Roll No. .....

97674

BCA 3 years 4th Semester

Examination – May - 2025

DATA STRUCTURE - II

Paper : BCA-207

Time : Three hours] *[Maximum Marks : 80*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : There shall be 9 questions. Question Number 1 will be ***compulsory*** and in addition to the ***compulsory*** question, students have to attempt ***four*** more questions selecting ***one*** from each Unit. All questions shall carry equal marks.

1. (a) What is General Tree ? $8 \times 2 = 16$

(b) What is AVL Tree ?

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(c) What is Topological sorting ?

(d) What is Linear Search ?

(e) What is Complexity ?

(f) What is Sequential Tree ?

(g) What is Fixed Length records ?

(h) What is Heap Sort ?

UNIT – I

2. What is a tree in data structures ? How are searching, insertion, and deletion operations performed in a BST ? Support your explanation with an example. 16

3. What is a B+ Tree in data structures ? Describe how searching, insertion, and deletion operations are performed in a B+ Tree. Explain with an appropriate example. 16

UNIT – II

4. Define a graph in the context of data structures. How is Warshall's algorithm applied to find the shortest paths between nodes ? Illustrate the process with an example. 16

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5. What is a graph in the context of data structures ? Describe how Dijkstra's algorithm is used to compute the shortest path between nodes in a graph. Illustrate the algorithm with an example. 16

UNIT – III

6. What are the commonly used algorithms for sorting and searching in data structures ? Explain the principles and procedures of Quick Sort, Merge Sort, and Radix Sort, including examples for each. 16

7. What is binary search in data structures ? Describe its working mechanism step by step. In which scenarios is binary search preferred over linear search ? Explain. 16

UNIT – IV

8. What is a file in the context of data storage. What are the different types of files used in computing ? Describe any three file types with appropriate examples. 16

9. (a) What is Hashing and what are its purpose in Data Structures ? Explain the commonly used hashing functions. 12

(b) Describe any collision resolution technique with a suitable example. 4

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