



Series ΣHEFG/C



Set-4

Q.P. Code **91**

Roll No.

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

## COMPUTER SCIENCE (NEW)

*Time allowed : 3 hours*

*Maximum Marks : 70*

- Please check that this question paper contains **19** 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 students will read the question paper only and will not write any answer on the answer-book during this period.



### **General Instructions :**

- *This question paper contains five sections, **Section A** to **E**.*
- *All questions are compulsory.*
- ***Section A** has **18** questions carrying **1** mark each.*
- ***Section B** has **7** Very Short Answer (VSA) type questions carrying **2** marks each.*
- ***Section C** has **5** Short Answer (SA) type questions carrying **3** marks each.*
- ***Section D** has **3** Long Answer (LA) type question carrying **5** marks each.*
- ***Section E** has **2** questions carrying **4** marks each. **One** internal choice is given in Q **35** against part **C** only.*
- *All programming questions are to be answered using Python Language only.*



## SECTION A

*All questions carrying 1 mark each.*

$18 \times 1 = 18$

1. State True or False.

“Comments are not executed by interpreter.”

2. Which of the following is **not** a sequential datatype in Python ?

- (a) Dictionary
- (b) String
- (c) List
- (d) Tuple

3. Given the following dictionary

```
Day={1:"Monday", 2: "Tuesday", 3: "Wednesday"}
```

Which statement will return "Tuesday".

- (a) `Day.pop()`
- (b) `Day.pop(2)`
- (c) `Day.pop(1)`
- (d) `Day.pop("Tuesday")`

4. Consider the given expression :

```
7<4 or 6>3 and not 10==10 or 17>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 :

```
S="Amrit Mahotsav @ 75"  
A=S.split(" ",2)  
print(A)  
(a) ('Amrit', 'Mahotsav', '@', '75')  
(b) ['Amrit', 'Mahotsav', '@ 75']  
(c) ('Amrit', 'Mahotsav', '@ 75')  
(d) ['Amrit', 'Mahotsav', '@', '75']
```

6. Which of the following modes in Python creates a new file, if file does not exist and overwrites the content, if the file exists ?

(a) **r+** (b) **r**  
(c) **w** (d) **a**

7. Fill in the blank :

\_\_\_\_\_ is not a valid built-in function for list manipulations.

(a) **count()**  
(b) **length()**  
(c) **append()**  
(d) **extend()**

8. Which of the following is an example of identity operators of Python ?

(a) **is** (b) **on**  
(c) **in** (d) **not in**

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

```
S="Happy" # Statement 1  
print(S*2) # Statement 2  
S+="Independence" # Statement 3  
S.append("Day") # Statement 4  
print(S) # Statement 5  
(a) Statement 2 (b) Statement 3  
(c) Statement 4 (d) Statement 3 and 4
```



**10.** Fill in the blank :

In a relational model, tables are called \_\_\_\_\_, that store data for different columns.

- (a) Attributes
- (b) Degrees
- (c) Relations
- (d) Tuples

**11.** The correct syntax of `tell()` is :

- (a) `tell.file_object()`
- (b) `file_object.tell()`
- (c) `tell.file_object(1)`
- (d) `file_object.tell(1)`

**12.** Fill in the blank :

\_\_\_\_\_ statement of SQL is used to insert new records in a table.

- (a) ALTER
- (b) UPDATE
- (c) INSERT
- (d) CREATE

**13.** Fill in the blank :

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

- (a) Packet
- (b) Graph
- (c) Circuit
- (d) Plot



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

```
print(6/3 + 4**3//8-4)
```

- (a) 6.5
- (b) 4.0
- (c) 6.0
- (d) 4

15. Which of the following functions is a valid built-in function for both list and dictionary datatype ?

- (a) `items()`
- (b) `len()`
- (c) `update()`
- (d) `values()`

16. `fetchone()` method fetches only one row in a ResultSet and returns a \_\_\_\_\_.

- (a) Tuple
- (b) List
- (c) Dictionary
- (d) String

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) :* In Python, a stack can be implemented using a list.  
*Reasoning (R) :* A stack is an ordered linear list of elements that works on the principle of First In First Out (FIFO).

18. *Assertion (A) :* `readlines()` reads all the lines from a text file and returns the lines along with newline as a list of strings.  
*Reasoning (R) :* `readline()` can read the entire text file line by line without using any looping statements.

## SECTION B

19. Ravi, a Python programmer, is working on a project in which he wants to write a function to count the number of even and odd values in the list. He has written the following code but his code is having errors. Rewrite the correct code and underline the corrections made. 2

