Duration: 3hrs **[Max Marks:80]**

N.B. : (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

1 Attempt any FOUR **[20]**
- a Differentiate between Linear and Non-Linear Data Structure.
- b Explain enqueue and dequeue operation in a linear queue.
- c Explain the representation of a linked list and its types.
- d Explain time complexity and space complexity.
- e Write an algorithm for bubble sort.

2 a Explain the implementation of a queue using arrays? How to handle overflow and underflow conditions in a queue implemented using arrays? Can a circular queue be implemented using arrays? **[10]**

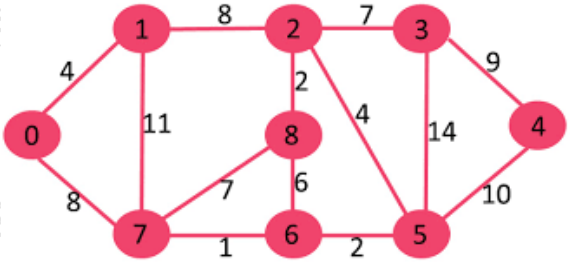
b Explain in detail circular and double ended queue **[10]**

3 a Write the algorithm to traverse a linked list, perform insertion at beginning and insertion before a node in a singly linked list. **[10]**

b Demonstrate BFS with example. **[10]**

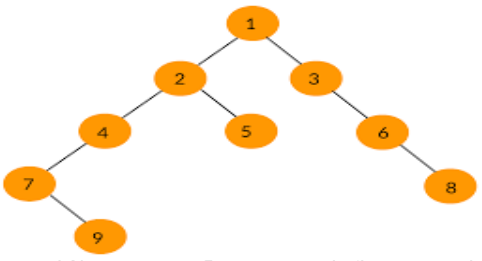
4 a Apply Huffman Coding on "ENGINEERING". **[10]**

b Apply Prim's and Kruskal's Algorithm on the following graph: **[10]**



5 a Demonstrate the algorithm for Binary Search with the following example. **[10]**
63, 82, 94, 77, 53, 87, 23, 55, 10, 44 . key = 44

b Demonstrate the different tree traversal algorithms with the following example. **[10]**



6 a A Using linear probing insert the following values in a hash table of size 10. Show how many collisions occurred in each iteration. **[10]**
28,55,71,67,11,10,90,44

b Explain quick sort with an example **[10]**

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