SET-4

Series ΣHEFG

प्रश्न–पत्र कोड
Q.P. Code **91**

रोल नं.
Roll No.

Candidates must write the Q.P. Code on the title page of the answer-book.

COMPUTER SCIENCE

*Time allowed : **3** hours* *Maximum Marks : **70***

- Please check that this question paper contains **15** printed pages.
- Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains **35** questions.
- **Please write down the serial number of the question in the answer-book before attempting it.**
- 15 minute time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the candidates will read the question paper only and will not write any answer on the answer-book during this period.

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General Instructions :

(i) *This question paper contains five sections,* ***Section A*** *to* ***E.***

(ii) ***All*** *questions are compulsory.*

(iii) ***Section A*** *have* ***18*** *questions carrying* ***1*** *mark each.*

(iv) ***Section B*** *has* ***7*** *Very Short Answer type questions carrying* ***2*** *marks each.*

(v) ***Section C*** *has* ***5*** *Short Answer type questions carrying* ***3*** *marks each.*

(vi) ***Section D*** *has* ***3*** *Long Answer type questions carrying* ***5*** *marks each.*

(vii) ***Section E*** *has* ***2*** *questions carrying* ***4*** *marks each.* ***One*** *internal choice is given in* ***Q. 34 and 35,*** *against Part* ***(iii)*** *only.*

(viii) *All programming questions are to be answered using Python Language only.*

SECTION – A

1. State True or False. **1**

"Identifiers are names used to identify a variable, function in a program".

2. Which of the following is a valid keyword in Python ? **1**

(a) false (b) return

(c) non_local (d) none

3. Given the following Tuple **1**

```
Tup= (10, 20, 30, 50)
```

Which of the following statements will result in an error ?

(a) `print(Tup[0])` (b) `Tup.insert (2,3)`

(c) `print(Tup[1:2])` (d) `print(len(Tup))`

4. Consider the given expression :

```
5<10 and 12>7 or not 7>4
```

Which of the following will be the correct output, if the given expression is evaluated ? **1**

(a) `True` (b) `False`

(c) `NONE` (d) `NULL`

5. Select the correct output of the code : **1**

```
S= "Amrit Mahotsav @ 75"
A=S.partition (" ")
print (a)
```

(a) `('Amrit Mahotsav','@','75')`

(b) `['Amrit','Mahotsav','@','75']`

(c) `('Amrit', 'Mahotsav @ 75')`

(d) `('Amrit', '', 'Mahotsav @ 75')`

6. Which of the following mode keeps the file offset position at the end of the file ? **1**

(a) `r+` (b) `r`

(c) `w` (d) `a`

7. Fill in the blank. **1**

_____ function is used to arrange the elements of a list in ascending order.

(a) `sort()` (b) `arrange()`

(c) `ascending()` (d) `asort()`

8. Which of the following operators will return either True or False ? **1**

(a) `+=` (b) `!=`

(c) `=` (d) `*=`

9. Which of the following statement(s) would give an error after executing the following code ? **1**

```
Stud={"Murugan":100, "Mithu":95}  # Statement 1
print (Stud[95])                  # Statement 2
Stud ["Murugan"]=99               # Statement 3
print(Stud.pop())                 # Statement 4
print(Stud)                       # Statement 5
```

(a) Statement 2 (b) Statement 3

(c) Statement 4 (d) Statements 2 and 4

10. Fill in the blank. **1**

_____ is a number of tuples in a relation.

(a) `Attribute` (b) `Degree`

(c) `Domain` (d) `Cardinality`

11. `The syntax of seek( ) is :` **1**

`file_object.seek(offset[,reference_point])`

What is the default value of `reference_point` ?

