LATEST CBSE
SAMPLE PAPER
Computer Science

Instructions

Time : **3 hrs**   Max. Marks : **70**

1. Please check this question paper contains 35 questions.
2. The paper is divided into 5 Sections A, B, C, D and E.
3. Section A, consists of 18 questions (1 to 18). Each question carries 1 Mark.
4. Section B, consists of 7 questions (19 to 25). Each question carries 2 Marks.
5. Section C, consists of 5 questions (26 to 30). Each question carries 3 Marks.
6. Section D, consists of 2 questions (31 to 32). Each question carries 4 Marks.
7. Section E, consists of 3 questions (33 to 35). Each question carries 5 Marks.
8. All programming questions are to be answered using Python Language only.

■ Section A

1. State True or False. [1]

   "In a Python program, if a break statement is given in a nested loop, it terminates the execution of all loops in one go."

2. In a table in MySQL database, an attribute A of datatype varchar(20) has the value "Keshav". The attribute B of datatype char(20) has value "Meenakshi". How many characters are occupied by attribute A and attribute B? [1]

   (a) 20,6   (b) 6,20   (c) 9,6   (d) 6,9

3. What will be the output of the following statement? [1]

   ```
   print(3-2**2**3+99/11)
   ```
   (a) 244   (b) 244.0   (c) – 244.0   (d) Error

4. Select the correct output of the code. [1]

   ```
   s = "Python is fun"
   l = s.split()
   s_new = "-".join([l[0].upper(), l[1], l[2].capitalize()])
   print (s_new)
   ```
   (a) PYTHON-IS-Fun   (b) PYTHON-is-Fun   (c) Python-is-fun   (d) PYTHON-Is -Fun

5. In MySQL database, if a table, Alpha has degree 5 and cardinality 3, and another table, Beta has degree 3 and cardinality 5, what will be the degree and cardinality of the Cartesian product of Alpha and Beta? [1]

   (a) 5,3   (b) 8,15   (c) 3,5   (d) 15,8

6. Riya wants to transfer pictures from her mobile phone to her laptop. She uses Blueto Technology to connect two devices. Which type of network will be formed in this case?

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

7. Which of the following will delete key-value pair for key = "Red" from a dictionary D1?

(a) delete D1("Red")   (b) del D1["Red"]   (c) del.D1["Red"]   (d) D1.del["Red"]

8. Consider the statements given below and then choose the correct output from the given optio

```
pride="#G20 Presidency"
print(pride[-2:2:-2])
```

(a) ndsr   (b) ceiePO   (c) ceieP   (d) yndsr

9. Which of the following statement(s) would give an error during execution of the following cod

```
tup = (20,30,40,50,80,79)
print(tup)              #Statement 1
print(tup[3]+50)        #Statement 2
print(max(tup))         #Statement 3
tup[4]=80               #Statement 4
```

(a) Statement 1   (b) Statement 2   (c) Statement 3   (d) Statement 4

10. What possible output(s) will be obtained when the following code is executed?

```
import random
myNumber=random.randint(0,3)
COLOR=["YELLOW","WHITE","BLACK","RED"]
for I in range (1, myNumber):
   print(COLOR[I], end = "*")
   print()
```

(a) RED*   (b) WHITE*   (c) WHITE* WHITE*   (d) YELLOW*
     WHITE*   BLACK*   BLACK* BLACK*   WHITE*WHITE*
     BLACK*   BLACK* BLACK* BLACK

11. Fill in the blank.

The modem at the sender's computer end acts as a ....

(a) Model   (b) Modulator   (c) Demodulator   (d) Convertor

12. Consider the code given below:

```
b=100
def test(a):
   ............          # Missing Statement
   b=b+a
   print (a,b)
test (10)
print (b)
```

Which of the following statements should be given in the blank for #Missing Statement, if output produced is 110?

(a) global a   (b) global b=100   (c) global b   (d) global a=100

13. State whether the following statement is True or False.

An exception may be raised even if the program is syntactically correct.

