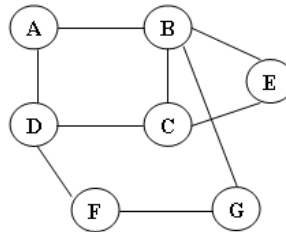


Duration:3 Hours

Total Marks: 80

- N.B:** (1) Question No. 1 is compulsory.  
 (2) Attempt any three questions out of the remaining five questions.  
 (3) Figures to the right indicate full marks.  
 (4) Make suitable assumptions wherever necessary with proper justifications.

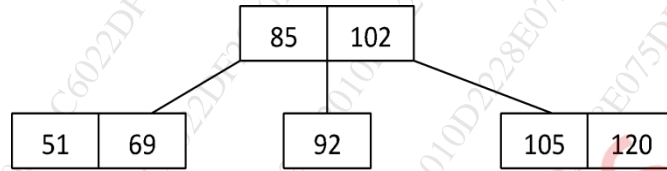
- Q.1. A) Define ADT with an example. [05]  
 B) Evaluate the postfix expression “94\*28+-” using stack ADT. Show the process stepwise. [05]  
 C) Justify the statement with suitable example: “Circular queue overcomes the disadvantage of linear queue”. [05]  
 D) Differentiate between linear search and binary search. [05]
- Q.2. A) Construct Huffman tree and determine the code for each symbol in the string “BCAADDCCACACAC”. [10]  
 B) Discuss the cases of deleting a node from Binary Search Tree with suitable example. [10]
- Q.3. A) Write a program in C to implement queue ADT using linked list. [10]  
 B) Construct an AVL tree by inserting the following elements in the given order. Apply necessary rotations wherever required. [10]  
 54, 12, 24, 68, 85, 99, 42, 27, 87, 80
- Q.4. A) Write C function for BFS graph traversal. Show the stepwise BFS traversal with the help of data structures for the following graph: [10]



- B) Write functions in C to perform the following operations on the Doubly Linked List: [10]  
 i) Delete a node after given node.  
 ii) Find node with smallest data value.  
 iii) Display the list.  
 iv) Insert a node at the end of the list.
- Q.5. A) Build a Binary Search Tree, given the following sequences: [05]  
 Inorder: 35, 41, 48, 52, 57, 72, 79, 85, 86, 90  
 Preorder: 57, 41, 35, 52, 48, 90, 72, 85, 79, 86  
 B) What is topological sort? Explain Topological Sorting with an example. [05]

- C) What is collision? Using linear probing, insert the following values in the hash table of size 11 & count the no. of collisions: [10]  
83, 53, 64, 25, 39, 96, 12, 71.

- Q.6. A) Write short note on Priority Queue. [05]  
B) Write a function in C to count the number of nodes in Singly Linked List. [05]  
C) Create a B-tree of order 3 by inserting 87, 94, 59, 98, 63, 7, 27. [10]



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