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HS/XII/A.Sc.Com/CSc/22

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COMPUTER SCIENCE

(Theory)

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 for the following : 1×6=6

(a) The keys of a dictionary must be of ____ types.

- (i) integer
- (ii) mutable
- (iii) immutable
- (iv) Any of these

(b) What is the default return value for a function that does not return any value explicitly?

- (i) None
- (ii) Int
- (iii) Double
- (iv) Null

(2)

(c) Which function is used to write a list of strings in a file?

- (i) writeline()
- (ii) writelines()
- (iii) writestatement()
- (iv) writefullline()

(d) Average Case efficiency means that

- (i) the fastest possible case of the algorithm
- (ii) it tells that the algorithm will never be slower than the the worst case
- (iii) most probable cases of the algorithm will perform like this
- (iv) None of the above

(e) The relational model is concerned with

- (i) data structure and data integrity
- (ii) data manipulation
- (iii) Both (i) and (ii)
- (iv) None of the above

(f) In the given query which keyword has to be inserted?

INSERT INTO employee _____ (1002, Kausar, 2000);

- (i) table
- (ii) values
- (iii) relation
- (iv) field

(3)

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

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

int ("3" + "4")

(b) What all information does a function header give you about the function?

(c) What does **csv.writer** object do?

(d) What is docstring?

(e) What is workstation?

(f) What is equi-join?

3. Answer any six of the following questions : 2×6=12

(a) What is the difference between *formal parameters* and *actual parameters* in the context of user-defined functions?

(b) When do you think *text files* should be preferred over *binary files*?

(c) What is the significance of `newline = ''` argument in the `open()` function of CSV file?

(d) Why is base case so important in a recursive function?

(e) Distinguish between *worst-case* and *best-case complexity* of an algorithm.

(4)

- (f) Write the expression to generate and print a random floating-point number between 85 to 100.
- (g) What is the difference between mutable and immutable objects?
- (h) Convert the following infix expression to prefix :

$$A + B * C - D$$

4. Answer any *three* of the following questions : 2×3=6

- (a) What is the difference between Circuit Switching and Packet Switching technique?
- (b) Define Network Topology. Name any two important factors for choosing a Topology of a Network.
- (c) Define broadband and narrowband.
- (d) Differentiate between XML and HTML.
- (e) What is network protocol? Name any two network protocols.

5. Answer any *two* of the following questions : 2×2=4

- (a) What is SQL constraint? Mention any two constraints.
- (b) What are aggregate functions in SQL?
- (c) What is the use of ORDER BY clause? Write a query that sorts the data of a table STUDENT on the basis of MARKS in descending order.
- (d) Differentiate between char and varchar data types.

(5)

6. Answer the following questions :

3×4=12

- (a) Write a Python program to find the sum of squares of all elements of a list.

Or

Write a recursive function to find the factorial value of a number.

- (b) What will the following code print?

```
def SMeM(a, b, c):  
    return (a - b + c)  
def Exp(p, q, r):  
    return p*q - r  
x = SMeM(5,15,10)  
y = Exp(4,15,2)  
print(x,y)
```

Or

Create a module convs-py having two functions :

- (i) cmtom() : to convert centimeter to meter
- (ii) mtocm() : to convert meter to centimeter

- (c) Convert into postfix :

$((A + B) * C / D + E ** F) / G$

Or

How can you return multiple values from a function? Explain with the help of an example.

- (d) Write a Python program to read a text file and display number of words in the file.

Or

What are the differences between a regular text file and a delimited text file (CSV)? Explain with examples.

(6)

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

- (a) Explain the guided and unguided transmission media.
- (b) Explain the role of Router and Gateway in the context of networking.
- (c) Compare 1G, 2G and 3G networks.

8. Answer any *three* of the following questions : 3×3=9

- (a) Write the SQL commands for the following queries (i) to (iii) based on the relations TEACHER and POSTING.

TEACHER
TID (Primary Key)
Name
Age
Department
DOJ
Salary
Gender

POSTING
PID (Primary Key)
Department
Place

- (i) To show all the records from the table POSTING.
 - (ii) To show all information about the *teacher* of History department.
 - (iii) To list the names of all *teachers* with their date of joining in Ascending order.
- (b) How to implement multiple conditions using WHERE clause? Write the queries from the DOCTOR table.
- (i) The male doctors whose age is between 40 to 50
 - (ii) The female doctors whose OPD-Days are on 'Monday' and 'Friday'

(7)

- (c) What is the significance of GROUP BY clause in a SQL query? From a table STUDENT having fields Stipend and Class, write a query to display the sum of Stipend of each Class.
- (d) What is ORDER BY clause? Write a query to display Sum, Average, and Highest Salary of employees grouped by department number.
- (e) What is database connectivity? Write the connection statement to connect to a database 'BANK'.

9. Answer the following questions :

4×2=8

- (a) What do you understand by *local* and *global scope* of variables? How can you access a global variable inside the function if function has a variable with same name?

Or

Write a program to input following details of sports' performance (sports, competitions, prizes-won) of your school and store into a CSV file.

- (b) Write two functions in Python, **MakePush** (item) and **MakePop** (item) to add a new item and delete an item from the stack data structure.

Or

What are the procedures to execute own library in Python?

10. Write a Python script to accept the **rollno** as parameter and find out whether any record present or not in the MySQL table STUDENTS.

4

(8)

Or

Consider the following table Carhub. Give the output of the following queries (i) to (iv) :

Table : Carhub

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

- (i) SELECT COUNT(DISTINCT Make) from Carhub;
- (ii) SELECT MAX(Charges), MIN(Charges) from Carhub;
- (iii) SELECT COUNT(*), Make from Carhub;
- (iv) SELECT Vehiclename FROM Carhub WHERE CAPACITY = 4;

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