K24U 3586

Reg. No. : .....

Name : .....

III Semester B.Sc. Degree (C.B.C.S.S. – O.B.E. – Regular) Examination, November 2024

(2023 Admission)

GENERAL AWARENESS COURSE IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

3A02AIML : Data Structures

Time : 3 Hours Max. Marks : 40

PART – A

(Short Answer)

Answer **all** questions. **Each** question carries **1** mark. (6×1=6)

1. What is a data structure ?
2. Write down any two applications of stack.
3. What is a tree data structure ?
4. What is minimum spanning tree ?
5. What are the operations performed on a linked list ?
6. Define a binary tree.

PART – B

(Short Essay)

Answer **any six** questions. **Each** question carries **2** marks. (6×2=12)

7. What is a linked list, and how does it differ from an array ?
8. What are the advantages and disadvantages of a Binary Search Tree (BST) ?
9. What is hashing ?

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10. Convert (A * B+(C/D))-F to a prefix expression.
11. How are stacks and queues different in terms of structure and operations ?
12. Define adjacency matrix in the context of graph.
13. What is a binary tree, and how does it differ from a binary search tree?
14. Define insertion sort.

PART – C
(Essay)

Answer **any 4** questions. **Each** question carries **3** marks. **(4×3=12)**

15. Define infix, prefix, postfix expressions.
16. What are the steps involved in deleting the first node from a linked list ?
17. Compare and contrast Depth-First Search (DFS) and Breadth-First Search (BFS) in graph.
18. How can we traverse a binary tree ? Explain.
19. Write an algorithm or program for traversing a doubly linked list.
20. Explain linear searching with linked list.

PART – D
(Long Essay)

Answer **any two** questions. **Each** question carries **5** marks. **(2×5=10)**

21. Explain the working of a selection sort using 29, 10, 14, 37, 13 as example.
22. Explain sparse matrix representation with operations.
23. Explain complete binary tree with an example.
24. Explain organization and operations on queue with an example.

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