(a) 0 (b) 1

(c) 2 (d) 3

12. Fill in the blank : **1**

_____ clause is used with SELECT statement to display data in a sorted form with respect to a specified column.

(a) `WHERE` (b) `ORDER BY`

(c) `HAVING` (d) `DISTINCT`

13. Fill in the blank : **1**

_____ is used for point-to-point communication or unicast communication such as radar and satellite.

(a) `INFRARED WAVES` (b) `BLUETOOTH`

(c) `MICROWAVES` (d) `RADIOWAVES`

14. What will the following expression be evaluated to in Python ? **1**

```
print(4+3*5/3-5%2)
```

(a) `8.5` (b) `8.0`

(c) `10.2` (d) `10.0`

15. Which function returns the sum of all elements of a list ? **1**

(a) `count()` (b) `sum()`

(c) `total()` (d) `add()`

16. fetchall() method fetches all rows in a result set and returns a : **1**

(a) `Tuple of lists` (b) `List of tuples`

(c) `List of strings` (d) `Tuple of strings`

Q. **17** and **18** are ASSERTION (A) and REASONING (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) :** To use a function from a particular module, we need to import the module. **1**

Reason (R) : import statement can be written anywhere in the program, before using a function from that module.

18. **Assertion (A) :** A stack is a LIFO structure. **1**

Reason (R) : Any new element pushed into the stack always gets positioned at the index after the last existing element in the stack.

SECTION – B

19. Atharva is a Python programmer working on a program to find and return the maximum value from the list. The code written below has syntactical errors. Rewrite the correct code and underline the corrections made. **2**

```
def max_num (L) :
    max=L(0)
    for a in L :
      if a > max
      max=a
    return max
```

20. (a) Differentiate between wired and wireless transmission. **2**

OR

(b) Differentiate between URL and domain name with the help of an appropriate example. **2**

21. (a) Given is a Python list declaration : **1**

```
Listofnames=["Aman","Ankit","Ashish","Rajan","Rajat"]
```

Write the output of :

```
print (Listofnames [-1:-4:-1])
```

(b) Consider the following tuple declaration : **1**

```
tup1=(10,20,30,(10,20,30),40)
```

Write the output of :

```
print(tupl.index(20))
```

22. Explain the concept of "Alternate Key" in a Relational Database Management System with an appropriate example. **2**

23. (a) Write the full forms of the following : **2**

(i) HTML

(ii) TCP

(b) What is the need of Protocols ?

24. (a) Write the output of the code given below : **2**

```
def short_sub (lst,n) :
    for i in range (0,n) :
         if len (lst)>4:
            lst [i]=lst [i]+lst[i]
         else:
            lst[i]=lst[i]
subject=['CS','HINDI','PHYSICS','CHEMISTRY','MATHS']
short_sub(subject,5)
print(subject)
```

OR

(b) Write the output of the code given below : **2**

```
a =30
def call (x) :
      global a
      if a%2==0:
           x+=a
      else:
           x-=a
      return x
x=20
print(call(35),end="#")
print(call(40),end= "@")
```

25. (a) Differentiate between CHAR and VARCHAR data types in SQL with appropriate example. **2**

OR

(b) Name any two DDL and any two DML commands. **2**

SECTION – C

26. (a) Consider the following tables – LOAN and BORROWER : **1 + 2**

Table : LOAN

LOAN_NO	B_NAME	AMOUNT
L-170	DELHI	3000
L-230	KANPUR	4000

Table : BORROWER

CUST_NAME	LOAN_NO
JOHN	L-171
KRISH	L-230
RAVYA	L-170

How many rows and columns will be there in the natural join of these two tables ?

(b) Write the output of the queries (i) to (iv) based on the table, WORKER given below :

TABLE: WORKER

W_ID	F_NAME	L_NAME	CITY	STATE
102	SAHIL	KHAN	KANPUR	UTTAR PRADESH
104	SAMEER	PARIKH	ROOP NAGAR	PUNJAB
105	MARY	JONES	DELHI	DELHI
106	MAHIR	SHARMA	SONIPAT	HARYANA
107	ATHARVA	BHARDWAJ	DELHI	DELHI
108	VEDA	SHARMA	KANPUR	UTTAR PRADESH

(i) `SELECT F_NAME, CITY FROM WORKER ORDER BY STATE DESC;`

(ii) `SELECT DISTINCT (CITY) FROM WORKER;`

(iii) `SELECT F_NAME, STATE FROM WORKER WHERE L_NAME LIKE '_HA%';`

(iv) `SELECT CITY,COUNT(*) FROM WORKER GROUP BY CITY;`

27. (a) Write the definition of a Python function named `LongLines( )` which reads the contents of a text file named `'LINES.TXT'` and displays those lines from the file which have at least 10 words in it. For example, if the content of `'LINES.TXT'` is as follows : **3**

Once upon a time, there was a woodcutter

He lived in a little house in a beautiful, green wood.

