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COMPUTER SCIENCE

Full Marks : 70

Time : 3 hours

The figures in the margin indicate full marks for the questions

General Instructions :

- (i) Write all the answers in the Answer Script.
- (ii) Attempt multiple choice questions and very short answer-type questions serially.
- (iii) Attempt all parts of a question together at one place.

1. Choose the correct option from the following : $1 \times 6 = 6$

(a) What is the output of the following code?

```
t=(10, 20, 30, 40, 50, 50, 70)
```

```
print(t[5 : -1])
```

(i) Blank output()

(ii) (50, 70)

(iii) (50, 50, 70)

(iv) (50,)

(2)

(b) If return statement is not used inside the function, the function will return

- (i) 0
- (ii) none
- (iii) an arbitrary integer
- (iv) error ! functions in Python must have a return statement

(c) The readlines() method returns

- (i) an str
- (ii) a list of lines
- (iii) a list of single characters
- (iv) a list of integers

(d) When a stack is empty and an element's deletion is tried from the stack, it is called a/an

- (i) overflow
- (ii) underflow
- (iii) extraflow
- (iv)noflow

(e) Which of the following types of table constraints will prevent the entry of duplicate rows?

- (i) Unique
- (ii) Distinct
- (iii) Foreign key
- (iv) NULL

(3)

(f) To run an SQL query from within a Python program, you may use <cursor>._____ method.

(i) query()

(ii) execute()

(iii) run()

(iv) All of the above

2. Answer the following questions in not more than 2 (two) or 3 (three) sentences each : $1 \times 6 = 6$

(a) Convert the following Infix expression to Prefix expression :

A (B C)

(b) If you give statement del D[<key>], what happens to the value in key : value pairs?

(c) What is variable scope?

(d) What is the role of filemode in file open()?

(e) What is the purpose of using FTP?

(f) What is wrong with the following statement?

```
SELECT * FROM Employee  
WHERE grade=NULL;
```

Write the correct form of the above SQL statement.

(4)

3. Answer any six of the following questions : $2 \times 6 = 12$

(a) Evaluate the following Postfix expression :

50, 60, , 20, 10, ,

(b) Differentiate between Seek() and Tell().

(c) Consider a function with the following header :

def info (object, spacing=10, collapse=1):

Identify the correct function call(s). State the reason(s), if the function call(s) is incorrect.

(i) info (spacing=20)

(ii) info (obj2, 12)

(d) Write any two advantages of saving data in binary form.

(e) Define NameError and ImportError.

(f) What are the basic operations that can be performed on stack?

(g) Find and write the output of the following code :

```
for Name in ['Jayes', 'Ramya', 'Taruna', 'Suraj']:  
    print(Name)  
    if Name[0]=='T':  
        break  
    else:  
        print('Finished!')  
print('Got it')
```

(5)

(h) Fill in the missing lines with appropriate word for creating a CSV file :

```
import _____  
fp=Open("Anyfile.CSV", "_____")  
Wrt=csv._____ (fp)  
_____.Writerow ([1, 'Mary'])  
fp.Close()
```

4. Answer any *three* of the following questions : $2 \times 3 = 6$

(a) What is a transmission media? List any two types of wired and wireless transmission media.

(b) How is IP address different from MAC address?

(c) What is a Modem? What are two types of modems? $1 + 1 = 2$

(d) Differentiate between HTTP and TCP/IP.

(e) Differentiate between Server and Web Server.

5. Answer any *two* of the following questions : $2 \times 2 = 4$

(a) What is SQL constraint? Mention any two constraints. $1 + 1 = 2$

(b) Write the SQL commands to do the following : $1 + 1 = 2$

(i) To view the structure of the table 'student'

(ii) To delete the table 'student'

(c) What is the use of ORDER BY clause? Write query that sorts the data of a table 'student' on the basis of marks in descending order. $1 + 1 = 2$

(6)

6. Answer the following questions : $3 \times 4 = 12$

(a) Explain the use of global keyword used in a function with the help of a suitable example. 3

Or

Predict the output of the following code fragment :

$1+1+1=3$

```
def check(n1=1, n2=2):  
    n1=n1+n2  
    n2+=1  
    print(n1, n2)  
check()  
check(2,1)  
check(3)
```

(b) Write a program to read a text file and display the number of vowels and consonants in the file.

