

**STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086**  
**(For candidates admitted during the academic year 2011-12 & thereafter)**

**SUBJECT CODE: 11CS/MC/AD24**

**B. C. A. DEGREE EXAMINATION, APRIL 2015**  
**SECOND SEMESTER**

**REG.NO: \_\_\_\_\_**

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

**TO BE ANSWERED ON THE QUESTION PAPER ITSELF**

**SECTION-A**

**(20 x 1 = 20)**

**Answer all questions:**

**Choose the correct answer:**

1. Two main measures for the efficiency of an algorithm are \_\_\_\_\_.  
a. Processor and memory                      b. Complexity and capacity  
c. Time and space                                d. Data and space
2. Which of the following data structure is not a linear data structure?  
a. Arrays                      b. Linked lists                      c. Both a and b                      d. None of these
3. Which of the following sorting algorithm is of divide-and-conquer type?  
a. Bubble sort                      b. Insertion sort                      c. Quick sort                      d. All of these
4. A nonlinear collection of data given by means of pointer is called \_\_\_\_\_.  
a. queue                      b. linked list                      c. stack                      d. graph
5. The term push and pop are related to \_\_\_\_\_.  
a. array                      b. queue                      c. stack                      d. linked list
6. Which of the following term does not relate to stacks?  
a. FILO lists                      b. LIFO list                      c. Files                      d. Push-down lists
7. Finding the location of the element with a given value is \_\_\_\_\_.  
a. Traversal                      b. Search                      c. Sort                      d. None of above
8. The operation of processing each element in the list is known as \_\_\_\_\_.  
a. Sorting                      b. Merging                      c. Inserting                      d. Traversal
9. If every node  $u$  in  $G$  is adjacent to every other node  $v$  in  $G$ , a graph is said to be \_\_\_\_\_.  
a. strongly connected                      b. complete                      c. finite                      d. isolated
10. A connected graph  $T$  without any cycles is \_\_\_\_\_.  
a. a tree graph                      b. acyclic                      c. a tree                      d. All of these

**Fill in the blanks:**

11. The logical or mathematical model of a particular organization of data is called a \_\_\_\_\_.
12. \_\_\_\_\_ is a self contained step by step set operation to be performed to solve a problem.
13. \_\_\_\_\_ data structure is a non linear type.
14. Generally collection of node is called \_\_\_\_\_.
15. \_\_\_\_\_ data structure is the linear data structure.
16. The data structure which is one ended is \_\_\_\_\_.
17. A path from the root to any other node is called \_\_\_\_\_.
18. A full binary tree with  $2n+1$  nodes contain \_\_\_\_\_ leaf nodes.
19. In Graph the data structure is \_\_\_\_\_.
20. \_\_\_\_\_ graph traversal algorithm uses a queue to keep track of vertices which need to be processed.

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**SECTION-B** **(5 x 2 = 10)**

**Answer ALL the questions:**

1. Define: Algorithm.
2. What is linked list?
3. What is the use of array?
4. What is binary tree?
5. Define the term: Graph.

**SECTION-C** **(8 x 5 = 40)**

**Answer any EIGHT questions:**

6. Explain about factorial computation.
7. Write short notes on Linear search.
8. Write the algorithm to sort the elements using merge sort.
9. Write short notes on circular list.
10. Explain about different operations on queue.
11. Write the steps to convert infix expression to prefix.
12. Explain about representation of binary trees with a neat diagram.
13. Write short notes on search operation in binary tree.
14. Explain about different operations in graph.
15. Write a short note on graph traversals.

**SECTION-D**

**Answer any THREE questions:** **(3 x 10 = 30)**

16. Explain in detail about various steps involved in algorithm development.
17. Write and explain the algorithm for bubble sort with the following data  
56, 3, 42, 1, 11, 71.
18. Explain in detail about stack with a neat diagram.
19. Explain in detail about different operations in binary trees.
20. Explain about representation of graphs in detail.

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