

Q.P. Code :02535

[Time: Three Hours]

[Marks:100]

Please check whether you have got the right question paper.

- N.B:**
- 1) Question No. 1 is compulsory.**
 - 2) Attempt any four questions out of remaining six questions.**
 - 3) All questions carry equal marks.**

- Q.1 A)** Given the set of symbols and corresponding frequency table as below, explain the steps to find Huffman Code **[10]**

Symbol	A	B	C	D	E	F	G	H
Frequency	45	13	12	16	9	5	2	1

- B)** Define Priority Queue. Write an algorithm to **[10]**
- i) Insert an element in the priority queue.
 - ii) Delete an element from priority queue.

- Q.2 A)** Define an expression tree. For the following infix expression, draw the expression tree and find prefix and postfix expression. **[10]**
 $A*B/(C-D)+E*(F-G)$

- B)** For circular linked list write algorithms to **[10]**
- i) Insert an element in the list
 - ii) Search for an element in the list

- Q.3 A)** What is sorting? Sort the following elements using Quick sort method **[10]**
22, 12, 32, 2, 15, 25, 10. Also give the algorithm and efficiency for the same.

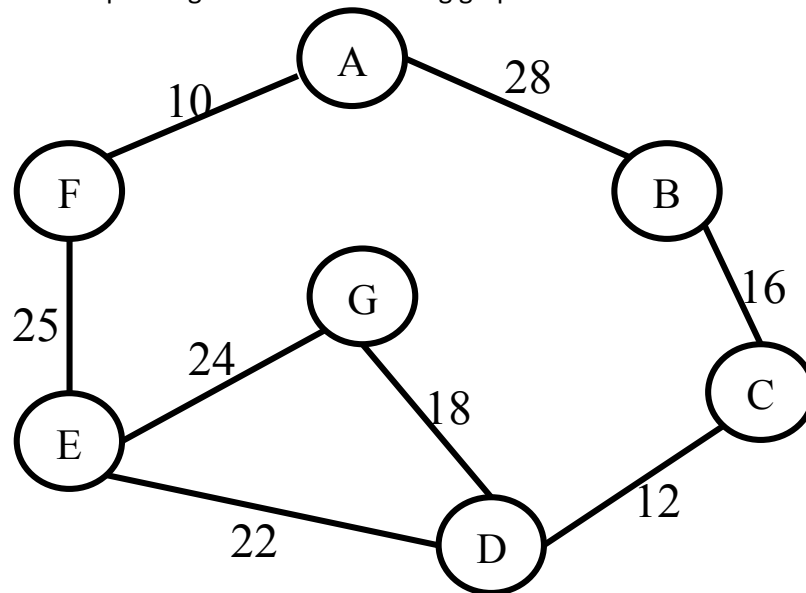
- B)** What is Stack data structure? Explain it with suitable example. Write an algorithm for Push, Pop, Stackempty and Stackfull functions. **[10]**

- Q.4 A)** Define an AVL tree. What is the advantage of using AVL trees? Create an AVL tree using the following data entered as a sequential set. **[10]**
F, V, E, W, D, X, C, Y, B, Z, A.

- B)** Explain collision resolution and its techniques in context of hashing. **[10]**

[TURN OVER]

- Q.5 A) What is minimum spanning tree? Write Kruskal's algorithm to find minimum spanning tree and determine minimum spanning tree of the following graph [10]



- B) Define the efficiency of an algorithm. Explain the process of analysis of an algorithm as well as the notations used (Big O, Ω , θ) [10]

- Q.6 A) What is heap? Write an algorithm for ReheapUp. [10]
Construct a Max heap for the following data values arriving in sequence 35, 33, 42, 10, 14, 19, 27, 44, 26, 31.

- B) What is a Binary Search Tree (BST)? Write an algorithm to [10]
i) Insert a node in BST
ii) Find the smallest node in the BST

- Q.7 A) Define M-way trees. Construct a B-Tree of order 3 by inserting numbers from 1 to 10. [10]

- B) Write a short note on (any two) [10]
i) Doubly linked list
ii) Dijkstra's algorithm
iii) General trees

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