pre> <p>(1 mark for advantage ½ mark for importing csv module 1 ½ marks each for correct definition of ADD() and COUNTR() ½ mark for function call statements) OR</p> <p>Give any one point of difference between a binary file and a csv file.</p>	

Write a Program in Python that defines and calls the following user defined functions:

- a) 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 furnitureprice respectively.
- b) search()- To display the records of the furniture whose price is more than 10000.

Ans:

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():
```

```
    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()
```

(1 mark for difference ½ mark for importing csv module 1 ½ marks each for correct definition of add() and search() ½ mark for function call statements)

SECTION-E

34 Navdeep creates a table RESULT with a set of records to maintain the marks secured by students in Sem 1, Sem2, Sem3 and their division. After creation of the table, he has entered data of 7 students in the table.

Table: RESULT

ROLL_NO	SNAME	SEM1	SEM2	SEM3	DIVISION
101	KARAN	366	410	402	I
102	NAMAN	300	350	325	I
103	ISHA	400	410	415	I
104	RENU	350	357	415	I
105	ARPIT	100	75	178	IV
106	SABINA	100	205	217	II
107	NEELAM	470	450	471	I

Based on the data given above answer the following questions:

i. Identify the most appropriate column, which can be considered as Primary key.

Ans: ROLL_NO (01 mark for correct answer)

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?

Ans: New Degree: 8

New Cardinality: 5

(1/2 mark for correct degree and 1/2 mark for correct cardinality)

iii. Write the statements to:

- Insert the following record into the table – Roll No- 108, Name- Aadit, Sem1- 470, Sem2-444, Sem3-475, Div – I.
- Increase the SEM2 marks of the students by 3% whose name begins with 'N'.

Ans:

- INSERT INTO RESULT VALUES (108, 'Aadit', 470, 444, 475, 'I');
- UPDATE RESULT SET SEM2=SEM2+ (SEM2*0.03) WHERE SNAME LIKE "N%";

(1 mark for each correct statement)

OR (Option for Part iii only)

iii. Write the statements to:

- Delete the record of students securing IV division.
- Add a column REMARKS in the table with datatype as varchar with 50 characters

Ans:

- DELETE FROM RESULT WHERE DIV='IV';
- ALTER TABLE RESULT ADD (REMARKS VARCHAR(50));

(1 mark for each correct statement)

35	<p>Aman is a Python programmer. He has written a code and created a binary file record.dat with employeeid, ename and salary. The file contains 10 records. He now has to update a record based on the employee id entered by the user and update the salary. The updated record is then to be written in the file temp.dat. The records which are not to be updated also have to be written to the file temp.dat. If the employee id is not found, an appropriate message should be displayed.</p> <p>As a Python expert, help him to complete the following code based on the requirement given above:</p> <pre> import #Statement 1 def update_data(): rec={} fin=open("record.dat","rb") fout=open(" #Statement 2 ") found=False eid=int(input("Enter employee id to update their salary :: ")) while True: try: rec=#Statement 3 if rec["Employee id"]==eid: found=True rec["Salary"]=int(input("Enter new salary :: ")) pickle.#Statement 4 else: pickle.dump(rec,fout)except: break if found==True: print("The salary of employee id ",eid," has been updated.") else: print("No employee with such id is not found")fin.close() fout.close() </pre> <p>i. Which module should be imported in the program? (Statement 1) Ans: pickle (1 mark for correct module)</p> <p>ii. Write the correct statement required to open a temporary file named temp.dat for writing the updated data. (Statement 2) Ans: fout=open('temp.dat', 'wb') (1 mark for correct statement)</p> <p>iii. Which statement should Aman fill in Statement 3 to read the data from the binary file, record.dat and in Statement 4 to write the updated data in the file, temp.dat? Ans: Statement 3: pickle.load(fin) Statement 4: pickle.dump(rec,fout) (1 mark for each correct statement)</p>	
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