

Hall Ticket Number:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Code No.: 144

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
MCA I Year II - Semester (Main/Backlog) Examinations, June/July - 2016

Data Structures

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE questions from Part-B

Part-A (10 X 2=20 Marks)

1. Why can't we represent polynomials using arrays explain?
2. Brief an application of Double linked list.
3. Stacks are known as _____ Lists and Queues are known as _____ Lists
4. Explain Queue supporting methods enqueue () and dequeue ().
5. Differentiate between Tree and a Binary Tree.
6. Find the number of distinct binary trees with 5 nodes.
7. What is the purpose of internal sorting?
8. When do we get an overflow in hashing and how is it handled?
9. In a *directed graph* each edge is represented by a directed pair (v1, v2), then v1 is _____ and v2 is _____ of the edge.
10. The matrix A^* with the property $A^*(i, j) = 1$, if there is a path of length 0 from i to j and 0 otherwise is the _____ matrix of G .

Part-B (5 X 10=50 Marks)

11. a) Explain "Available Space Lists" with an example. [5]
b) Distinguish the merits and demerits of arrays and linked lists. [5]
12. a) Write the postfix form of the following expression: A+B-C+D [4]
b) Differentiate between stacks and queues. [6]
13. a) Explain the purpose of RED-BLACK trees. [5]
b) Prove the following statement: [5]
If a complete binary tree with n nodes (i.e., depth = $\lceil \log_2 n \rceil + 1$) is represented sequentially then for any node with index i , then we have: PARENT (i) is at $\lceil i/2 \rceil$ if $i > 1$.
When $i = 1$, i is the root and has no parent.
14. a) Differentiate between Quick Sort and Merge Sort. [6]
b) Explain collision resolution techniques. [4]
15. a) Explain Elementary Graph operations. [4]
b) Compare BFS and DFS in graphs. [6]
16. a) Write a C++ Program to reverse the elements of a Single linked list. [5]
b) Write an algorithm to multiply two matrices. [5]
17. Answer any **two** of the following:
a) Construct a Binary tree, given the following traversals. [5]
Preorder Traversal : A B D E C F Inorder Traversal : D B E A F C
b) Sort the below data using insertion sort. [5]
52, 35, 61, 27, 38, 16, 7, 3, 1, 71.
c) Explain the applications of MST. [5]