```
define EOCOUNT(L) :  
    even_no=odd_no=0  
    for i in range(0,len(L))  
        if L[i]%2=0:  
            even_no+=1  
        Else:  
            odd_no+=1  
    print(even_no, odd_no)
```

20. (a) Write any two differences between Fiber-optic cable and Coaxial cable. 2

## OR

(b) Write one advantage and one disadvantage of wired over wireless communication. 2



21. (a) Given is a Python string declaration : 1

```
NAME = "Learning Python is Fun"
```

```
Write the output of: print(NAME[-5:-10:-1])
```

(b) Write the output of the code given below : 1

```
dict1={1: ["Rohit",20], 2: ["Siya",90]}

dict2={1: ["Rahul",95], 5: ["Rajan",80]}

dict1.update(dict2)

print(dict1.values())
```

22. Explain the usage of **HAVING** clause in **GROUP BY** command in RDBMS with the help of an example. 2

23. (a) Write the full forms of the following : 1

- (i) XML
- (ii) HTTPS

(b) What is the use of FTP ? 1

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

```
g=0

def fun1(x,y):
    global g
    g=x+y
    return g

def fun2(m,n):
    global g
    g=m-n
    return g

k=fun1(2,3)
fun2(k,7)
print(g)
```

OR



(b) Write the output of the Python code given below :

```
a=15
def update(x):
    global a
    a+=2
    if x%2==0:
        a*=x
    else:
        a/=x
a=a+5
print(a,end="$")
update(5)
print(a)
```

2

25. (a) Differentiate between **IN** and **BETWEEN** operators in SQL with appropriate examples.

2

**OR**

(b) Which of the following is **NOT** a DML command.

2

DELETE, DROP, INSERT, UPDATE

## SECTION C

26. (a) Consider the following tables – Student and Sport :

Table : Student

ADMNO	NAME	CLASS
1100	MEENA	X
1101	VANI	XI

Table : Sport

ADMNO	GAME
1100	CRICKET
1103	FOOTBALL

What will be the output of the following statement ?

1