One day, he was merrily chopping some wood.

He saw a little girl skipping through the woods, whistling happily.

The girl was followed by a big gray wolf.

Then the function should display output as :

He lived in a little house in a beautiful, green wood.

He saw a little girl skipping through the woods, whistling happily.

OR

(b) Write a function `count_Dwords()` in Python to count the words ending with a digit in a text file "`Details.txt`". **3**

Example:

If the file content is as follows :

On seat2 VIP1 will sit and

On seat1 VVIP2 will be sitting

Output will be:

Number of words ending with a digit are 4

28. (a) Write the outputs of the SQL queries (i) to (iv) based on the relations COMPUTER and SALES given below : **2**

Table : COMPUTER

PROD_ID	PROD_NAME	PRICE	COMPANY	TYPE
P001	MOUSE	200	LOGITECH	INPUT
P002	LASER PRINTER	4000	CANON	OUTPUT
P003	KEYBOARD	500	LOGITECH	INPUT
P004	JOYSTICK	1000	IBALL	INPUT
P005	SPEAKER	1200	CREATIVE	OUTPUT
P006	DESKJET PRINTER	4300	CANON	OUTPUT

Table : SALES

PROD_ID	QTY_SOLD	QUARTER
P002	4	1
P003	2	2
P001	3	2
P004	2	1

(i) `SELECT MIN(PRICE), MAX(PRICE) FROM COMPUTER;`

(ii) `SELECT COMPANY, COUNT(*) FROM COMPUTER GROUP BY COMPANY HAVING COUNT(COMPANY) > 1;`

(iii) `SELECT PROD_NAME, QTY_SOLD FROM COMPUTER C, SALES S WHERE C.PROD_ID=S.PROD_ID AND TYPE = 'INPUT';`

(iv) `SELECT PROD_NAME, COMPANY, QUARTER FROM COMPUTER C, SALES S WHERE C.PROD_ID=S. PROD_ID;`

(b) Write the command to view all databases. **1**

29. Write a function EOReplace() in Python, which accepts a list L of numbers. Thereafter, it increments all even numbers by 1 and decrements all odd numbers by 1. **3**

Example :

If Sample Input data of the list is :

```
L=[10,20,30,40,35,55]
```

Output will be :

```
L=[11,21,31,41,34,54]
```

30. (a) A list contains following record of customer:

```
[Customer_name, Room Type]
```

Write the following user defined functions to perform given operations on the stack named `'Hotel'` :

(i) `Push_Cust()` – To Push customers' names of those customers who are staying in 'Delux' Room Type.

(ii) `Pop_Cust()` – To Pop the names of customers from the stack and display them. Also, display "Underflow" when there are no customers in the stack.

For example :

If the lists with customer details are as follows :

```
["Siddarth", "Delux"]
["Rahul", "Standard"]
["Jerry", "Delux"]
```

The stack should contain

```
Jerry
Siddharth
```

The output should be:

```
Jerry
Siddharth
Underflow
```

OR

(b) Write a function in Python, `Push (Vehicle)` where, Vehicle is a dictionary containing details of vehicles – `{Car_Name: Maker}`.

The function should push the name of car manufactured by 'TATA' (including all the possible cases like Tata, TaTa, etc.) to the stack. **3**

For example:

If the dictionary contains the following data:

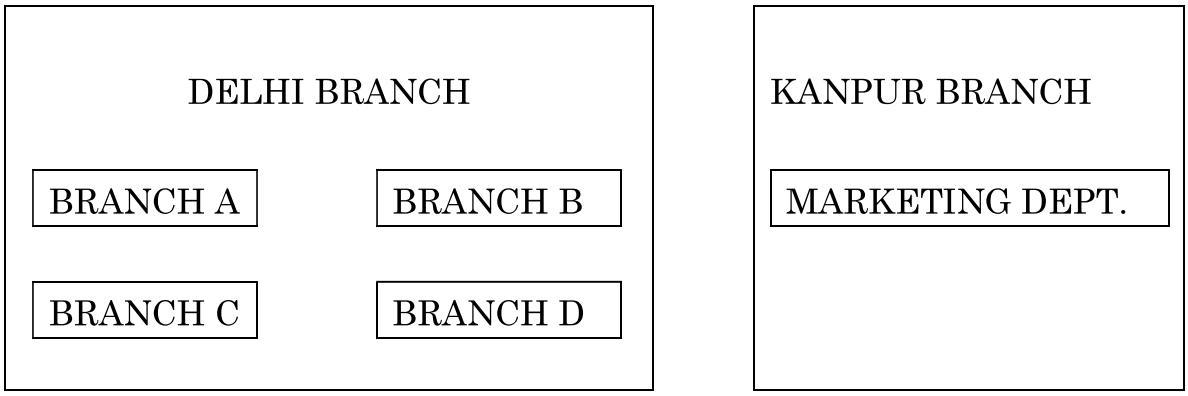
```
Vehicle={"Santro":"Hyundai","Nexon":"TATA","Safari":"Tata"}
```

