

CLASS XII COMPUTER SCIENCE (083)
SAMPLE PAPER – 2 (THEORY) (2020-21)
(SOLVED)

Maximum Marks: 70

Time Allowed: 3 hrs

General Instructions:

1. This question paper contains two parts, A and B. Each part is compulsory.
2. Both Part A and Part B have choices.
3. Part A has 2 sections:
 - (a) Section I is short answer questions, to be answered in one word or one line.
 - (b) Section II has two case study questions. Each case study has 5 case-based sub-parts. An examinee is to attempt any 4 out of the 5 sub-parts.
4. Part B is Descriptive Paper. Part B has three sections:
 - (a) Section I is short answer questions of 2 marks each in which two questions have internal options.
 - (b) Section II is long answer questions of 3 marks each in which two questions have internal options.
 - (c) Section III is very long answer questions of 5 marks each in which one question has internal options.
5. All programming questions are to be answered using Python language only.

PART A – Section I

Select the most appropriate option out of the options given for each question. Attempt any 15 questions from question no 1 to 21.

1. Name the Python Library modules which need to be imported to invoke the following functions: (1)
- | | |
|------------|---------------|
| (i) load() | (ii) cursor() |
|------------|---------------|

Ans. (i) pickle (ii) mysql.connector

2. Identify the keyword and valid identifier. (1)

(i) while (ii) SNo

Ans. (i) while – Keyword (ii) SNo – Identifier

3. Write the output of the given statement: (1)

```
>>> 5%3
```

(i) 1 (ii) 2
(iii) 1.6 (iv) 5

Ans. (ii) 2

4. Name the function which splits the string using a specified separator and returns a tuple with three arguments—substring before separator, separator and substring after separator. (1)

Ans. partition()

5. Differentiate between a text file and a binary file. (1)

Ans. A text file stores data as ASCII/Unicode characters whereas a binary file stores data in binary format.

6. Identify the valid declaration of Month: (1)

```
Month={1:'January',2:'February',3:'March',4:'April'}
```

(i) List (ii) Dictionary
(iii) Array (iv) Tuple

Ans. (ii) Dictionary

7. Given the list: (1)

```
EmpName = ["Jai", "Suraj", "Kajal", "Mamta", "Neeraj"]
```

Which of the following command is used to update the Employee Name from "Mamta" to "Sakshi".

(i) EmpName="sakshi" (ii) EmpName["Mamta"]="Sakshi"
(iii) EmpName[3]="Sakshi" (iv) EmpName[4]="Sakshi"

Ans. (iii) EmpName[3]="Sakshi"





8. Find and write the output of the following Python code: (1)

```
n=45
if (n>50):
    print(n-5)
else:
    print(n+10)
```

Ans. 55

9. Gaining knowledge about someone’s private and sensitive information from their computer illegally is known as (1)

Ans. Hacking

10. A system designed to prevent unauthorized user access to or from a network is termed as (1)

Ans. Firewall

11. Find and write the output of the following Python code: (1)

```
a=20
def call():
    global a
    b=20
    a=a+b
    return a
print(a)
call()
print(a)
```

Ans. 20

40

12. Name the device that enables a computer to transmit data over telephone lines. (1)

Ans. Modem

13. Give one example of Aggregate function. (1)

Ans. Sum()

14. Which of the following is not a DDL command? (1)

- (i) SELECT
- (ii) ALTER
- (iii) CREATE
- (iv) DROP

Ans. (i) SELECT

15. Name the protocol that allows users to share text messages over the internet. (1)

Ans. IRC (Internet Relay Chat)

16. What is the significance of 'w' and 'a' modes? (1)

Ans. 'w' mode is write mode where data will be lost and overwritten while in 'a' mode, i.e., append mode, data will be added at the end of the existing text.

17. Observe the following code and answer the questions that follow: (1)

```
f = open("story.txt", "_____")//blank1
_____#blank2
f.close()
```

- (i) Fill in the blank 1 to write a parameter to open the file in read and write mode.
- (ii) Fill in the blank 2 with a statement to write the contents of file “story.txt” to “story2.txt”.

