



204184

Seat No.	
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**S.E. Electronics (E & TC) (Semester – I) Examination, 2014
DATA STRUCTURES AND ALGORITHMS
(2012 Course)**

Time : 2 Hours

Max. Marks : 50

- Instructions :** 1) Answer **Q. 1** or **Q. 2** and **Q. 3** or **Q. 4** and **Q. 5** or **Q. 6** and **Q. 7** or **Q. 8**.
2) Assume suitable data if **necessary**.
3) Write output for programs **where ever** is necessary.
4) Draw neat diagrams/sketches **where ever** is necessary.
5) Do not attach supplement unless it is essential.
6) Figures to the **right** indicate **full** marks.

1. a) Sort the following numbers using Bubble Sort. Show all steps and discuss the time complexity. 6
20 5 18 7 21 6
b) Explain the term Data Structure and its operations. 6

OR

2. a) What is a String ? Explain the usage of string functions strcmp and strlen. 6
b) Explain in detail : Index Sequential Search and Local and Global Variables. 6
3. a) Write an algorithm with appropriate illustrations to perform the following operations on Singly Linked list (SLL). Delete a node (Start, end, intermediate). 6
b) What is the disadvantage of Linear Queue ? Suggest suitable method to overcome. 6

OR

4. a) Complete following missing expression in the table. 6

Infix	Prefix	Postfix
$(A+B*C)/(D+E/F)$	---	---
---	$+A*BC$	---
---	---	$ABC+*EF/-$

- b) What is a Doubly Linked List ? Compare it with Singly Linked List in terms of pros and cons. 6

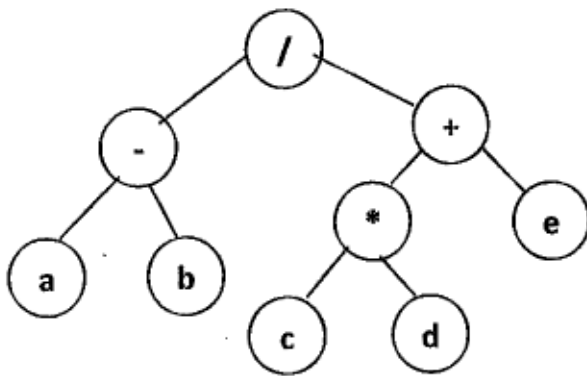
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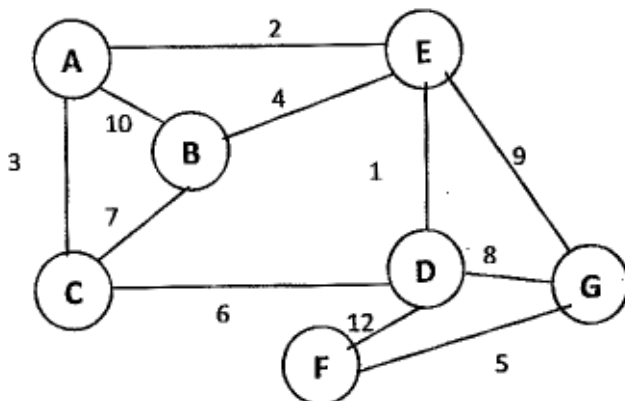
- 5. a) Using the following data, draw a Binary Search Tree. Show all steps. 4
10 60 40 28 14 50 5
- b) What is a AVL Tree ? Explain with a suitable example RR and LL rotation. 4
- c) Define the following terms with respect to Trees : 5
 - i) Root
 - ii) Subtree
 - iii) Level of node
 - iv) Depth of Tree
 - v) Siblings

OR

- 6. a) Define Binary Tree. What are its types ? Explain with suitable figures. 3
- b) Write a C function to search element in binary search tree. 4
- c) Write inorder, preorder and postorder traversals for the following tree. 6



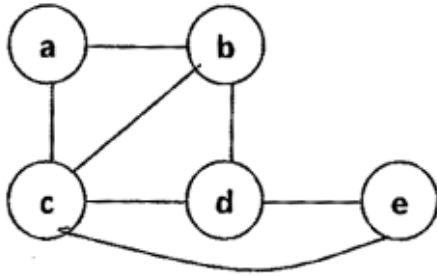
- 7. a) Write an algorithm for BFS Traversal of Graph. 4
- b) Write an algorithm to find in-degree and out-degree of a vertex with a suitable example. 4
- c) Write Kruskals algorithm for the given graph hence find minimum spanning tree. 5



OR



- 8. a) What is a minimum spanning tree ? Explain with suitable example Prims algorithm. 4
- b) Represent the following graph using adjacency matrix and adjacency list. 5



- c) Explain the term topological sorting with a suitable example. 4

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