(180-CU-404021) Roll No. .....

PAPER ID—10597

B.C.A. EXAMINATION, 2024

(Fourth Semester)

DATA STRUCTURE-II

Code : BCA-207

Time : 3 Hours *Maximum Marks : 80*

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

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

(Compulsory Question)

1. (a) What is B + tree ?
   (b) Write any *two* applications of trees.
   (c) What is topological sorting ?
   (d) Discuss the complexity of linear search algorithm.
   (e) Write any *two* features of B trees.
   (f) Explain any *two* operations which can be performed on files.
   (g) Briefly differentiate between fixed length and variable length records.
   (h) Write any *two* advantages of hashing. **16**

Unit I

2. What do you understand by an m-way search tree ? What are the steps involved in deleting a node from an m-way search tree ? Explain the implementation of algorithm with the help of an example. **16**

3. (a) Explain the role of threads in binary search tree. 8

(b) Explain how is search operation performed in a B tree with the help of a suitable example. 8

Unit II

4. What do you mean by shortest path ? Explain Dijkstra algorithm for finding shortest path with suitable example. 16

5. Explain the following with examples :

(a) Graphs and applications of Graphs in real life 8

(b) Depth First and Breadth First Traversals of Graphs. 8

Unit III

6. (a) Compare and contrast various sorting algorithms based on their complexity. 8

(b) Discuss the Heap Sort algorithm with its relative merits and demerits. 8

7. Explain the following with the help of examples :

(a) Merge Sort 8

(b) Binary Search. 8

Unit IV

8. Explain the following with examples :

(a) Sequential, Indexed Sequential and Random-Access File Structures 8

(b) Uses and Advantages of Multi List File System. 8

9. What are Collisions ? How can collisions be harmful ? What are the various techniques of collision resolution ? Explain with the help of examples. 16