

Series HFG1E



SET-4

प्रश्न-पत्र कोड
Q.P. Code 91

रोल नं.
Roll No.

2 1 6 5 4 2 7 5

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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P.T.O.

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 : 1
 $5 < 10$ and $12 > 7$ or not $7 > 4$
Which of the following will be the correct output, if the given expression is evaluated?
(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 :  
\_\_\_\_\_ 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 ?  
`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 ?
- (a) `count()` (b) `sum()`  
(c) `total()` (d) `add()`
16. `fetchall()` method fetches all rows in a result set and returns a :
- (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.  
**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.  
**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 :

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

Write the output of :

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

- (b) Consider the following tuple declaration :

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

Write the output of :

```
print(tup1.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 ? 2

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 :

```
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 :

**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".

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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.

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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.

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 :

`["Siddharth", "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.

For example:

If the dictionary contains the following data:

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

The stack should contain

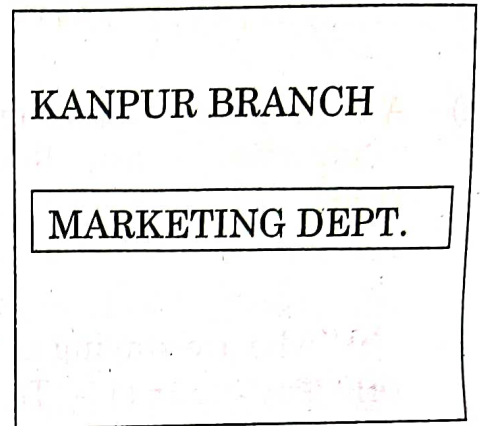
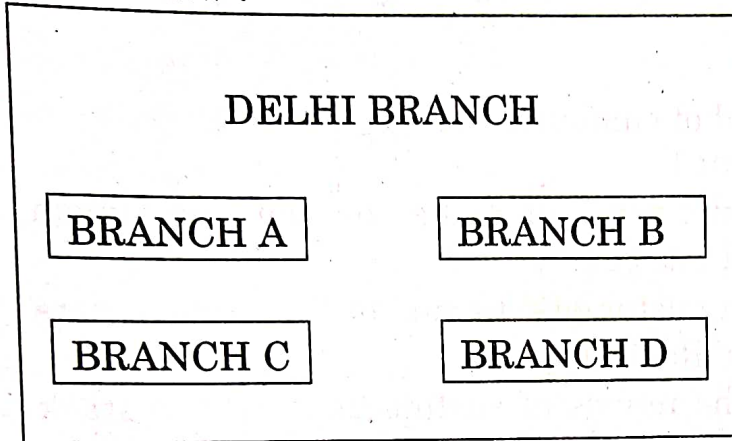
Safari

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.





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

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

(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.

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

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(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   | (ii) 5#25#20   |
| 20#25#25       | 25#20#15       |
| (iii) 30#20#20 | (iv) 10#15#25# |
| 20#25#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.



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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")
```

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")
```





(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
```

```
_____ # Statement 3
```

```
 details = _____
```

```
 for i in details:
```

```
 print (i)
```



33. (a) Write one difference between CSV and text files.  
 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 :
- (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.
- (ii) Write the degree and cardinality of the table.
- (iii) Write the statements to :
  - (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.





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

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?

