[Nov - 24]

GITAM (Deemed to be University)

GST/GSS/GSB/GSHSS Degree Examination

V/VII Semester

CSEN3151 : ADVANCED DATA STRUCTURES

Time: 2 Hours **Max. Marks: 30**

Instruction: All parts of the unit must be answered in one place only.

Section - A

1. Answer all questions **(5x1=05)**

a. List different types of Double-ended queues (deques).

b. Given a simple hash function h(x) = x % 8, what is the hash value of x = 23?

c. In a B-tree of order m, what is the minimum number of keys a non-root node can have?

d. In the context of external sorting, what does I/O operation refer to?

e. Explain the trade-offs between Trie depth and memory usage.

Section - B

Answer the following **(5x5=25)**

UNIT - I

2. Write a recursive algorithm for binary search on a sorted array.

OR

3. Explain the concept of a priority queue and give an example of a real-world application where a priority queue is used.

UNIT - II

4. Explain extendible hashing and how it addresses the problem of dynamic resizing in hash tables.

OR

5. Explain the process of insertion in a skip list. How is the level of a new node determined?

UNIT - III

6. Differentiate the M-way tree and M-way search tree.

OR

7. Write an insertion algorithm for a binary search tree.

UNIT - IV

8. Explain the adjacency matrix representation of a graph in memory with an example. Discuss its advantages and disadvantages.

OR

9. What is the difference between a spanning tree and a minimum spanning tree (MST)? Explain with an example.

UNIT - V

10. Describe the basic structure and components of a Trie. Explain how it stores and retrieves strings.

OR

11. Explain the Brute-Force pattern-matching algorithm with an example.