Ans. (i) 'r+' (ii) f.write("story2.txt")

18. Write a query in SQL to display the list of existing tables in a database. (1)

Ans. `show tables;`

19. Name the protocol that breaks down data into packets and transmits it over the network. (1)

Ans. TCP/IP(Transmission Control Protocol/Internet Protocol)

20. Which of the following type(s) of table constraints will ensure that unique rows should result in output? (1)

- (i) NULL
- (ii) Distinct
- (iii) Unique
- (iv) NOT NULL

Ans. (ii) Distinct

21. Sanya has created a website for her sister to sell the paintings made by her. After completing the website, she wants to upload it on the internet so that anyone can access it from anywhere. Name the process through which it is possible. (1)

Ans. Web Hosting

Section II

Both the case study-based questions are compulsory. Attempt any 4 sub-parts from each question. Each sub-part carries 1 mark.

22. A school named VVPS maintains a database 'School' that contains many tables. One of the tables is Student as shown below:

RollNo	Name	Class	Marks
1	Aarti	XII A	380
2	Neeraj	XI B	410
3	Vinay	XIIC	470
4	Shourya	XIC	390
5	Arpit	XIA	430
6	Shivani	XIIA	270

(a) Identify the attribute that can be declared as Primary Key. (1)

Ans. RollNo

(b) Write the degree and cardinality of the table Student. (1)

Ans. Degree – 4, Cardinality – 6

(c) Write SQL query to add one more column Fees of decimal data type. (1)

Ans. `ALTER TABLE Student
ADD Fees decimal(8,2);`

(d) The Management wishes to increase the fees from the new session by 5%. Which command will they use from the following? (1)

- (i) `Update Student set fees=fees*5/100;`
- (ii) `Update Student change fees=fees+(fees *5/100);`
- (iii) `Update Student set fees=fees+(fees *5/100);`
- (iv) `Update set fees =fees+(fees*5/100) from Student;`

Ans. (iii) `Update Student set fees=fees+(fees *5/100);`

(e) Now the Management wants to display all the tables in School database. Write the query to display the same. (1)

Ans. `Show tables;`

23. Neetu works as an IT expert in VV Infotech Ltd. She has been assigned the job of generating a report to count total number of records of Staff using the "Staff.csv" file. She has written a program to read CSV file "Staff.csv" which contains details of all the staff members. She has written the following code. As an IT expert, help her to successfully execute the given task.





```

import _____ # Line 1
def CountStaff( ): # to read data from the CSV file
    with _____ ('Staff.csv', newline='_____') as f: # Line 2
        csv_reader = csv. _____ (f) # Line 3
        rows=[ ]
        values=0
        for i in csv_reader_:
            if csv_reader.line_num==0:
                continue
            rows.append(i)
            values=len( _____ (csv_reader)) # Line 4
        print("No. of records are:", values)

```

(a) Name the module she should import in Line 1. (1)

Ans. import csv

(b) Write the method that she should use to open the file to read data from it. (1)

Ans. open

(c) Fill in the blank in Line 3 to read the data from a csv file. (1)

Ans. reader

(d) Fill in the blank in Line 4 with the method to convert the data read from the file into list. (1)

Ans. list

(e) Write the full form of CSV. (1)

Ans. Comma Separated Values

PART B – Section I

24. Rewrite the following code in Python after removing all syntax error(s). Underline each correction done in the code. (2)

```

x= int("Enter the Value of x:")
for in range[0,21]:
    if x=y
        print (x+ y)
    else:
        Print(x-y)

```

Ans. x= int(input("Enter the Value of x:"))
 for y in range(0,21):
 if x==y:
 print (x+ y)
 else:
 print(x-y)

25. Differentiate between Circuit Switching and Packet Switching. (2)

OR

Compare 2G and 3G mobile technology.

Ans.

Circuit Switching	Packet Switching
In Circuit switching, there is end-to-end connection established between two computers before any data can be sent.	In Packet switching, there is no direct connection established between two computers.
It reserves the required bandwidth in advance.	It uses bandwidth as and when required by the packets to be transmitted.
It requires dedicated path till the data is completely transferred from sender to receiver.	It requires any dynamic path.
It is a fast mechanism of communication.	It is a slow technique to communicate.

OR

- 3G** (i) It supports web browsing, email, video conferencing, video downloading, picture sharing and live streaming on smartphones.
(ii) It allows the users to play 3D games.
(iii) It provides broadband internet services.
(iv) It provides fast communication at data speed of 144kbps to 2mbps.
- 4G** (i) It provides high quality streaming video and video conferencing.
(ii) It supports interactive multimedia, voice and video services.
(iii) It provides wireless internet and broadband services.
(iv) It provides high data speed of 100mbps to 1gbps.