```
SELECT * FROM Student, Sport;
```



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

2

TABLE : GARMENT

GCODE	TYPE	PRICE	FCODE	ODR_DATE
G101	EVENING GOWN	850	F03	2008-12-19
G102	SLACKS	750	F02	2020-10-20
G103	FROCK	1000	F01	2021-09-09
G104	TULIP SKIRT	1550	F01	2021-08-10
G105	BABY TOP	1500	F02	2020-03-31
G106	FORMAL PANT	1250	F01	2019-01-06

- (i) `SELECT DISTINCT(COUNT(FCODE)) FROM GARMENT;`
- (ii) `SELECT FCODE, COUNT(*), MIN(PRICE) FROM GARMENT GROUP BY FCODE HAVING COUNT(*)>1;`
- (iii) `SELECT TYPE FROM GARMENT WHERE ODR_DATE >'2021-02-01' AND PRICE <1500;`
- (iv) `SELECT * FROM GARMENT WHERE TYPE LIKE 'F%';`

27. (a) Write a function in Python that displays the book names having 'Y' or 'y' in their name from a text file "Bookname.txt".

3

Example :

If the file 'Bookname.txt' contains the names of following books :

One Hundred Years of Solitude

The Diary of a Young Girl

On the Road

After execution, the output will be :

One Hundred Years of Solitude

The Diary of a Young Girl

**OR**



(b) Write a function **RevString()** to read a textfile “Input.txt” and prints the words starting with ‘O’ in reverse order. The rest of the content is displayed normally. 3

Example :

If content in the text file is :

UBUNTU IS AN OPEN SOURCE OPERATING SYSTEM

Output will be :

UBUNTU IS AN NEPO SOURCE GNITAREPO SYSTEM

(words ‘OPEN’ and ‘OPERATING’ are displayed in reverse order)

28. Write the output of any three SQL queries (i) to (iv) based on the tables COMPANY and CUSTOMER given below : 3

Table : COMPANY

CID	C_NAME	CITY	PRODUCTNAME
111	SONY	DELHI	TV
222	NOKIA	MUMBAI	MOBILE
333	ONIDA	DELHI	TV
444	SONY	MUMBAI	MOBILE
555	BLACKBERRY	CHENNAI	MOBILE
666	DELL	DELHI	LAPTOP

Table : CUSTOMER

CUSTID	CID	NAME	PRICE	QTY
C01	222	ROHIT SHARMA	70000	20
C02	666	DEEPIKA KUMARI	50000	10
C03	111	MOHAN KUMAR	30000	5
C04	555	RADHA MOHAN	30000	11

- (i) **SELECT PRODUCTNAME, COUNT(\*) FROM COMPANY GROUP BY PRODUCTNAME HAVING COUNT(\*) > 2;**
- (ii) **SELECT NAME, PRICE, PRODUCTNAME FROM COMPANY C, CUSTOMER CT WHERE C.CID = CU.CID AND C\_NAME = 'SONY';**
- (iii) **SELECT DISTINCT CITY FROM COMPANY;**
- (iv) **SELECT \* FROM COMPANY WHERE C\_NAME LIKE '%ON%';**



29. Write a function **search\_replace()** in Python which accepts a list L of numbers and a number to be searched. If the number exists, it is replaced by 0 and if the number does not exist, an appropriate message is displayed. 3

Example :

L = [10,20,30,10,40]

Number to be searched = 10

List after replacement :

L = [0,20,30,0,40]

30. A list contains following record of course details for a University :

**[Course\_name, Fees, Duration]**

Write the following user defined functions to perform given operations on the stack named '**'Univ'**' : 3

- (i) **Push\_element()** – To push an object containing the Course\_name, Fees and Duration of a course, which has fees greater than 100000 to the stack.
- (ii) **Pop\_element()** – To pop the object from the stack and display it. Also, display “Underflow” when there is no element in the stack.

For example :

If the lists of courses details are :

["MCA",200000,3]

["MBA",500000,2]

["BA",100000,3]

The stack should contain :

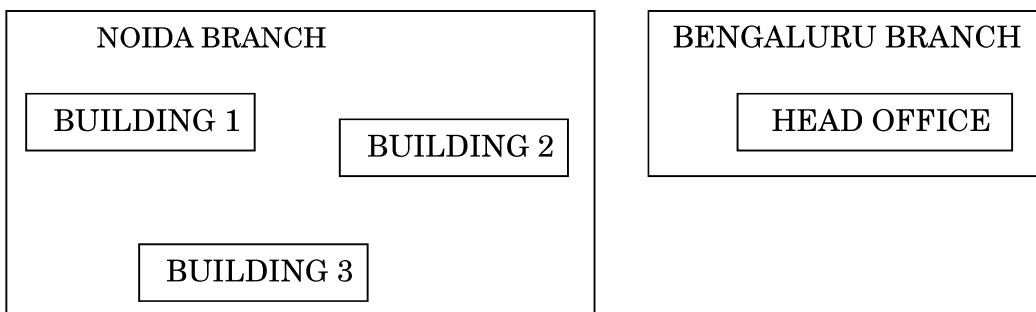
["MBA",500000,2]

["MCA",200000,3]



## SECTION D

31. ABC Consultants are setting up a secure network for their office campus at Noida for their day-to-day office and web-based activities. They are planning to have connectivity between three buildings and the head office situated in Bengaluru. As a network consultant, give solutions to the questions (i) to (v), after going through the building locations and other details which are given below :



Distance between various blocks/locations :

<b>Building</b>	<b>Distance</b>
Building 1 to Building 3	120 m
Building 1 to Building 2	50 m
Building 2 to Building 3	65 m
Noida Branch to Head Office	1500 km

Number of computers

<b>Building</b>	<b>Number of Computers</b>
Building 1	25
Building 2	51
Building 3	150
Head Office	10

(i) Suggest the most suitable place to install the server for this organization. Also, give reason to justify your suggested location. 1

(ii) Suggest the cable layout of connections between the buildings inside the campus. 1



(iii) Suggest the placement of the following devices with justification : 1

- Switch
- Repeater

(iv) The organization is planning to provide a high-speed link with the head office situated in Bengaluru, using a wired connection. Suggest a suitable wired medium for the same. 1

(v) The System Administrator does remote login to any PC, if any requirement arises. Name the protocol, which is used for the same. 1

32. (a) (i) What possible output(s) are expected to be displayed on screen at the time of execution of the following code ? 2

```
import random
S=["Pen","Pencil","Eraser","Bag","Book"]
for i in range (1,2):
    f=random.randint(i,3)
    s=random.randint(i+1,4)

    print(S[f],S[s],sep=":")
```

**Options :**

(I) **Pencil:Book**

(II) **Pencil:Book**  
**Eraser:Bag**

(III) **Pen:Book**  
**Bag:Book**

(IV) **Bag:Eraser**



(ii) The table **Bookshop** in MySQL contains the following attributes :

B\_code – Integer  
B\_name – String  
Qty – Integer  
Price – Integer

Note the following to establish connectivity between Python and MySQL on a ‘localhost’ :

- Username is ‘shop’
- Password is ‘Book’
- The table exists in a MySQL database named **Bstore**.

The code given below updates the records from the table **Bookshop** in MySQL.

3

Statement 1 – to form the cursor object.

Statement 2 – to execute the query that updates the Qty to 20 of the records whose B\_code is 105 in the table.

Statement 3 – to make the changes permanent in the database.

