Total No. of Printed Pages—11

HS/XII/A.Sc.Com/CSc/24

2024

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 from the following : 1×6=6

(a) What will be the output of the following code?

```
alist=[]
for i in range (1, 4) :
      alist.append(i)
print(alist)
```

(i) [1]

(ii) [1, 2]

(iii) [1, 2, 3]

(iv) [1, 2, 3, 4]

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(b) What is a variable defined inside a function referred to as?

(i) A static variable

(ii) A global variable

(iii) A local variable

(iv) An automatic variable

(c) The readlines() method returns

(i) a list of lines

(ii) a list of single characters

(iii) a list of integers

(iv) None of the above

(d) Which of the following argument types can be skipped from a function call?

(i) Positional arguments

(ii) Keyword arguments

(iii) Named arguments

(iv) Default arguments

(e) The _____ clause of SELECT query allows us to select only those rows in the result that satisfy a specific condition.

(i) WHERE

(ii) FROM

(iii) HAVING

(iv) LIKE

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(f) The aggregate function sum() when used in a query, a condition can be constructed with _____ clause.

(i) GROUP BY

(ii) WITH

(iii) WHERE

(iv) HAVING

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

(a) Explain type casting by giving an example.

(b) Write the utility of keyword argument in function call statement.

(c) Convert the following infix expression to prefix expression :

$$(A \quad B) \quad C$$

(d) What is the purpose of tell() function?

(e) Gopi Krishna is using a table Employee. It has the following columns :

Code, Name, Salary, Deptcode

Write an SQL query to display the maximum salary on department codewise.

(f) In packet switching, how does data packet travel to the destination?

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

(a) Explain the workings of break and continue statements in the following codings by giving an output for each :

Program 1 :

```
for i in range (1, 5):
    print(i)
    break
```

Program 2 :

```
for i in range (1, 5):
  if(i%2==0):
    continue
    print(i)
  else:
    print(i)
```

(b) When is global statement used? When is its use not recommended?

(c) What is pickling process? What are the two methods for reading and writing pickle module?

(d) What is the difference between writerow() and writerows() function of a .csv file?

(e) What is exception? What is exception handling?

(f) Write the equivalent infix expression for

10, 3, *, 7, 1, , *, 23, +

(g) How can a function return multiple values?

(h) Explain ValueError and ZeroDivisionError.

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

(a) What are the components of a computer network?

(b) Write a short note on ARPnet.

(c) In networking, what is WAN? How is it different from LAN?

(d) Explain any *two* of the following devices :

(i) Switch

(ii) Repeater

(iii) Router

(iv) Bridge

(e) Differentiate between the terms Domain name and URL in the context of World Wide Web.

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

(a) Write a query to list the details of all employees whose annual salary is between 25,000–40,000. Consider the table EMP having columns ID, F_NAME, LAST_NAME and SALARY.

(b) Write an SQL statement to modify the Last_Name of an employee having ID equals to 3 of the EMP table to 'Gautam'.

(c) Differentiate between Primary key and Unique key. Write down the names of clauses of SQL SELECT command used for sorting of data and grouping of data on a particular column.

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6. Answer the following questions : 3×4=12

(a) Explain function header. What is the difference between the function calls CalSum() and CalSum(x, y)? Also name the different types of arguments used in a function header. 1+1+1=3

Or

Write the output of the code given below : 3

```
X=8
def FN(Y, Z=3):
        global X
        X=Z Y**3
        print(X)
FN(3, 6)
FN(Z=7, Y=1)
```

(b) Predict the output of the following code for the given function calls :

(i) divide(2, 1)

(ii) divide(2, 0)

(iii) divide("2", "1")

```
def divide(X, Y) :
    try :
        result=X/Y
except ZeroDivisionError :
        print("division by zero!")
else :
        print("result is", result)
finally :
        print("executing finally clause")
```


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Or

"Every syntax error is an exception but every exception cannot be a syntax error." Justify the sentence.

(c) Write a program to read a text file and display the number of lower-case and upper-case letters present in the file.

Or

Trace the flow of execution for the following program :

```
1. def sum (x=10):
2. print (x+2+6)
3. def add (a, b)
4. return a+b
   #main
5. num=2
6. p=sum()
7. q=add (num, 90)+add(2, 2)
8. print(p, q)
```

(d) Write down the complete open statements for opening the following files :

(i) A text file "example.txt" in both read and write mode.

(ii) A binary file "bfile.dat" in write mode.

(iii) A text file namely "story.txt" in append mode.

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7. Answer the following question : 3

What are the three categories of wired media? Explain them briefly.

Or

What is switching? Discuss packet and circuit switching technologies.

Or

What is protocol? Name and explain at least three network protocols used.

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

(a) Write the SQL queries with reference to the following tables :

Table : DEPT

D_Code (PK)
Department
City

Table : WORKER

W_Code (PK)
Name
DOJ
DOB
Gender
D_Code (FK)

(i) To display W_Code, Name, Gender in descending order of W_Code

(ii) To display Name, Department, City whose W_Code < 1004

(iii) To count and display Male worker who have DOJ > '1986-01-01'

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Or

Differentiate between candidate key and alternate key. Identify the candidate key and alternate key from the table below :

Table : Project

Roll_No
Project
Student_ID
Mobile_No

(b) Explain the difference between the three SQL queries given below as per the table empl :

Table : empl

Emp_no	E_Name	JOB	Salary
1	Smith	Clerk	800
2	Anya	Salesman	1600
3	Seth	Manager	2985
4	Bina	Salesman	1250
5	Amir	Manager	2850

(i) mysql>SELECT COUNT(*) FROM empl;

(ii) mysql>SELECT COUNT (JOB) FROM empl;

(iii) mysql>SELECT COUNT (DISTINCT JOB) FROM empl;

(c) Explain the aggregate functions max(), avg() and sum() with suitable examples.

Or

What is SQL join? Explain equi-join with example.

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

(a) Write a program to create a binary file to store Employee data (Emp_ID, Name, Salary). Obtain at least three records from the user.

Or

Write a function in Python that counts the number of words starting with letter 'S' in a text file "Poem.txt".

(b) Convert ((A+B)*C/D+E**F)/G into postfix notation.

Or

What is a stack? Explain the PUSH and POP operations that can be performed on stack with example.

10. Write a Python code to connect a MySQL database 'CLUB' and insert into MEMBER (M_ID, Name, Activity) values ('M1001', 'Amina', 'swimming'). 4

Or

Given the following table :

Table : Sports

No.	Name	Class	Game	Grade
1	Sameer	7	Cricket	B
2	Sujit	8	Tennis	A
3	Kamal	7	Swimming	B
4	Venna	7	Tennis	C
5	Archana	9	Basketball	A
6	Arpit	10	Cricket	D

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

(i) SELECT Name, Game FROM Sports WHERE Grade='A';

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(ii) SELECT COUNT (DISTINCT Game) FROM Sports WHERE Class<9;

(iii) SELECT Name FROM Sports WHERE Grade BETWEEN 'A' and 'C';

(iv) SELECT DISTINCT Game FROM Sports; 4

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