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Paper Code : MCAN-303 Design and Analysis of Algorithm

UPID : 003881

Time Allotted : 3 Hours *Full Marks :70*

The Figures in the margin indicate full marks.
Candidate are required to give their answers in their own words as far as practicable

Group-A (Very Short Answer Type Question)

1. Answer *any ten* of the following : [1 x 10 = 10]

(I) Identify the sorting technique which compares adjacent elements In a list and switches whenever necessary.

(II) The time complexity to find the longest common subsequence of two strings of length M and N is _____.

(III) The Bellmann Ford Algorithm returns _____ value.

(IV) When a pop() operation is called on an empty queue, what is the condition called?

(V) Which algorithm is used to find the shortest path from a source node to all other nodes in a weighted graph?

(VI) What is the time complexity in decreasing the node value in a binomial heap?

(VII) A ___ is a compact, informal and environment-independent description of a computer programming algorithm.

(VIII) To main measures of the efficiency of an algorithm are _____.

(IX) The worst-case time complexity of Quicksort is _____.

(X) Are Sentence Ordering , Course Scheduling applications of Topological Sort of a graph?

(XI) The time complexity for travel Singh all nodes in a binary search tree with n nodes and printing them in order is _____.

(XII) ___ of an algorithm is the amount of time required for it to execute.

Group-B (Short Answer Type Question)

Answer *any three* of the following : [5 x 3 = 15]

2. What is Minimum Spanning Trees? [5]
3. List the advantage of Huffman's encoding. [5]
4. What is the order of growth? [5]
5. What are the basic asymptotic efficiency classes? [5]
6. List the factors which affects the running time of the algorithm. [5]

Group-C (Long Answer Type Question)

Answer *any three* of the following : [15 x 3 = 45]

7. A. Write the Brute force algorithm to string matching. [5+5+5]
Algorithm NAÏVE(Text, Pattern)
B. What is the time and space complexity of Merge Sort?
C. State the Convex Hull Problem

8. A. Write the algorithm for Iterative binarysearch. [5+5+5]
B. Define internal path length and external pathlength.
C. Write an algorithm for brute force closest-pair problem.

9. Write algorithm to find closest pair of points using divide and conquer and explain it with example. Derive the worst case and average case time complexity. [9+6]

10. What is Convex hull problem? Explain the brute force approach to solve convex-hull with an example. Derive time complexity. [5+5+5]

11. A. What is binarysearch? Give an example. [8+7]
B. What is Knapsack problem?

*** END OF PAPER ***