CBSE Class 12 Computer Science 2021 - Set 4 (Code 91) - Compartment

Question Paper

Conducted by the Central Board of Secondary Education (CBSE)

Time Allowed: 3 Hours **Maximum Marks: 70**

General Instructions

(i) This question paper contains two parts - Part A and Part B. Each part is compulsory.

(ii) Both Part A and Part B have choices.

(iii) Part A Section I has short answer questions to be answered in one word or one line. Attempt any 15 questions from questions 1-21.

(iv) Part A Section II has two compulsory case study questions. Each case study has 5 case-based subparts. Attempt any 4 of the 5 subparts from each question. Each subpart carries 1 mark.

(v) Part B is a descriptive paper with three sections.

(vi) Part B Section I has short answer questions of 2 marks each, in which two questions have internal options.

(vii) Part B Section II has long answer questions of 3 marks each, in which two questions have internal options.

(viii) Part B Section III has very long answer questions of 5 marks each, in which one question has an internal option.

(ix) All programming questions are to be answered using Python language only.

Part A Section I

1. Which of the following options is/are not Python Keywords ?

(A) False (B) Math

(C) WHILE (D) break

2. Given the dictionary D={'Rno': 1, 'Name':'Suraj'} , write the output of print(D('Name')).

3. Identify the statement(s) from the following options which will raise TypeError exception(s) :

(A) print('5' * 3) (B) print(5 * 3)

(C) print('5' + 3) (D) print('5' + '3')

4. Identify the valid relational operator(s) in Python from the following :

(A) = (B) <

(C) <> (D) not

5. For a string S declared as S = 'PYTHON', which of the following is incorrect ?

(A) N=len(S) (B) T = S

(C) 'T' in S (D) S[0] = 'M'

6. Write a single line statement in Python to assign the values 'BLUE', 'GREEN', 'RED' to a tuple named Colours.

7. A List is declared as L = ['ONE', 'TWO', 'THREE']

What will be the output of the statement ?

```
print(max(L))
```

8. Write the name of the built-in function/method of the math module which when executed upon 5.8 as parameter, would return the nearest smaller integer 5.

9. In context of Communication Networks, which of the following is the correct expansion for the abbreviation PAN :

(A) Prime Area Network (B) Post Application Network

(C) Picture Application Network (D) Personal Area Network

10. In context of Cyber Crimes and Cyber Thefts, the term IPR refers to :

(A) Internet Protocol Rights (B) Inter Personnel Rights

(C) Intellectual Property Rights (D) Individual Property Rights

11. In SQL, write the name of the aggregate function which will display the cardinality of a table.

12. Which of the following clauses in SQL is most appropriate to use to select matching tuples in a specific range of values ?

(A) IN (B) LIKE

(C) BETWEEN (D) IS

13. Which of the following is not a valid datatype in SQL ?

(A) DATE (B) STRING

(C) DECIMAL (D) CHAR

14. Which of the following is not a valid DML command in SQL ?

(A) INSERT (B) UPDATE

(C) ALTER (D) DELETE

15. Which of the following wireless transmission media is best suited for MAN ?

(A) Microwave (B) Radio Link

(C) Infrared (D) Bluetooth

16. Which of the following is/are immutable object type(s) in Python ?

(A) List (B) String

(C) Tuple (D) Dictionary

17. What shall be the ouput for the execution of the following Python Code ?

```
Cities = ['Delhi', 'Mumbai']
Cities[0], Cities[1] = Cities[1], Cities[0]
print(Cities)
```

18. Which of the following commands in SQL is used to add a new record into a table ?

(A) ADD (B) INSERT

(C) UPDATE (D) NEW

19. Which of the following is the correct expansion of DML in context of SQL ?

(A) Direct Machine Language (B) Data Mixing Language

(C) Distributed Machine Language (D) Data Manipulation Language

20. Which of the following statements correctly explains the term Firewall in context of Computer Network Society ?

(A) A device that protects the computer network from catching fire. (B) A device/software that controls incoming and outgoing network traffic.

