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SE-6761

B. E. III (Sem. V) Examination

April / May – 2011

Algorithm Analysis & Design

(Comp. Engg.)

Time : **3** Hours] [Total Marks : **100**

Instruction :

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. 3 (Sem. 5)**

Name of the Subject :

☛ **Algorithm Analysis & Design**

☛ Subject Code No. : **6 7 6 1** ☛ Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

1 (a) Do as directed.

(i) Define Algorithm. What criteria must satisfied by all Algorithms ? **2**

(ii) Define space complexity. **2**

(iii) Arrange the following in ascending order. **3**
O(nlogn), O(n^2logn), O(logn), O(n), O(1), O(2").

(iv) The complexity of successful binary search is in best case, average case and worst case are _____, _____ and _____. **3**

(b) Explain all Asymptotic notations with graphical representation. **8**

2 (a) Write the Algorithm for merge sort and draw tree of of its calls for following example. **10**
179, 285, 310, 351, 652, 254, 423, 861, 450, 520.

(b) Explain greedy method for knapsack problem. Solve for n=3, m=20, (p1,p2,p3)=(25,24,15) and (w1,w2,w3)=(18, 15, 10). **7**

OR

2 (b) Discuss the problem of job sequencing with deadline. Solve for n=4, (p1,p2,p3,p4)=(100,10,15,27) and (d1,d2,d3,d4)=(2,1,2,1). **7**

3 Attempt any **three**. **15**

(a) Explain Posteriori and priori analysis of algorithm.

(b) Write recursive algorithm for find maximum and minimum.

(c) Explain Dijkstra's algorithm.

(d) Control abstraction of Divide and control strategy.

(e) Discuss Huffman coding problem.

4 (a) Describe the following terms. **10**

(i) Live node

(ii) Static Tree

(iii) Breadth First Search

(iv) NP Hard Problem

(v) Bounding Function.

(b) Answer the following **10**

(i) Show step by step graphical solution & tree of the 4 queen's problem and 2 equivalent solutions of 4 queen problem.

(ii) Write BFS algo with example. Explain how it is related with FIFO. Is It advantageous to use FIFO over LIFO in 15 puzzle prob. ?

5 (a) Discuss traveling salesman problem with respect to dynamic programming. **8**

OR

5 (a) Discuss sum of subset problem with algorithm. **8**

(b) Discuss Knapsack problem with branch & bound strategy. **7**

6 (a) State all pairs shortest path problem and formulate its algorithm also. Compare and constrast single source shortest paths and all pairs shortest paths. **8**

OR

6 (a) Discuss Optimal Binary Search tree. **8**

(b) Explain 0/1 Knapsack problem using dynamic programming. **7**