Or

Write a program to create a Binary file to store student data (Rollno, Name, Marks). Obtain data from user and write 5 records into the file.

(c) What is the use of raise statement? Write a code to accept two numbers and display the quotient. Appropriate exception should be raised if the user enter the second number as zero(0). $1+2=3$

Or

What is the utility of the following?

$1+1+1=3$

- (i) Default arguments
- (ii) Keyword arguments
- (iii) Positional arguments

(7)

(d) Write a program in Python that defines and calls the user-defined function to accept and add data of an employee to a CSV file 'record.CSV'. Each record consists of a list with field elements as empid, name and salary to store employee id, employee name and employee salary.

Or

Explain try_except_finally block with an example.

7. Answer any *one* of the following questions : 3

(a) What is network topology? Write any two advantages and disadvantages of star topology.

(b) Define the following network devices briefly : 1+1+1=3

- (i) Repeater
- (ii) Ethernet card
- (iii) Switch

(c) Write a short note on circuit switching and packet switching.

(8)

8. Answer the following questions : 3×3=9

(a) Differentiate between Primary Key and Foreign Key.
Identify the Primary Key and Foreign Key from the tables given below :

Table : STUDENT

Student_ID
Name
Class

Table : PROJECT

Project_ID
Project_Name
Student_ID

Or

Write the SQL queries with reference to the following tables :

Table : PRODUCT

P_ID (PK)
Product_Name
Manufacturer
Price

Table : CLIENT

C_ID (PK)
Client_Name
City
P_ID (FK)

(i) To display Product_Name and Client_Name of those clients whose City is 'Delhi'

(ii) To display the details of Products whose price is in the range of 50 to 100

(iii) To increase the price of all products by 10

(9)

(b) What are the different categories of SQL functions?
Explain COUNT() and SUM(). 1+2=3

(c) What is the significance of GROUP BY Clause in SQL query? Write a query to display the difference of highest and lowest salary of each department from empl table, having maximum salary>4000. 1+2=3

Or

Write a Python database connectivity script that deletes records from 'category' table of database 'item' that have product name 'ICECREAM'. 3

9. Answer the following questions : 4×2=8

(a) Write a program in Python that defines and calls the user-defined function to search the records of the furniture whose price is more than 10000 in a binary file 'furniture.dat' having field fid, fname and fprice.

Or

Write a Python program using function DISPLAYWORDS() to read lines from a text file STORY.TXT, and display those words, which are less than 4 characters.

(10)

(b) Convert the following infix expression into its equivalent postfix expression showing stacks status after every step in tabular form :

$$((A \ B) * (D / E)) / (F * G * H)$$

Or

Write a program using functions in Python, MakePush (package) and MakePop (package) to add a new package and delete a package from a list of package descriptions.

10. Kabir wants to write a program in Python to insert the following record in the 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

Display all records from the table Student.

4

(11)

Or

Given the following table :

Table : CABHUB

VCode	Vehicle-Name	Make	Color	Capacity	Charges
100	Innova	Toyota	WHITE	7	15
102	SX4	Suzuki	BLUE	4	14
104	C-Class	Mercedes	RED	4	35
105	A-Star	Suzuki	WHITE	3	14
108	Indigo	Tata	SILVER	3	12

Give the output of the following queries based on the above table :

- (i) `SELECT COUNT (DISTINCT Make) FROM CABHUB;`
- (ii) `SELECT MAX (Charges), MIN (Charges) FROM CABHUB;`
- (iii) `SELECT VehicleName FROM CABHUB WHERE Capacity=4;`
- (iv) `SELECT COUNT(), MAKE FROM CABHUB;`

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