(C) Using abusive language on a social network site. (D) Stealing someone's text and submitting it as his/her own work.

21. Which of the following protocols allows the use of HTML on the World Wide Web ?

(A) HTTP (B) PPP

(C) FTP (D) POP

22. Anmol maintains that database of Medicines for his pharmacy using SQL to store the data. The structure of the table PHARMA for the purpose is as follows :

- Name of the table - PHARMA
- The attributes of PHARMA are as follows :
  MID - numeric
  MNAME - character of size 20
  PRICE - numeric
  UNITS - numeric
  EXPIRY - date

Table : PHARMA

MID	MNAME	PRICE
M1	PARACETAMOL	12
M2	CETRIZINE	6
M3	METFORMIN	14
M4	VITAMIN B-6	12
M5	VITAMIN D3	25
M6	TELMISARTAN	22

MID	UNITS	EXPIRY
M1	120	2022-12-25
M2	125	2022-10-12
M3	150	2022-05-23
M4	120	2022-07-01
M5	150	2022-06-30
M6	115	2022-02-25

22(a). Write the degree and cardinality of the table PHARMA.

22(b). Identify the attribute best suitable to be declared as a primary key.

22(c). Anmol has received a new medicine to be added into his stock, but for which he does not know the number of UNITS. So he decides to add the medicine without its value for UNITS. The rest of the values are as follows :

MID	MNAME	PRICE	EXPIRY
M7	SUCRALFATE	17	2022-03-20

Write the SQL command which Anmol should execute to perform the required task.

22(d). Anmol wants to change the name of the attribute UNITS to QUANTITY in the table PHARMA. Which of the following commands will he use for the purpose ?

(A) UPDATE (B) DROP TABLE
(C) CREATE TABLE (D) ALTER TABLE

22(e). Now Anmol wants to increase the PRICE of all medicines by 5. Which of the following commands will he use for the purpose ?

(A) UPDATE SET (B) INCREASE BY
(C) ALTER TABLE (D) INSERT INTO

23. Roshni of Class 12 is writing a program in Python for her project work to create a CSV file "Teachers.csv" which will contain information for every teacher's Identification Number, Name for some entries. She has written the following code. However, she is unable to figure out the correct statements in a few lines of the code, hence she has left them blank. Help her to write the statements correctly for the missing parts in the code.

```
import _______                          # Line 1
def addrec(Idno, Name): # to add record into the CSV file
    f=open("Teachers.csv", _______)  # Line 2
    Filewriter = CSV.writer(f)
    Filewriter.writerow([Idno,name])
    f.close()
def readfile(): # to read the data from CSV file
    f=open("Teachers.csv", _______)   # Line 3
    FileReader = CSV._______ (f)      # Line 4
    for row in FileReader:
        print(row)
    f._______                         # Line 5
```

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

23(b). In which mode will she open the file to add data into the file in Line 2 ?

23(c). In which mode will she open the file to read the data from the file in Line 3 ?

23(d). File in the blank in Line 4 to read the data from a CSV file.

23(e). Fill in the blank in Line 5 to close the file.

Part B Section I

24. Evaluate the following Python expressions :

1. 2 * 3 + 4 ** 2 − 5 // 2
2. 6 < 12 and not (20 > 15) or (10 > 5)

25. What are cookies in a web browser ? Write one advantage and one disadvantage of enabling cookies in a web browser.

OR

25. Differentiate between the terms Domain Name and URL in context of web services. Also write one example of each to illustrate the difference.

