

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086
(For candidates admitted during the academic year 2008-09 & thereafter)

SUBJECT CODE: CS/MC/AD24
B. C. A. DEGREE EXAMINATION, APRIL 2011
SECOND SEMESTER

REG. NO. _____

COURSE : MAJOR CORE
PAPER : ALGORITHMS AND DATA STRUCTURES
TIME : 30 MINUTES **MAX. MARKS: 20**

TO BE ANSWERD ON THE QUESTION PAPER ITSELF.

SECTION-A **(20 x 1 = 20)**

Answer all questions:

I. Choose the correct answer:

1. _____ data structure shows the hierarchical relationship between various elements.
(a) stack (b) Queues (c) Tree (d) Graph
2. Complexity of binary search algorithm is given by _____.
(a) $c(n)=\log_2n$ (b) $c(n)=2\log n$ (c) $c(n)=n/2\log$ (d) None
3. _____ efficiency is the minimum number of steps that an algorithm can take for any collection of data values.
(a) Best case (b) Average case (c) Worst case (d) General case
4. _____ is a list of finite number n of homogeneous data elements.
(a) Linear array (b) non linear array (c) Matrix (d) all
5. Bubble sort algorithm requires _____ passes.
(a) n (b) $n-1/2$ (c) $2n-1$ (d) $n-1$.
6. _____ is a special list which consist of unused memory cells.
(a) free storage list (b) free pool (c) List of available space (d) all
7. In _____ the last node points back to the header node.
(a) Grounded header list (b) Circular header list
(c) Circular stack (d) None of the above.
8. The condition (Front=1 and Rear=N) checks for _____.
(a) Under flow (b) Empty stack (c) Over flow (d) Empty Queue
9. Pre order traversal follows _____.
(a) [Left Right Root] (b) [Root Right Left]
(c) [Root Left Right] (d) [Left Root Right]
10. Quick sort is an application of _____.
(a) Tree (b) Queue (c) Stack (d) List

II. Fill up the blanks.

11. The structure implementing selection logic is called_____.
12. The line drawn from a node N to T to a successor is called _____.
13. Accessing each element once in a data collection A is called_____.
14. In a tree, terminal node is called_____.
15. In _____ element can be removed or added at either end but not in middle.

III. Write true or false:

16. Algorithm is a step by step list of well defined instructions to solve problems.
17. An element with higher priority is processed before any element with lower priority.
18. Trees are said to be copies if they are similar.
19. Stack is a LIFO list.
20. Complexity of insertion sort algorithm at its average case is $O(n^2)$.

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SECTION-B

(8 x 5 = 40)

Answer any eight questions:

1. Explain the concept of Fibonacci sequence with an algorithm.
2. Brief a note on space and time complexity of an algorithm analysis.
3. Sort the following numbers using selection sort and write the algorithm.
78,43,91,12,54,89,65,27
4. Define binary search and find the Item=41 from the following array.
14,29,34,41,84,94,105
5. Explain the searching operation in a linked list with algorithm.
6. Write a note on Insertion and Deletion operation on two way list.
7. Explain how stacks are represented using arrays.
8. Brief a note on Dequeue.
9. Write an algorithm for searching in Binary Search Tree.
10. Explain the binary tree representation in memory.

SECTION-C

(10 x 4 = 40)

Answer any four questions:

11. Discuss on development of an algorithm.
12. Write a note on Quick sort. Give example and algorithm.
13. Write the different deletion algorithms for linked list. Explain with example.
14. Explain Queue and its various operations with an algorithm and example.
15. How linear search can be carried out and show it with an algorithm and write the complexity of linear search.
16. Discuss on tree traversal.