```
import mysql.connector as mysql
def update_book():

    mydb=mysql.connect(host="localhost",
    user="shop",passwd="Book",database="Bstore")
    mycursor=_____ # Statement 1
    qry= "update Bookshop set Qty=20 where
    B_code=105"
    _____ # Statement 2
    _____ # Statement 3
```

**OR**



(b) (i) Predict the output of the code given below :

```
text="LearningCS"
L=len(text)
ntext=""
for i in range (0,L):
    if text[i].islower():
        ntext=ntext+text[i].upper()
    elif text [i].isalnum():
        ntext=ntext+text[i-1]
    else:
        ntext=ntext+'&&'
print(ntext)
```

(ii) The table **Bookshop** in MySQL contains the following attributes :

B\_code – Integer

B\_name – String

Qty – Integer

Price – Integer

Note the following to establish connectivity between Python and MySQL on a ‘localhost’ :

- Username is ‘shop’
- Password is ‘Book’
- The table exists in a MySQL database named **Bstore**.

The code given below reads the records from the table **Bookshop** and displays all the records :

3

Statement 1 – to form the cursor object.

Statement 2 – to write the query to display all the records from the table.



Statement 3 – to read the complete result of the query into the object named **B\_Details**, from the table **Bookshop** in the database.

```
import mysql.connector as mysql
def Display_book():

    mydb=mysql.connect(host="localhost",
    user="shop",passwd="Book",database="Bstore")
    mycursor=_____ # Statement 1
    mycursor.execute("_____") # Statement 2
    B_Details=_____ # Statement 3
    for i in B_Details:
        print(i)
```

33. (a) Write a point of difference between append (a) and write (w) modes in a text file. 5

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

- (i) Add\_Teacher() : It accepts the values from the user and inserts record of a teacher to a csv file ‘Teacher.csv’. Each record consists of a list with field elements as **T\_id**, **Tname** and **desig** to store teacher ID, teacher name and designation respectively.
- (ii) Search\_Teacher() : To display the records of all the PGT (designation) teachers.

**OR**

(b) Write one point of difference between **seek()** and **tell()** functions in file handling. Write a program in Python that defines and calls the following user defined functions : 5

- (i) Add\_Device() : The function accepts and adds records of the peripheral devices to a csv file ‘peripheral.csv’. Each record consists of a list with field elements as **P\_id**, **P\_name** and **Price** to store peripheral device ID, device name, and price respectively.
- (ii) Count\_Device() : To count and display number of peripheral devices, whose price is less than ₹ 1000.



## SECTION E

34. The ABC Company is considering to maintain their salespersons records using SQL to store data. As a database administrator, Alia created the table Salesperson and also entered the data of 5 Salespersons.

Table : Salesperson

S_ID	S_NAME	AGE	S_AMOUNT	REGION
S001	SHYAM	35	20000	NORTH
S002	RISHABH	30	25000	EAST
S003	SUNIL	29	21000	NORTH
S004	RAHIL	39	22000	WEST
S005	AMIT	40	23000	EAST

Based on the data given above, answer the following questions :

(i) Identify the attribute that is best suited to be the Primary Key and why ? 1

(ii) The Company has asked Alia to add another attribute in the table. What will be the new degree and cardinality of the above table ? 1

(iii) Write the statements to : 2

(a) Insert details of one salesman with appropriate data.

(b) Change the Region of salesman 'SHYAM' to 'SOUTH' in the table Salesperson.

### OR (Option for part iii only)

(iii) Write the statement to : 2

(a) Delete the record of salesman RISHABH, as he has left the company.

(b) Remove an attribute REGION from the table.



35. Atharva is a programmer, who has recently been given a task to write a Python code to perform the following binary file operation with the help of a user defined function/module :

- Copy\_new() : to create a binary file `new_items.dat` and write all the item details stored in the binary file, `items.dat`, except for the item whose item\_id is 101. The data is stored in the following format :

{item\_id:[item\_name,amount]}

```
import _____ # Statement 1

def Copy_new():

    f1=_____ # Statement 2

    f2=_____ # Statement 3

    item_id=int(input("Enter the item id"))

    item_detail=_____ # Statement 4

    for key in item_detail:

        if _____: # Statement 5

            pickle._____ # Statement 6

    f1.close()

    f2.close()
```

He has succeeded in writing partial code and has missed out certain statements. Therefore, as a Python expert, help him to complete the code based on the given requirements :



- (i) Which module should be imported in the program ? (Statement 1) 1
- (ii) Write the correct statement required to open the binary file "`items.dat`". (Statement 2) 1
- (iii) Which statement should Atharva fill in Statement 3 to open the binary file "`new_items.dat`" and in Statement 4 to read all the details from the binary file "`items.dat`". 2

**OR (Option for part iii only)**

- (iii) What should Atharva write in Statement 5 to apply the given condition and in Statement 6 to write data in the binary file "`new_items.dat`". 2