26. Expand the following terms in context of Computer Networks :

1. PPP
2. VoIP
3. GSM
4. WLL

27. Explain the use of positional parameters in a Python function with the help of a suitable example.

OR

27. Explain the use of a default parameter in a Python function with the help of a suitable example.

28. Rewrite the following code in Python after removing all syntax error(s) :

Underline each correction done in the code.

```
Runs = ( 10, 5, 0, 2, 4, 3 )
for I in Runs:
   if I=0:
        print(Maiden Over)
else
        print(Not Maiden)
```

29. What possible output(s) is/are expected to be displayed on the screen at the time of execution of the program from the following code ? Also specify the maximum and minimum value that can be assigned to the variable R when K is assigned value as 2.

```
import random
Signal = [ 'Stop', 'Wait', 'Go' ]
for K in range(2, 0, -1):
  R = randrange(K)
  print (Signal[R], end = ' # ')
```

(A) Stop # Wait # Go # (B) Wait # Stop #

(C) Go # Wait # (D) Go # Stop #

30. What are Tuples in a SQL Table ? Write a suitable example with a SQL Table to illustrate your answer.

31. For the following SQL Table named PASSENGERS in a database TRAVEL:

TNO	NAME	START	END
T1	RAVI KUMAR	DELHI	MUMBAI
T2	NISHANT JAIN	DELHI	KOLKATA
T3	DEEPAK PRAKASH	MUMBAI	PUNE

A cursor named Cur is created in Python for a connection of a host which contains the database TRAVEL. Write the output for the execution of the following Python statements for the above SQL Table PASSENGERS:

```
Cur.execute('USE TRAVEL')
Cur.execute('SELECT * FROM PASSENGERS')
Recs=Cur.fetchall()
for R in Recs:
     print(R[1])
```

32. Write the names of any two constraints and their respective uses in SQL.

33. Write the output for the execution of the following Python code :

```
def change(A):
  S=0
  for i in range(len(A)//2):
      S+=(A[i]*2)
  return S
B = [10,11,12,30,32,34,35,38,40,2]
C = Change(B)
Print('Output is',C)
```

Part B Section II

34. Write the definition of a function Sum3(L) in Python, which accepts a list L of integers and displays the sum of all such integers from the list L which end with the digit 3.

For example, if the list L is passed

```
[ 123, 10, 13, 15, 23]
```

then the function should display the sum of 123, 13, 23, i.e. 159 as follows :

```
Sum of integers ending with digit 3 = 159
```

35. Write the definition of a function ChangeGender() in Python, which reads the contents of a text file "BIOPIC.TXT" and displays the content of the file with every occurrence of the word 'he' replaced by 'she'. For example, if the content of the file "BIOPIC.TXT" is as follows :

```
Last time he went to Agra,
there was too much crowd, which he did not like.
So this time he decided to visit some hill station.
```

The function should read the file content and display the output as follows :

```
Last time she went to Agra,
there was too much crowd, which she did not like.
So this time she decided to visit some hill station.
```

OR

35. Write the definition of a function Count_Line() in Python, which should read each line of a text file "SHIVAJI.TXT" and count total number of lines present in text file. For example, if the content of the file "SHIVAJI.TXT" is as follows :

```
Shivaji was born in the family of Bhonsle.
He was devoted to his mother Jijabai.
India at that time was under Muslim rule.
```

The function should read the file content and display the output as follows :

```
Total number of lines : 3
```

36. Write the outputs of the SQL queries (i) to (iii) based on the relations CUSTOMER and TRANSACTION given below :

Table : CUSTOMER

ACNO	NAME	GENDER	BALANCE
C1	RISHABH	M	15000
C2	AAKASH	M	12500
C3	INDIRA	F	9750
C4	TUSHAR	M	14600
C5	ANKITA	F	22000

Table : TRANSACTION

ACNO	TDATE	AMOUNT	TYPE
C1	2020-07-21	1000	DEBIT
C5	2019-12-31	1500	CREDIT
C3	2020-01-01	2000	CREDIT

```
(i) SELECT MAX(BALANCE), MIN(BALANCE)FROM CUSTOMER
    WHERE GENDER = 'M';
(ii) SELECT SUM(AMOUNT), TYPE FROM TRANSACTION
     GROUP BY TYPE;
(iii) SELECT NAME, TDATE, AMOUNT
      FROM CUSTOMER C, TRANSACTION T
      WHERE C.ACNO = T.ACNO AND TYPE = 'CREDIT';
```

37. Write the definition of a function POP_PUSH(LPop, LPush, N) in Python. The function should Pop out the last N elements of the list LPop and Push them into the list LPush. For example :