The stack should contain

```
Safari
Nexon
```

SECTION – D

31. Quickdev, an IT based firm, located in Delhi is planning to set up a network for its four branches within a city with its Marketing department in Kanpur. As a network professional, give solutions to the questions (i) to (v), after going through the branches locations and other details which are given below :



Distance between various branches is as follows :

Branch	Distance
Branch A to Branch B	40 m
Branch A to Branch C	80 m
Branch A to Branch D	65 m
Branch B to Branch C	30 m
Branch B to Branch D	35 m
Branch C to Branch D	15 m
Delhi Branch to Kanpur	300 km

Number of computers in each of the branches :

Branch	Number of Computers
Branch A	15
Branch B	25
Branch C	40
Branch D	115

(i) Suggest the most suitable place to install the server for the Delhi branch with a suitable reason. **1**

(ii) Suggest an ideal layout for connecting all these branches within Delhi. **1**

(iii) Which device will you suggest, that should be placed in each of these branches to efficiently connect all the computers within these branches ? **1**

(iv) Delhi firm is planning to connect to its Marketing department in Kanpur which is approximately 300 km away. Which type of network out of LAN, WAN or MAN will be formed ? Justify your answer. **1**

(v) Suggest a protocol that shall be needed to provide help for transferring of files between Delhi and Kanpur branch. **1**

32. (a) What possible output(s) are expected to be displayed on screen at the time of execution of the following program :

```
import random
M=[5,10,15,20,25,30]
for i in range(1,3):
    first=random.randint(2,5)- 1
    sec=random.randint(3,6)- 2
    third=random.randint(1,4)
    print(M[first],M[sec],M[third],sep="#")
```

(i)
```
10#25#15
20#25#25
```

(ii)
```
5#25#20
25#20#15
```

(iii)
```
30#20#20
20#25#25
```

(iv)
```
10#15#25#
15#20#10#
```

2

(b) The code given below deletes the record from the table employee which contains the following record structure :

`E_code` - String

`E_name` - String

`Sal` - Integer

`City` - String

Note the following to establish connectivity between Python and MySQL :

- Username is `root`
- Password is `root`
- The table exists in a MySQL database named `emp`.
- The details `(E_code,E_name,Sal,City)` are the attributes of the table.

Write the following statements to complete the code :

Statement 1 – to import the desired library.

Statement 2 – to execute the command that deletes the record with `E_code` as 'E101'.

Statement 3 – to delete the record permanently from the database.

```
import __________ as mysql      # Statement 1
def delete( ) :
    mydb=mysql.connect(host="localhost",user="root",
    passwd="root",database="emp")

    mycursor=mydb.cursor( )
    ___________________ # Statement 2
    ___________________ # Statement 3
    print ("Record deleted")
```

3

OR

(a) Predict the output of the code given below :

```
def makenew(mystr):
    newstr=""
    count=0
    for i in mystr:
        if count%2!=0:
             newstr=newstr+str(count)
        else :
              if i.lower():
                newstr=newstr+i.upper()
              else:
                newstr=newstr+i
        count+=1
    print(newstr)
makenew("No@1")
```

2

(b) The code given below reads the following records from the table `employee` and displays only those records who have employees coming from city 'Delhi':

`E_code` - String

`E_name` - String

`Sal` - Integer

`City` - String

Note the following to establish connectivity between Python and MySQL :

- Username is `root`
- Password is `root`
- The table exists in a MySQL database named `emp`.
- The details `(E_code,E_name,Sal,City)` are the attributes of the table.

