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HS/XII/A.Sc.Com/CSc/NC/20

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COMPUTER SCIENCE

(New Course)

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) Which of the following keywords marks the beginning of a function block in Python?

(i) func

(ii) define

(iii) def

(iv) function

(b) Which one of the following statements returns an error while importing 'Pyplot' interface of 'Matplotlib' library?

(i) import matplotlib.pyplot

(ii) import matplotlib.pyplot as plt

(iii) from matplotlib import pyplot as plt

(iv) from matplotlib.pyplot as plt

(c) Assume that 30 employees are working in a Bank. Each employee has been allotted a separate workstation to work and all these workstations are connected through the server. These workstations are distributed over two floors of the same building. In each floor, workstations are connected to a switch. Identify the type of network used in the Bank.

(i) Personal Area Network (PAN)

(ii) Local Area Network (LAN)

(iii) Wide Area Network (WAN)

(iv) Peer-to-Peer (P2P) Network

(d) _____ is a unique address consisting of numbers separated by dots and is used for identifying a device on the TCP/IP protocol.

(i) Web address

(ii) DNS

(iii) IP address

(iv) MAC address

(e) Which SQL statement allows you to find the highest 'price' (column) from the table 'Book'?

(i) SELECT Maximum(price) FROM Book;

(ii) SELECT MAX(price) FROM Book;

(iii) SELECT COUNT(price) FROM Book;

(iv) Both *(i)* and *(ii)*

(f) Excessive use of Internet affects the mental health of a person, such condition is termed as _____ by doctors.

(i) cybercrime

(ii) identity theft

(iii) Internet addiction

(iv) online stealing

2. Answer the following questions in not more than *2* (two) or *3* (three) sentences : 1×5=5

(a) Write the most appropriate list method to add an element in the beginning of the list.

(b) Mention any two advantages of computer network.

(c) What measures do wireless networks employ to avoid collisions?

(d) Name any two types of cables that can be used in a wired network.

(e) What is the use of ORDER BY clause in SQL SELECT statement?

3. Answer the following questions : 2×5=10

(a) What are base case and recursive case in a recursive program?

(b) From the program code given below, identify function header, function call, actual argument and formal parameter :

```
def area(r) :
    ar = 3.14 * r * r
    return ar
#_main_
x=2
result = area(x)
```

Or

Predict the output of the following recursive code :

```
def func1 (a):
    if a==1 :
        return 1
    else:
        return a*a+func1(a – 1)
#_main_
n = 5
y = func1(n)
print (y)
```

(c) What are data structures? Name two common data structures.

(d) How can you generate random number using random( ) and randint( ) methods of random module?

(e) Define Big-O notation.

4. Answer the following questions in brief : 2×3=6

(a) Differentiate between Hub and Switch.

(b) What are the steps followed in checksum generator?

(c) What are the symptoms of network congestion?

5. Answer the following questions : 2×3=6

(a) Explain about HTTP GET request and POST request in a web client-server architecture.

Or

How can you activate virtual environment for Django project?

(b) **Satyam Joshi** is using a table 'Employee'. It has the following columns (fields) :

emp_code, emp_name, emp_salary and dept_code

He wants to display number of employees from each department. He wrote the following command :

SELECT dept_code COUNT(emp_code) FROM Employee;

But he did not get the desired result. Rewrite the above query with necessary changes to help him get the desired output.

(c) What is the difference between a **WHERE** clause and a **HAVING** clause of SQL SELECT statement?

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

(a) How can you open a data file in write mode, read mode and append mode? Explain with examples.

(b) Convert the infix expression (A+B) × C/D into postfix notation.

Or

Write a linear search algorithm to search an element in a linear list (array).

(c) What is a line graph? Which function is used for drawing a line graph in Python using Pyplot interface of Matplotlib library? How can you add title and axes names for line graph?

7. Suppose you have created a Django project namely 'School'. It contains three apps in it :

(a) Admission

(b) Exam

(c) Fees

What will be the structure of Django project folder? Only list the folder, do not list any file inside app folder. 3

Or

What is the use of ORDER BY clause? Write a query that sorts the data of table 'Student' on the basis of Project-Group (in ascending order); Section (in descending order), Marks (in descending order).

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

(a) What are online scams? What measures will you take to avoid online scams?

(b) What role has new age media played in things like online campaigns, crowdsourcing and smart mobs?

Or

What is computer forensics? What important practices are followed in computer forensics?

(c) How can you protect yourself against identity theft?

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

a) What are the three types of formal arguments/ parameters that are supported by Python? Explain each in brief.

(b) Write a program to create a data file which accepts rollno, name and percentage of marks for 'N' number of students from a user and display all the entered records.

Or

Write a program using recursive function to implement binary seach algorithm.

10. Explain about two main types of modulation. 4

Or

Explain the role of TCP and IP protocol on a network.

11. Write a Python code to connect to a MySQL database namely 'Bank' and then fetch all those records from the table 'Employee' where salary > 40,000. 4

Or

Given the following table :

Table : CLUB

Coach_ID	Coach-Name	Age	SPORTS	DateofApp	Pay (₹)	Sex
1	Kukreja	35	Karate	27/03/1996	1,000	M
2	Ravina	34	Karate	20/01/1998	1,200	F
3	Karan	34	Squash	19/02/1998	2,000	M
4	Tarun	33	Basketball	01/01/1998	1,500	M
5	Zubin	36	Swimming	12/01/1998	750	M
6	Ketaki	36	Swimming	24/02/1998	800	F
7	Ankita	39	Squash	20/02/1998	2,200	F
8	Zareen	37	Karate	22/02/1998	1,100	F
9	Kush	41	Swimming	13/01/1998	900	M
10	Shailya	37	Basketball	19/02/1998	1,700	M

Give the output of following SQL statements :

(a) SELECT COUNT (DISTINCT SPORTS) FROM CLUB;

(b) SELECT MIN(Age) FROM CLUB WHERE Sex='F';

(c) SELECT AVG(Pay) FROM CLUB WHERE SPORTS= 'Karate';

(d) SELECT SUM(Pay) FROM CLUB WHERE DateofApp > '31/01/1998';

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