If the contents of the list LPop are [10, 15, 20, 30]

And value of N passed is 2,

then the function should create the list LPush as [30, 20]

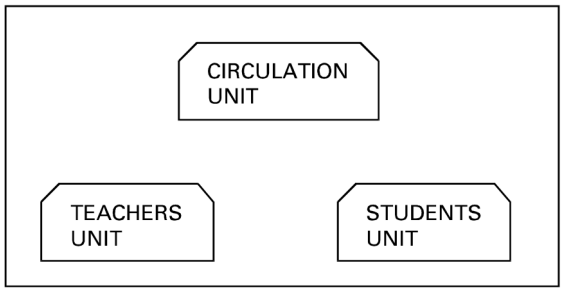
And the list LPop should now contain [10, 15]

NOTE : If the value of N is more than the number of elements present in LPop, then display the message "Pop not possible".

OR

37. Write a function in Python POPSTACK(L) where L is a stack implemented by a list of numbers. The function returns the value deleted from the stack.

38.



A school library is connecting computers in its units in a LAN. The library has 3 units as shown in the diagram below :

The three units are providing the following services :

1. Teachers Unit : For access of the Library Books by teachers
2. Students Unit : For access of the Library Books by Students
3. Circulation Unit : For issue and return of books for teachers and students

Centre to Centre distances between the 3 units are as follows :

38. (continued)

- Circulation Unit to Teachers Unit – 20 metres
- Circulation Unit to Students Unit – 30 metres
- Teachers Unit to Students Unit – 10 metres

Number of computers in each of the units is as follows :

- Circulation Unit 15
- Teachers Unit 10
- Students Unit 10

38. (continued)

1. Suggest the most suitable place (i.e. the Unit name) to install the server of this Library with a suitable reason.
2. Suggest an ideal layout for connecting these Units for a wired connectivity.
3. Which device will you suggest to be installed and where should it be placed to provide Internet connectivity to all the Units ?
4. Suggest the type of the most efficient and economical wired medium for connecting all the computers in the network.
5. The university is planning to connect the Library with the School Principal's computer which is in his office at a distance of 50 metres. Which type of network out of LAN, MAN or WAN will be used for the network ? Justify your answer.

39. Write SQL statements for the following queries (i) to (v) based on the relations CUSTOMER and TRANSACTION given below :

Table : CUSTOMER

ACNO	NAME	GENDER	BALANCE
C1	RISHABH	M	15000
C2	AAKASH	M	12500
C3	INDIRA	F	9750
C4	TUSHAR	M	14600
C5	ANKITA	F	22000

Table : TRANSACTION

ACNO	TDATE	AMOUNT	TYPE
C1	2020-07-21	1000	DEBIT
C5	2019-12-31	1500	CREDIT
C3	2020-01-01	2000	CREDIT

1. To display all information about the CUSTOMERs whose NAME starts with 'A'.
2. To display the NAME and BALANCE of Female CUSTOMERs (with GENDER as 'F') whose TRANSACTION Date (TDATE) is in the year 2019.
3. To display the total number of CUSTOMERs for each GENDER.
4. To display the CUSTOMER NAME and BALANCE in ascending order of GENDER.
5. To display CUSTOMER NAME and their respective INTEREST for all CUSTOMERs where INTEREST is calculated as 8% of BALANCE.

40. A binary file "PLANTS.dat" has structure (ID, NAME, PRICE).

- Write the definition of a function WRITEREC() in Python, to input data for records from the user and write them to the file PLANTS.dat.
- Write the definition of a function SHOWHIGH() in Python, which reads the records of PLANTS.dat and displays those records for which the PRICE is more than 500.

OR

40. A binary file "PATIENTS.dat" has structure (PID, NAME, DISEASE).

Write the definition of a function countrec() in Python that would read contents of the file "PATIENTS.dat" and display the details of those patients who have the DISEASE as 'COVID-19'. The function should also display the total number of such patients whose DISEASE is 'COVID-19'.

- End of Question Paper -