14. Which of the following statement is FALSE about keys in a relational database?   **[1]**

(a) Any candidate key is eligible to become a primary key.

(b) A primary key uniquely identifies the tuples in a relation.

(c) A candidate key that is not a primary key is a foreign key.

(d) A foreign key is an attribute whose value is derived from the primary key of another relation.

15. Fill in the blank.   **[1]**

In case of .... switching, before a communication starts, a dedicated path is identified between the sender and the receiver.

16. Which of the following functions changes the position of file pointer and returns its new position?   **[1]**

(a) `flush()`   (b) `tell()`   (c) `seek()`   (d) `offset()`

Directions Q.Nos. 17 and 18 are Assertion (A) and Reason (R) 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) List is an immutable data type.   **[1]**

Reason (R) When an attempt is made to update the value of an immutable variable, the old variable is destroyed and a new variable is created by the same name in memory.

18. Assertion (A) Python standard library consists of number of modules.   **[1]**

Reason (R) A function in a module is used to simplify the code and avoids repetition.

■ Section B

19. (i) Expand the following terms

POP3 , URL   **[1 + 1 = 2]**

(ii) Give one difference between XML and HTML.

Or

(i) Define the term bandwidth with respect to networks.

(ii) How is http different from https?

20. The code given below accepts a number as an argument and returns the reverse number. Observe the following code carefully and rewrite it after removing all syntax and logical errors. Underline all the corrections made.   **[2]**

```
define revNumber(num):
    rev=0
    rem=0
    While num>0:
        rem == num %10
        rev = rev*10 + rem
        num = num//10
    return rev
print(revNumber(1234))
```

21. Write a function countNow(PLACES) in Python, that takes the dictionary, PLACES as an argument and displays the names (in uppercase)of the places whose names are longer than 5 characters.   **[2]**

For example, consider the following dictionary

```
PLACES={1:"Delhi",2:"London",3:"Paris",4:"New York",5:"Dubai"}
```

The output should be
LONDON
NEW YORK

Or

Write a function, lenWords(STRING), that takes a string as an argument and returns a tup
containing length of each word of a string.
For example, if the string is "Come let us have some fun", the tuple will have (4, 3, 2, 4, 4, 3)

■S

22. Predict the output of the following code:

```
S="LOST"
L = [10, 21, 33, 4]
D={}
for I in range (len(S)):
    if I % 2 == 0:
        D[L.pop()] = S[I]
    else:
        D[L.pop()] = I + 3
for K,V in D.items():
    print (K,V,sep="*")
```

23. Write the Python statement for each of the following tasks using BUILT-IN functions/metho
only

[1 + 1 =

(i) To insert an element 200 at the third position, in the list L1.

(ii) To check whether a string named, message ends with a full stop/period or not.

Or

A list named studentAge stores age of students of a class. Write the Python command to impo
the required module and (using built-in function) to display the most common age value fro
the given list.

24. Ms. Shalini has just created a table named "Employee" containing columns Ename, Departme
and Salary.

After creating the table, she realised that she has forgotten to add a primary key column in th
table. Help her in writing an SQL command to add a primary key column EmpId of integer typ
to the table Employee.

Thereafter, write the command to insert the following record in the table
EmpId- 999
Ename- Shweta
Department: Production
Salary: 26900

Or

Zack is working in a database named SPORT, in which he has created a table named "Sport
containing columns SportId, SportName, no_of_players, and category.

After creating the table, he realised that the attribute, category has to be deleted from the tabl
and a new attribute TypeSport of data type string has to be added. This attribute TypeSpo
cannot be left blank. Help Zack write the commands to complete both the tasks.