26. Expand the following terms:

(2)

- (i) HTTP (ii) CDMA
(iii) WAN (iv) Wi-Fi

Ans. (i) Hyper Text Transfer Protocol (ii) Code Division Multiple Access
(iii) Wide Area Network (iv) Wireless Fidelity

27. Write a user-defined function `frequencyCount()` that accepts a dictionary with a list of elements (keys) as arguments and returns the frequency of the element's occurrence in the form of dictionary. (2)

OR

Write a user-defined function with string as a parameter which replaces all vowels in the string with '\$'.

Ans.

```
def frequencyCount(list1,dict):
    for i in list1:
        if i not in dict:
            dict[i]=1
        else:
            dict[i]+=1
    return dict
```

OR

```
def replaceVowel(str):
    newstr=' '
    for ch in str:
        if ch in 'aeiouAEIOU':
            newstr += '$'
        else:
            newstr +=ch
    return newstr
```

28. Write a function `DISPLAYWORDS()` in Python to read lines from a text file `POEM.txt` and display those words which have less than 4 characters. (2)

Ans.

```
def DISPLAYWORDS():
    file= OPEN('POEM.txt','r')
    line= file.read()
    word=line.split()
    for w in word:
        if len(w)<4:
            print(w)
    file.close()
```





29. Study the following program and select the possible output(s) from options (i) to (iv) following it. Also, write the maximum and the minimum values that can be assigned to the variable i. (2)

```
import random
pick = random.randint(0, 3)
color = ['Red', 'Green', 'Blue', 'Orange']
for i in color:
    for j in range(1, pick):
        print(i, end=" ")
    print()
```

- (i) Red
Green
Blue
Orange
- (ii) Red
Green Green
BlueOrange
- (iii) RedGreen
BlueBlue
OrangeOrange
- (iv) RedRed
GreenGreen
BlueBlue
OrangeOrange

Ans. (i) and (iv) are the possible outputs.
Minimum value that can be assigned is X = 0.
Maximum value that can be assigned is Y = 3.

30. What is module in Python? How can you access modules in the program? (2)

Ans. A module is a file containing Python definitions, functions, variables and statements with .py extension. The modules can be accessed using import statement in three different ways.

- (i) `import <module_name>` – It gives access to all functions of the specified module.
- (ii) `from <module_name> import function_name(s)` – It gives access only to specified function(s).
- (iii) `from <module_name> import*` – It gives access to all the functions of specified module.

31. What is the difference between where and having clause when used along with the **Select** statement. Explain with an example. (2)

- Ans. (i) Where clause works with respect to the whole table but having clause works on groups of a table.
- (ii) Where clause is used to filter records before any groupings take place whereas Having is used to filter values after they have been grouped.
- (iii) *For example*, `select * from Employee where Salary>45000;`
For example, `Select job, Sum(Salary) from Employee group by job;`

32. How is a Trojan Horse different from a worm? (2)

Ans.

Trojan Horse	Worms
A Trojan Horse is a program that looks safe but has hidden code that can damage the system by altering or deleting information on the computer in the background.	A worm is a self-replicating program which eats up all the disk space or memory until filled.
Trojans do not replicate themselves but are very destructive.	Worms harm a computer network by consuming bandwidth and slow down the network speed.

33. Find and write the output of the following Python code: (2)

```
def Change(A, B=500):
    A=A+B
    B = A - B
    Print(A, "&&", B)
    Return A
C=1000
D =2000
C= Change(C, D)
print(C, '&&', D)
D=Change(D)
```

Ans. 3000 && 1000
3000 && 2000
2500 && 2000

Section II

34. Write a Python program to find out the size of the file '(Book.txt)' in bytes, number of lines and number of words. (3)

Ans.

```
f=open('Book.txt', 'r')
str=f.read()
size=len(str)
print("Size of file in bytes:", size)
f.seek(0)
Line= f.readlines()
print("Number of lines in file:", Line)
word=Line.split()
print("Number of words:", word)
f.close()
```

35. ABC Infotech Pvt. Ltd. manages the records of its employees that contain empno, ename and salary. Write a program to read and fetch all the records from EMP table having salary more than 25000. (3)

OR

SS Public School is managing the student's data in 'Student' table in 'school' database. Write a Python code that connects to database school and retrieves all records and displays total number of students.

