

2024
COMPUTER SCIENCE
(Theory)

Full Marks : 70

Pass Marks : 21

Time : Three hours

All the questions are compulsory.

The figures in the right margin indicate full marks for the questions.

Select the correct answer from each of the following and rewrite it.

1. The process of pickling in Python includes : 1
 - A. conversion of a Python object into byte stream
 - B. conversion of a list into a datatable
 - C. conversion of a byte stream into Python object
 - D. conversion of a datatable into a list

2. In a stack, if a user tries to remove an element from empty stack is called : 1
 - A. Overflow
 - B. Empty
 - C. Crash
 - D. Underflow

P.T.O.

3. A set of possible data values is called : 1
- A. attribute
 - B. domain
 - C. tuple
 - D. degree
4. Key to represent relationship between tables is called : 1
- A. Foreign key
 - B. Secondary key
 - C. Composite key
 - D. Primary key
5. Which of the following function returns the total number of values? 1
- A. MAX
 - B. MIN
 - C. COUNT
 - D. SUM
6. A group of two or more similar things or people interconnected with each other is called : 1
- A. Gateway
 - B. Communication
 - C. Network
 - D. Hub

7. A user wants to upload a text document at the rate of 10 pages per 20 second. What will be the required data rate of the channel? (Assume that 1 page contains 1600 characters and each character is of 8 bits) 1
- A. 6400 Kbps
B. 6.25Kbps
C. 6.4Kbps
D. 6.5Kbps

Give the very short answer of the following questions :

8. "Every syntax error is an exception but every exception cannot be syntax error". Justify the statement. 1
9. Write any one application of Queue in real life. 1
10. What is the pre-condition of applying binary search algorithm? 1
11. Write the formula for Standard deviation. 1
12. What is Constraint in database? 1
13. What is database schema? 1
14. If R1 is a relation with 10 rows and 7 columns, then what will be the cardinality of R1? 1
15. Give the syntax of DESCRIBE table. 1
16. A Company wants to form a network on their five computers to a server within the company premises. Represent star topologies diagrammatically for this network. 1
17. Miss Sonia owns a factory which manufactures Fancy Cloth items. Suggest her the advantages of having a web page for her factory. 1

Give short answer of the following questions :

18. Write the Python code to create a text file test.txt and write data in it. 2
19. What are different operations performed on Stack? 2
20. How is queues different from deque? 2
21. List some commonly used DBMS software packages. 2
22. Observe the following table carefully and write the names of the most appropriate columns, which can be considered as (i) primary key and (ii) candidate keys. 2

Item_code	Item_name	Size	Qty.
p1	XYZ	13×11	1000
p2	abc	10×10	2000
p3	pqr	6×6	300
p4	uvw	7×9	500

23. What is the use of UPDATE command in SQL? Give the syntax of UPDATE command. 2
24. Identify the type of topology from the following : 2
- a. Each node is connected with the help of a single cable.
- b. Each node is connected to the next, forming a loop.
25. How is Snooping different from Eavesdropping? 2
26. Draw a block diagram of Half duplex and Full duplex Communication. 2

Give answer of the following questions :

27. Define the following :

3

- (a) Exception Handling
- (b) Throwing an exception
- (c) Catching an exception

OR

3

Define the following :

- (a) File
- (b) Text file
- (c) Binary file

28. Write the user defined function in Python for ENQUEUE and DEQUEUE operation in a queue.

3

OR

Write the user defined function to check whether the given string is palindrome or not, using deque.

3

29. Write an algorithm for Binary search method.

3

OR

Write an algorithm for Bubble Sort method.

3

30. Define the following terms :

3

- (a) Mean
- (b) Median
- (c) Mode

OR

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P.T.O.

Define the following terms :

3

- (a) Data collection
- (b) Structured data
- (c) Unstructured data

31. Why foreign keys are allowed to have NULL values? Explain with an example.

3

OR

How will you drop a constraint from a table ?

3

Give the answer of the following questions :

32. Write a Python program to reverse a string using stack.

5

OR

Write a Python program to search an item in a list using linear search method.

5

33. Write a Python program to sort a list of numbers in ascending order using selection sort method.

5

OR

Write a Python program to sort a list of numbers using insertion sort method.

5

34. (a) Site any one difference between Single Row Function and Aggregate Functions.

5

(b) What is the use of WHERE clause in SQL?

(c) Consider a table PRODUCT having fields Code, Name, Price, Manufacturer. Write the SQL commands :

(i) List the Product Code, Product Name and Price in descending order of their product name.

(ii) Add a new Column named "Discount" to the table PRODUCT.

(iii) Increase the price by 12 per cent for all the products manufactured by Dove.

OR

(a) Explain the like operator in pattern matching.

5

(b) Consider the two relations given below :

R1	
Name	Marks
W	40
X	45
Y	55
Z	65

R2	
Name	Marks
A	58
B	59
C	60
X	45

Find : $R1 \cup R2$

$R1 \cap R2$

$R1 - R2$

35. Answer the following questions :

5

- What is data communication?
- What are the main components of data communication?
- Name two switching techniques used to transfer data between two terminals.
- Which transmission media carries signals in the form of light?

OR

- Write the two properties of Radio Waves.
- Which wireless technology is commonly used in mobile phone?
- What is protocol in data communication?
- Write the Full Form of TCP.

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