25. Predict the output of the following code.

```
def Changer(P,Q=10):
    P=P/Q
    Q=P%Q
    return P
A=200
```

```
B=20
A=Changer(A, B)
print(A,B,sep = '$')
B=Changer(B)
print (A,B,sep='$',end='###')
```

■ Section C

[3]

26. Predict the output of the Python code given below:

```
Text1 = "IND-23"
Text2=""
I=0
while I<len(Text1):
    if Text1[I]>="0" and Text1[I]<="9":
        Val=int(Text1[I])
        Val=Val+1
        Text2=Text2 + str(Val)
    elif Text1[I]>="A" and Text1[I]<="Z":
        Text2=Text2+(Text1[I+1])
    else:
        Text2=Text2 + "*"
    I+=1
print(Text2)
```

27. Consider the table CLUB given below and write the output of the SQL queries that follow.

[1 × 3 = 3]

CID	CNAME	AGE	GENDER	SPORTS	PAY	DOAPP
5246	AMRITA	35	FEMALE	CHESS	900	2006-03-27
4687	SHYAM	37	MALE	CRICKET	1300	2004-04-15
1245	MEENA	23	FEMALE	VOLLEYBALL	1000	2007-06-18
1622	AMRIT	28	MALE	KARATE	1000	2007-09-05
1256	AMINA	36	FEMALE	CHESS	1100	2003-08-15
1720	MANJU	33	FEMALE	KARATE	1250	2004-04-10
2321	VIRAT	35	MALE	CRICKET	1050	2005-04-30

(i) SELECT COUNT(DISTINCT SPORTS) FROM CLUB;

(ii) SELECT CNAME, SPORTS FROM CLUB WHERE DOAPP<"2006-04-30" AND CNAME LIKE "%NA";

(iii) SELECT CNAME, AGE, PAY FROM CLUB WHERE GENDER = "MALE" AND PAY BETWEEN 1000 AND 1200;

28. Write a function in Python to read a text file, Alpha.txt and displays those lines which begin with the word 'You'.

[3]

Or

Write a function, vowelCount() in Python that counts and displays the number of vowels in the text file named Poem.txt.

[1 × 3 = 3]

29. Consider the table Personal given below:

Table: Personal

P_ID	Name	Desig	Salary	Allowance
P01	Rohit	Manager	89000	4800
P02	Kashish	Clerk	NULL	1600
P03	Mahesh	Superviser	48000	NULL
P04	Salil	Clerk	31000	1900
P05	Ravina	Superviser	NULL	2100

Based on the given table, write SQL queries for the following.
(i) Increase the salary by 5% of personals whose allowance is known.
(ii) Display Name and Total Salary (sum of Salary and Allowance) of all personals. The col
heading 'Total Salary' should also be displayed.
(iii) Delete the record of Personal who have salary greater than 25000.

30. A list, NList contains following record as list elements:
[City, Country, distance from Delhi]
Each of these records are nested together to form a nested list. Write the following user-de
functions in Python to perform the specified operations on the stack named travel.
Push_element(NList) It takes the nested list as an argument and pushes a list object contai
name of the city and country, which are not in India and distance is less than 3500 km f
Delhi.
Pop_element() It pops the objects from the stack and displays them. Also, the function sh
display "Stack Empty" when there are no elements in the stack.

For example If the nested list contains the following data

```
NList=[["New York", "U.S.A.", 11734],
["Naypyidaw", "Myanmar", 3219],
["Dubai", "UAE", 2194],
["London", "England", 6693],
["Gangtok", "India", 1580],
["Columbo", "Sri Lanka", 3405]]
```

The stack should contain

```
['Naypyidaw', 'Myanmar'],
['Dubai', 'UAE'],
['Columbo', 'Sri Lanka']
```

The output should be
['Columbo', 'Sri Lanka']
['Dubai', 'UAE']
['Naypyidaw', 'Myanmar']
Stack Empty

■ Section D

31. Consider the tables PRODUCT and BRAND given below:

Table: PRODUCT

PCode	PName	UPrice	Rating	BID
P01	Shampoo	120	6	M03
P02	Toothpaste	54	8	M02
P03	Soap	25	7	M03
P04	Toothpaste	65	4	M04
P05	Soap	38	5	M05
P06	Shampoo	245	6	M05

Table: BRAND

BID	BName
M02	Dant Kanti
M03	Medimix
M04	Pepsodent
M05	Dove

Write SQL queries for the following.

