



ST. FRANCIS DE SALES COLLEGE

A FRANSALIAN INSTITUTE OF HIGHER EDUCATION **AUTONOMOUS**

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END SEMESTER EXAMINATION – MAY 2025

COMPUTER SCIENCE – II SEMESTER BCA

24BCA23 – DATA STRUCTURES

Time: 3 Hours

Max. Marks: 80

Instruction: Answer should be written completely in English

SECTION – A

Answer any FIVE questions. Each question carries TWO marks.

(5X2=10)

1. What is a non-linear data structure? Give two examples.
2. What are the different types of string-matching algorithm?
3. Define a circular linked list with example.
4. State multidimensional array with example.
5. Define Priority Queue with example.
6. Define Prefix expression with example.
7. What is directed graph? Give an example.
8. What are the applications of trees in computer science?

SECTION -B

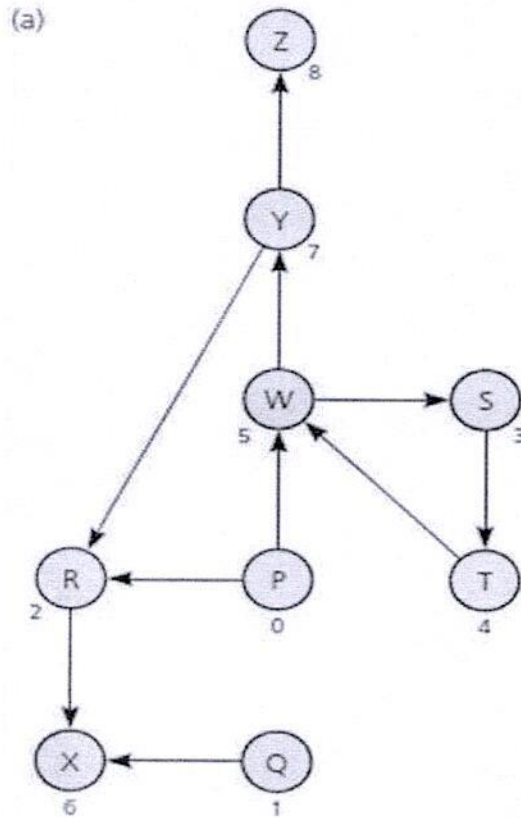
Answer any SIX questions. Each question carries FIVE marks.

(6X5=30)

9. Differentiate between time and space complexity of an algorithm with an example.
10. Explain Brute Force Algorithm with suitable example.
11. Describe the GetNode() and FreeNode() operations in the context of linked lists.
12. Write a program to find the addition of two matrices using arrays.
13. Write a recursive program to find GCD of 4,6,8.
14. Write the algorithms for PUSH and POP operations.
15. Evaluate the following post-fix expression using stack $2\ 3\ 8\ 2\ /\ * + 5\ 2\ * -$



16. Write the adjacency matrix and adjacency list for the following graph



SECTION – C

Answer any FIVE questions. Each question carries EIGHT marks.

(5X8=40)

17. Explain different operations that are performed on data structures.
18. Demonstrate the memory representation of a two-dimensional array. Explain how row-major and column-major orders are applied.
19. What is linked list? Explain different types of linked list.
20. Write an algorithm to perform all operations in queue.
21. What is heap sort? Convert the following to a heap 16, 4, 7, 1, 12, 19.
22. Construct a binary search tree with the elements {2,5,1,3,9,0,6} and perform in-order, pre-order and post-order traversal.