Ans.

```
import mysql.connector
db=mysql.connector.connect(host="Localhost", user="root", password=" ",
database="Company")
cursor=db.cursor()
sql="SELECT * FROM EMP WHERE SALARY>25000"
try:
    cursor.execute(sql)
    resultset=cursor.fetchall()
    for row in resultset:
        empno=row[0]
        ename=row[1]
        salary=row[2]
        print(("empno=%d, ename=%s, salary=%f) % (empno, ename, salary))
except:
    print("Error: unable to fetch data")
db.close()
```

OR

```
import mysql.connector
conn = mysql.connector.connect(host="localhost",user='root', password
                              ='root',database="school")

cursor= conn.cursor()
cursor.execute("Select * from Student")
records = cursor.fetchall()
count=0
for x in records:
    count+=1
    print(x)
    print("Total number of records are:",count)
conn.close()
```



36. Consider the table Employee as shown below. Write commands in SQL for the following queries: (3)

EmpCode	EmpName	EmpSalary	Job_Profile	City
E1001	Umesh Pathak	55000	Asst. Manager	Delhi
E1002	Prashant Puri	65000	Manager	Jaipur
W1003	Manoj Rana	45000	Sales Manager	Kanpur
E1004	Sukriti Pandey	87000	I.T. Head	Jaipur
E1005	Leesha Singh	43000	Sales Accountant	Delhi

(a) Write a query to display the details of employees whose salary is in the range 45000 – 60000.

Ans. `Select * from Employee where EmpSalary between 45000 and 60000;`

(b) Write a query to find the Maximum Salary of employees grouped by City from Employee table.

Ans. `select Max(Salary) from Employee group by City;`

(c) Write a query to display the names of employees who are Manager in any department.

Ans. `select Empname from Employee where EmpName Like '%Manager%';`

37. Write a function in Python, `AddEmp(stk)` and `DelEmp(stk)` to add a new Employee Id and Name and delete the employee, considering them to act as push and pop operations of the Stack data structure. (3)

OR

Consider the following stack of characters implemented as an array of 4 elements:

```
Stack = ["A", "J", "P", "N"]
```

Display the Stack as the following operations take place:

- (a) `Stack.pop()`
- (b) `Stack.append("K")`
- (c) `Stack.append("S")`
- (d) `Stack.pop()`
- (e) `Stack.append("G")`
- (f) `Stack.pop()`

Ans. To Add Employee Id and Name:

```
def Addemp(stk):  
    id=input("enter employee number")  
    ename=input("enter employee name")  
    data=[id,ename]  
    stk.append(data)
```

To Delete Employee detail:

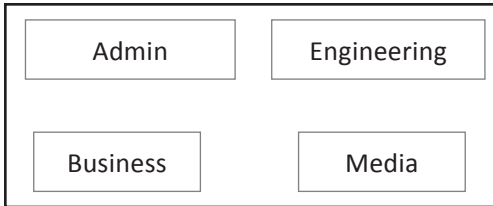
```
def DelEmpl(stk):  
    if(stk==[]):  
        print("Stack Empty")  
    else:  
        print("Deleted element is :",stk.pop())
```

OR

- Ans.** (a) 'N' is popped. ['A','J','P']
(b) ['A', 'J', 'P', 'k']
(c) ['A', 'J', 'P', 'k', 'S']
(d) 'S' is popped. ['A', 'J', 'P', 'k']
(e) ['A', 'J', 'P', 'k', 'G']
(f) ['A', 'J', 'P', 'k']

Section III

38. Excellence Education Institute is an educational organization. It is planning to set up its India campus at Chennai with its head office at Delhi. The Chennai campus has four buildings—Admin, Engineering, Business and Media. (5)



Distances between various buildings are as follows:

Admin to Engineering	55m
Admin to Business	90m
Admin to Media	50m
Engineering to Business	55m
Engineering to Media	50m
Business to Media	45m
Delhi Head Office to Chennai Campus	2175km

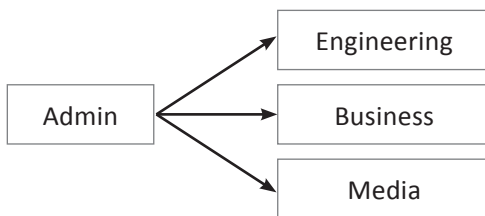
Number of computers:

Admin	110
Engineering	75
Business	40
Media	12
Delhi Head Office	20

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

- (i) Suggest and draw the cable layout to efficiently connect various buildings within the Chennai campus for connecting the computers.

