

MCA (Revised) / BCA (Revised)

Term-End Examination

June, 2016

07446

MCS-021 : DATA AND FILE STRUCTURES

Time : 3 hours

Maximum Marks : 100

(Weightage 75%)

Note : Question number 1 is compulsory. Attempt any three questions from the rest. All algorithms should be written nearer to 'C' language.

1. (a) Define "Time Complexity" and "Space Complexity". What are the differences between them ? 10
- (b) Write the algorithms for inserting and deleting elements in a singly linked list. 10
- (c) Write an algorithm to implement a stack, using arrays. 10
- (d) Explain various operations performed in a B-tree. 10
2. (a) What is a Sparse Matrix ? What are the advantages and disadvantages of Sparse Matrix representation ? 10

- (b) What is a circular queue ? Explain how it can be implemented using arrays. 10
3. (a) Draw a binary search tree (BST) for the input 8, 14, 23, 18, 38, 45, 56, 82, 70. Trace the algorithm to insert the node 20 into the BST. 10
- (b) Define “AVL Tree”. Write any two applications of AVL Trees. 10
4. (a) What is DFS ? What is BFS ? Explain the differences between them. 10
- (b) Explain Dijkstra’s algorithm with an example. 10
5. (a) Illustrate inserting an element into a heap with the following numbers : 10
2, 3, 81, 64, 4, 25, 36, 16, 9, 49
- (b) Compare and contrast the Splay trees with AA trees. 10
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