

Total No. of Questions—8]

[Total No. of Printed Pages—3

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S.E. (E&TC/Electronics) (Sem. I) EXAMINATION, 2019

DATA STRUCTURES AND ALGORITHMS

(2015 PATTERN)

Time : Two Hours

Maximum Marks : 50

N.B. :— (i) Neat diagrams must be drawn wherever necessary.

(ii) Figures to the right indicate full marks.

(iii) Assume suitable data, if necessary.

1. (a) Sort the following data using selection sort : [6]

25, 8, 10, 23, 32, 14, 13.

(b) Write 'C' function with and without pointer to arrays to copy one string into another string. [6]

Or

2. (a) Explain parameter passing by value and parameter passing by reference with suitable example. [6]

(b) Write 'C' function for binary search. Discuss its time complexity. [6]

3. (a) Define Queue. Explain its implementation using any *one* method. [5]

P.T.O.

- (b) Write a function PUSH in 'C' for stack using array. [4]
- (c) Differentiate singly linked list and doubly linked list. [4]

Or

- 4. (a) Write 'C' function to delete node from singly linked list. [5]
- (b) Write a short note on circular linked list. [4]
- (c) Compare stack with queue. [4]

- 5. (a) Construct the Binary Search Tree (BST) from the following elements. Show all steps : [6]

12, 50, 35, 30, 13, 45, 7.

- (b) Define the following terms with example with respect to Binary Tree : [6]

- (i) Height of Tree
- (ii) Strictly Binary Tree
- (iii) Complete Binary Tree.

Or

- 6. (a) Write 'C' function to insert node in BST (Binary Search Tree). [6]
- (b) Write inorder, preorder, postorder traversal for the following tree. (Figure 1). [6]

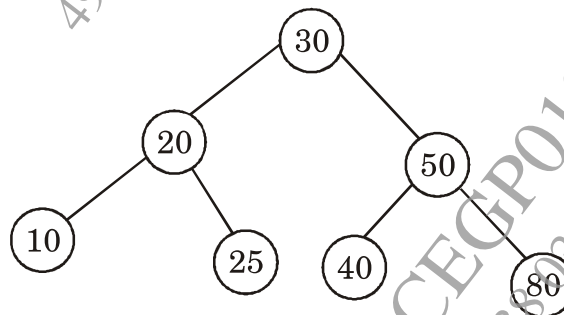


Fig. 1

7. (a) What is minimum spanning tree of a graph. Find out the minimum spanning tree of the following graph (Fig. 2) using : [7]
- (i) Prim's Algorithm
- (ii) Kruskal's Algorithm.

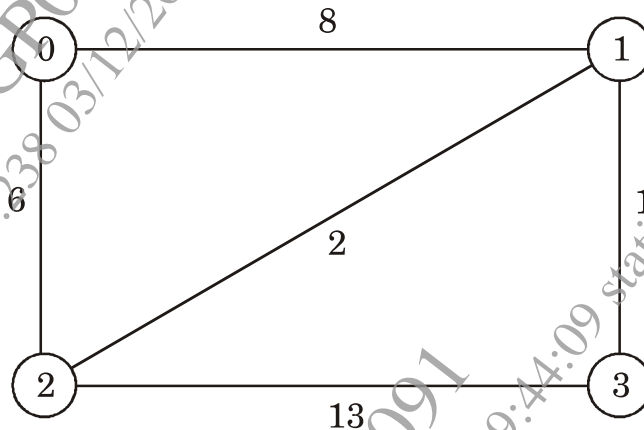


Fig. 2

- (b) Explain Dijkstra's Algorithm with suitable example. [6]
- Or
8. (a) Define the term graph. Give adjacency matrix and adjacency list representation of graph shown in Fig. 3. [7]

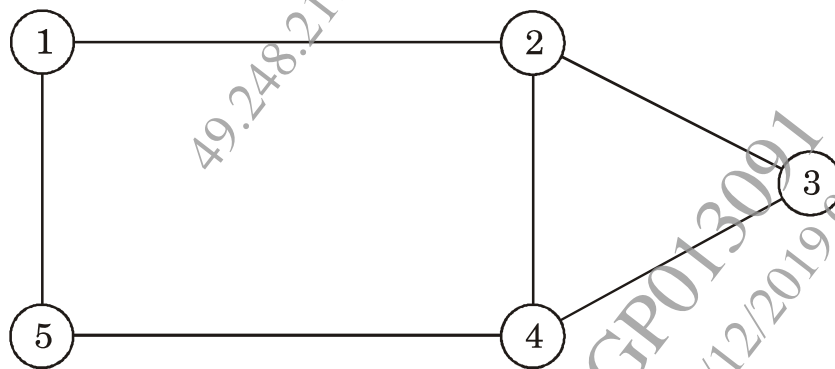


Fig. 3

- (b) Explain with suitable example BFS and DSF traversal of graph. [6]