Ans.



- (ii) Suggest the most suitable place (*i.e.*, building) to house the server of this organization.

Ans. The most suitable place for server is Admin as it has the maximum number of computers or Media due to shorter distance from other buildings.

- (iii) Which of the following will you suggest to establish online face-to-face communication between different buildings of the Chennai campus and Delhi Head Office?

- (a) Cable TV (b) Email
(c) Video Conferencing (d) Text Chat

Ans. (c) Video Conferencing

- (iv) What type of network is formed by connecting the Chennai and Delhi head office?

Ans. WAN

- (v) Which device will you suggest to connect each computer of all the buildings of the Chennai branch?

Ans. Switch should be placed in each building to provide connectivity between computers.

39. Write commands for SQL queries STOCK (i) to (iii) and output for (iv) and (v), which are based on the tables STOCK and DEALERS: (5)

STOCK

Itemno	Item	Dcode	Qty	UnitPrice	StockDate
5005	Ball Pen 0.5	102	100	16	31-March-2019
5003	Ball Pen 0.25	102	150	20	01-Jan-2020
5002	Gel Pen Premium	101	125	14	13-Feb-2020
5006	Gel Pen Classic	101	200	22	10-Mar-2019
5001	Eraser small	102	210	5	12-Dec-2019
5004	Eraser big	102	70	10	11-Jan-2020
5009	Sharpener Classic	103	160	8	23-Jan-2020

DEALERS

DCode	Dname
101	Reliable Stationers
102	Classic Plastics
103	Smart Deals

- (i) To display details of all items in the stock and their corresponding dealers in descending order of Unit Price.

Ans. `Select * from STOCK, DEALERS where STOCK.Dcode=DEALERS.Dcode order by UnitPrice desc;`

- (ii) To display Item number, item name of those items from stock table whose Quantity is more than 120.

Ans. `Select Itemno, item from STOCK where qty>120;`

- (iii) To display item name and Maximum unit price of items along with the dealers name.

Ans. `Select Item, MAX(UnitPrice) from STOCK, DEALERS where STOCK.Dcode=DEALERS.Dcode group by Dcode;`

- (iv) `SELECT Count(Distinct Dcode) from Stock;`

Ans. `Count (Distinct Dcode)`
3

- (v) `SELECT Qty * UnitPrice from STOCK where ItemNo=5006;`

Ans. `Qty * UnitPrice`
4400

40. Consider a binary file **Stock.dat** that has the following data: OrderId, MedicineName, Quantity and Price of all the Medicines of Wellness Medicos. Write the following functions: (5)

- (i) `AddOrder()` that can input all the medicine orders.

- (ii) `DisplayPrice()` to display the price of all the medicines that have price > 500.

OR

Create a binary file **funandfood.dat** that can store details of rides such as Ticketno, Ridename, Noofpersons, and Price with the help of `AddRides()` function and write another Python function `DisplayTotal()` to display total amount of each ticket. Also count total number of tickets sold.

Ans. (i) `import pickle`

```
def AddOrder():
    fobj=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, fobj)
    fobj.close()
```

```
(ii) def DisplayPrice():
    fobj=open("Stock.dat", 'rb')
    try:
        while True:
            data=pickle.load(f1)
            if data[3]>500:
                print(data[0],data[1],data[2],data[3], sep="\t")
    except:
        fobj.close()
```

OR

```
import pickle
def AddRides():
    fobj=open("funandfood.dat", 'ab')
    Ticketno=input("Enter Ticket Number")
    RideName=input("Enter Name of the ride")
    No_ofperson=int(input("Enter Number of person:"))
    Price=int(input("Enter Price:"))
    data=[Ticketno, RideName, No_ofperson, Price]
    pickle.dump(data, fobj)
    fobj.close()
def Display():
    f1=open("Stock.dat", 'rb')
    total=0
    count=0
    try:
        while True:
            data=pickle.load(f1)
            total=data[2]*data[3]
            print(data[0],data[1],data[2],data[3],total, sep="\t")
            count=count+1
            print("Total number of Tickets sold are:",count)
    except:
        f1.close()
```