(i) Display product name and brand name from the tables PRODUCT and BRAND.

(ii) Display the structure of the table PRODUCT.

(iii) Display the average rating of Medimix and Dove brands.

(iv) Display the name, price and rating of products in descending order of rating.

32. Vedansh is a Python programmer working in a school. For the Annual Sports Event, he has created a CSV file named Result.csv, to store the results of students in different sports events. **[4]** The structure of Result.csv is :

[St_Id, St_Name, Game_Name, Result]

Where

St_Id is Student ID (integer)

ST_name is Student Name (string)

Game_Name is name of game in which student is participating(string)

Result is result of the game whose value can be either 'Won', 'Lost' or 'Tie'.

For efficiently maintaining data of the event, Vedansh wants to write the following user-defined functions.

Accept() To accept a record from the user and add it to the file Result.csv. The column headings should also be added on top of the CSV file.
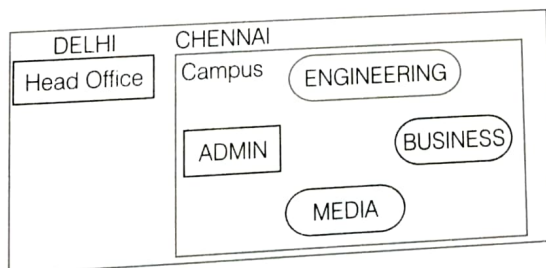
wonCount() To count the number of students who have won any event.

As a Python expert, help him complete the task.

■ Section E

33. Meticulous EduServe is an educational organisation. It is planning to setup its India campus at Chennai with its head office at Delhi. The Chennai campus has 4 main buildings-ADMIN, ENGINEERING, BUSINESS and MEDIA. **[1 × 5 = 5]**

Block to Block distances (in metre)

From	To	Distance
ADMIN	ENGINEERING	55 m
ADMIN	BUSINESS	90 m
ADMIN	MEDIA	50 m
ENGINEERING	BUSINESS	55 m
ENGINEERING	MEDIA	50 m
BUSINESS	MEDIA	45 m
DELHI HEAD OFFICE	CHENNAI CAMPUS	2175 km

Number of computers in each of the blocks/center is as follows:

ADMIN	110
ENGINEERING	75
BUSINESS	40
MEDIA	12
DELHI HEAD	20

(a) Suggest and draw the cable layout to efficiently connect various blocks of buildings with the CHENNAI campus for connecting the digital devices.

(b) Which network device will be used to connect computers in each block to form a local area network?

(c) Which block, in Chennai Campus should be made the server? Justify your answer.

(d) Which fast and very effective wireless transmission medium should preferably be used connect the head office at DELHI with the campus in CHENNAI?

(e) Is there a requirement of a repeater in the given cable layout? Why/Why not?

34. (i) Differentiate between r+ and w+ file modes in Python.   [2+3

(ii) Consider a file, SPORT.DAT, containing records of the following structure

[SportName, TeamName, No_Players]

Write a function, copyData(), that reads contents from the file SPORT.DAT and copies t records with Sport name as "Basket Ball" to the file named BASKET.DAT. The functi should return the total number of records copied to the file BASKET.DAT.

Or

(i) How are text files different from binary files?

(ii) A Binary file, CINEMA.DAT has the following structure:

{MNO:[MNAME, MTYPE]}

Where

MNO-Movie Number

MNAME-Movie Name

MTYPE is Movie Type

Write a user-defined function, findType(mtype), that accepts mtype as parameter a displays all the records from the binary file CINEMA.DAT, that have the value of Movie Ty as mtype.

35. (i) Define the term Domain with respect to RDBMS. Give one example to support your answer
                                                                                    [1+4

(ii) Kabir wants to write a program in Python to insert the following record in the table nam Student in MySQL database, SCHOOL:

• rno(Roll number)- integer
• name(Name) - string
• DOB (Date of birth) - Date
• Fee - float

Note the following to establish connectivity between Python and MySQL:

• Username - root
• Password - tiger
• Host - localhost

The values of fields rno, name, DOB and fee has to be accepted from the user. Help Kabi write the program in Python.

