

**B.Tech. IN COMPUTER SCIENCE &
ENGINEERING (BTC SVI)**

Term-End Examination

June, 2011

BICS-007 : DATA STRUCTURES

Time : 3 hours

Maximum Marks : 70

Note : Attempt any five questions. All questions carry equal marks.

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1. (a) Calculate the address of Data [4,3] in a two dimensional array Data [1-5,1-4] stored in 7
(i) row major form
(ii) column major form
Assume the base address to be 1000 and that each element requires 4 bytes of storage.
- (b) What is space matrix ? Describe with 7
suitable example.
2. (a) Write 'C' function to insert an element in 7
circular linked list.
- (b) Convert the following arithmetic expression 7
into postfix and show stack status after every step in tabular form
$$A + (B * C - (D / E - F) * G) * H$$

3. (a) A binary tree has nine nodes. The inorder and preorder traversal yield the following sequence of nodes : 7
 Inorder : E A C K F H D B G
 Preorder : F A E K C D H G B
 Draw the binary tree.
- (b) Write an algorithm for breadth first search traversal of a graph. 7
4. (a) What is hashing ? Explain each type of hash function with suitable example. 7
- (b) What are the different searching techniques ? Explain one of them with suitable example. 7
5. (a) Explain Quick sort with suitable example. 7
 (b) Sort the following elements using heap sort. 7
 10, 5, 8, 6, 11, 2, 19, 7
6. (a) Write the algorithms to insert and delete an element from a circular queue. 7
 (b) Write a 'C' function to insert an element in the beginning of the doubly linked list. 7
7. Write short notes on *any two* of the following : 2x7=14
 (a) Circular queue.
 (b) Stack overflow and underflow
 (c) Garbage collection.
 (d) Planner graph.
 (e) Hamiltian path.
 (f) Ordered list.
 (g) Algorithm.