Write the following statements to complete the code :

Statement 1 – to import the desired library.

Statement 2 – to execute the query that fetches records of the employees coming from city 'Delhi'.

Statement 3 – to read the complete data of the query (rows whose city is Delhi) into the object named `details`, from the table `employee` in the database. **3**

```
import _____ as mysql          # Statement 1
def display():
    mydb=mysql.connect(host="localhost",user="root",
    passwd="root",database="emp")
    mycursor=mydb.cursor()
    _____                      # Statement 2
    details = _____            # Statement 3
    for i in details:
          print (i)
```

33. (a) Write one difference between CSV and text files. **5**

Write a program in Python that defines and calls the following user defined functions :

(i) `COURIER_ADD()`: It takes the values from the user and adds the details to a csv file `'courier.csv'`. Each record consists of a list with field elements as `cid`, `s_name`, `Source`, `destination` to store Courier ID, Sender name, Source and destination address respectively.

(ii) `COURIER_SEARCH()` : Takes the destination as the input and displays all the courier records going to that destination.

OR

(b) Why it is important to close a file before exiting ?

Write a program in Python that defines and calls the following user defined functions : **5**

(i) Add_Book() : Takes the details of the books and adds them to a csv file 'Book.csv'. Each record consists of a list with field elements as `book_ID`, `B_name` and `pub` to store book ID, book name and publisher respectively.

(ii) Search_Book() : Takes publisher name as input and counts and displays number of books published by them.

SECTION – E

34. The school has asked their estate manager Mr. Rahul to maintain the data of all the labs in a table LAB. Rahul has created a table and entered data of 5 labs.

LABNO	LAB_NAME	INCHARGE	CAPACITY	FLOOR
L001	CHEMISTRY	Daisy	20	I
L002	BIOLOGY	Venky	20	II
L003	MATH	Preeti	15	I
L004	LANGUAGE	Daisy	36	III
L005	COMPUTER	Mary Kom	37	II

Based on the data given above answer the following questions :

(i) Identify the columns which can be considered as Candidate keys. **1**

(ii) Write the degree and cardinality of the table. **1**

(iii) Write the statements to : **2**

(a) Insert a new row with appropriate data.

(b) Increase the capacity of all the labs by 10 students which are on 'I' Floor.

OR

(Option for part (iii) only)

(iii) Write the statements to :

(a) Add a constraint PRIMARY KEY to the column LABNO in the table.

(b) Delete the table LAB. **2**

35. Shreyas is a programmer, who has recently been given a task to write a user defined function named `write_bin( )` to create a binary file called `Cust_file.dat` containing customer information – customer number `(c_no)`, name `(c_name)`, quantity `(qty)`, price `(price)` and amount `(amt)` of each customer.
The function accepts customer number, name, quantity and price. Thereafter, it displays the message 'Quantity less than 10..... Cannot SAVE', if quantity entered is less than 10. Otherwise the function calculates amount as `price * quantity` and then writes the record in the form of a list into the binary file.

```
import pickle
def write_bin():
  bin_file=_______ #Statement 1
  while True:
    c_no=int(input("enter customer number"))
    c_name=input("enter customer name")
    qty=int(input("enter qty"))
    price=int(input("enter price"))
    if _______  #Statement 2
      print("Quantity less than 10..Cannot SAVE")
    else:
      amt=price * qty
      c_detail=[c_no,c_name,qty,price,amt]
      _______ #Statement 3
      ans=input("Do you wish to enter more records y/n")
      if ans.lower()=='n':
        _________ #Statement 4
    _____________ #Statement 5
_________________ #Statement 6
```

(i) Write the correct statement to open a file `'Cust_file.dat'` for writing the data of the customer. **1**

(ii) Which statement should Shreyas fill in Statement 2 to check whether quantity is less than 10. **1**

(iii) Which statement should Shreyas fill in Statement 3 to write data to the binary file and in Statement 4 to stop further processing if the user does not wish to enter more records. **2**

OR

(Option for part (iii) only)

(iii) What should Shreyas fill in Statement 5 to close the binary file named `Cust_file.dat` and in Statement 6 to call a function to write data in binary file ? **2**