Or

(i) Give one difference between alternate key and candidate key.

(ii) Sartaj has created a table named Student in MySQL database, SCHOOL:
- rno(Roll number)- integer
- name(Name) - string
- DOB (Date of birth)-Date
- Fee-float

Note the following to establish connectivity between Python and MySQL:
- Username - root
- Password - tiger
- Host-localhost

Sartaj, now wants to display the records of students whose fee is more than 5000. Help Sartaj to write the program in Python.

Hints & Solutions

1. False

2. (b) 6, 20

3. (c) – 244.0

4. (b) PYTHON-is-Fun

5. (b) 8,15

6. (a) PAN

7. (b) del D1["Red"]

8. (b) ceieP0

9. (d) Statement 4

10. (b) WHITE *
    BLACK *

11. (b) Modulator

12. (c) global b

13. True

14. (c) A candidate key that is not a primary key is a foreign key.

15. circuit

16. (c) seek()

17. (d) A is false but R is true.   18. (b) Both A and R are true and R is not the correct explanation for A.

19. (i) Post Office Protocol 3, Uniform Resource Locator

(ii) HTML (HyperText Markup Language) uses pre-defined tags while XML (eXtensible Markup Language) uses user-defined tags.

Or

(i) Bandwidth specifically refers to the capacity at which a network can transmit data.

(ii) https uses TLS (SSL) to encrypt normal http requests and responses, and to digitally sign those requests and responses.

20. Correct code is

```
def revNumber(num):
    rev=0
    rem=0
    while num>0:
        rem=num %10
        rev=rev*10+rem
        num=num//10
    return rev
print (revNumber(1234))
```

21.
```
PLACES={1:"Delhi",2:"London",3:"Paris",4:"New York",5:"Dubai"}
def countNow(PLACES):
```

```
    for i in PLACES.values():
        if len(i)>5:
            print(i.upper())
countNow(PLACES)                                    Or


def lenWords(STRING):
    T=()
    L=STRING.split()
    for word in L:
        length = len(word)
        T=T+(length,)
    return T
lenWords("Come let us have some fun")
```

22. 4*L
33*4
21*S
10*6

23. (i) L1.insert(2,200)

(ii) message.endswith('.')

Or

```
import statistics
print( statistics.mode(studentAge) )
```

24. ALTER TABLE Employee ADD EmpId

Integer Primary Key;

INSERT INTO Employee VALUES

(999, "Shweta", "Production", 26900);

Or

ALTER TABLE Sports DROP category;

ALTER TABLE Sports ADD TypeSport char(10) NOT NULL;

25. 10.0$20

10.0$2.0###

26. ND-*34

27. (i)

COUNT(DISTINCT SPORTS)
4

(ii)

CNAME	SPORTS
AMINA	CHESS

(iii)

CNAME	AGE	PAY
AMRIT	28	1000
VIRAT	35	1050

28.
```
def Para():
    fobj = open("Alpha.txt","r")
    data = fobj.readlines()
    for i in data:
```

```
        L = i.split()
        if L[0] == "You":
            print(i)
    fobj.close()
```
<center>*Or*</center>

```
def countVowel():
    fobj = open("Poem.txt","r")
    data = str(fobj.read())
    count=0
    for i in data:
        if i in "aeiouAEIOU":
            count = count+1
    print(count)
    fobj.close()
countVowel()
```

29. (i) UPDATE Personal
    SET Salary=Salary*0.5
    WHERE Allowance IS NOT NULL;

  (ii) SELECT Name, Salary + Allowance AS "Total Salary" FROM Personal;

  (iii) DELETE FROM Personal WHERE Salary > 25000;

30.
```
travel = []
def Push_element(NList):
    for i in NList:
        if i[1]!="India" and i[2]<3500:
            travel.append([i[0],i[1]])
def Pop_element():
    while len(travel):
        print(travel.pop())
    else:
        print("Stack Empty")
```

31. (i) SELECT PName, BName FROM PRODUCT P, BRAND B WHERE P.BID =B.BID;

  (ii) DESC PRODUCT;

  (iii) SELECT BName, AVG(Rating) FROM PRODUCT P, BRAND B WHERE P.BID=B.BID
     GROUP BY BName HAVING BName = "Medimix" OR BName = "Dove";

  (iv) SELECT PName, UPrice, Rating FROM PRODUCT ORDER BY Rating DESC;

32.
```
import csv
def Accept():
    St_Id = int(input("Enter the student ID "))
    St_Name = input("Enter student name ")
    Game_Name = input("Enter the name of game ")
    Result = input("Enter Result ")
    label = ["Student ID", "Student Name", "Game Name", "Result"]
    data = [St_Id, St_Name, Game_Name, Result]
    fobj = open('Result.csv', 'a', newline="")
    wrt = csv.writer(fobj)
    wrt.writerow(label)
    wrt.writerow(data)
    fobj.close()
Accept()
def wonCount():
```
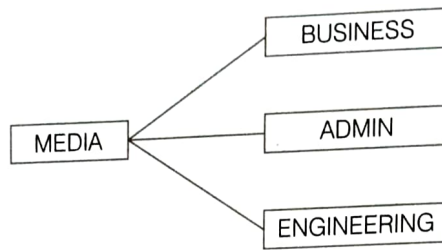
```
fobj = open("Result.csv",'r')
rd = csv.reader(fobj, delimiter=',')
head = list(rd)
print(head[0])
for i in head:
    if i[3] == "WON":
        print(i)
fobj.close()
wonCount()
```

33. (a)

(b) Switch

(c) ADMIN block should be made the server because it has maximum number of computers.

(d) Microwave

(e) No, a repeater is not required in the given cable layout as the length of transmission medium between any two b does not exceed 70 m.

34. (i) Differences between r+ and w+ modes are as follows

r+	w+
Opens a file for both reading and writing. The file pointer placed at the beginning of the file.	Opens a file for both writing and reading. Overwrites the existing file if the file exists.

(ii)
```
def copyData():
    fobj1=open("SPORT.DAT","rb")
    fobj2=open("BASKET.DAT","wb")
    count=0
    try:
        while True:
            data = pickle.load(fobj1)
            print(data)
            if data[0] == "Basket Ball":
                pickle.dump(data, fobj2)
                count = count + 1
    except:
        fobj1.close()
        fobj2.close()
    return count
```

Or

(i) In text files, data is stored in ASCII format that is human readable while in binary files, data is stored in binary form (1s), that is not human readable.

(ii)
```
def findType(mtype):
    fobj = open("CINEMA.DAT","rb")
    try:
        while True:
            data = pickle.load(fobj)
```

```
            if data[2] == mtype:
                print("Movie number:",data[0])
                print("Movie Name:",data[1])
                print("Movie Type:",data[2])
    except EOFError:
    fobj.close()
```

35. (i) A domain is a unique set of values that can be assigned to an attribute in a database. For example, a domain of strings can accept only string values.

(ii)
```
import mysql.connector as mysql
con=mysql.connect(host="localhost",user="root", password="tiger", database="my_database")
cursor = con.cursor()
rno = int(input("Enter the Roll Number: "))
name = input("Enter the name: ")
DOB = input("Enter date of birth: ")
fee = float(input("Enter Fee: "))
query="INSERT INTO Student VALUES ({},'{}','{}',{})".format(rno,name,DOB,fee)
cursor.execute(query)
con.commit()
print("Data entered successfully !!!")
con.close()
```

Or

(i) All keys that have the properties to become a primary key are candidate keys. The candidate keys that do not become primary keys are alternate keys.

(ii)
```
import mysql.connector as mysql
con1 = mysql.connect (host = "localhost", user = "root", passwd = "tiger", database = "sample2023")
mycursor = con1.cursor()
query = "SELECT * FROM STUDENT WHERE FEE > {}".format(5000)
mycursor.execute(query)
data = mycursor.fetchall()
for rec in data:
    print(rec)
con1.close()
```