



RM-6543

B. E. - II (Sem. IV) (I.T.) Examination

May / June - 2010

Algorithms Analysis & Design

Time : 3 Hours]

[Total Marks : 100

Instructions :

(1)

नीचे दशांशवेल निशानीवाणी विगतो उत्तरवडी पर अवश्य लखवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="B. E. - 2 (Sem. 4) (I.T.)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="Algorithms Analysis & Design"/>	<input type="text"/>
Subject Code No. : <input type="text" value="6"/> <input type="text" value="5"/> <input type="text" value="4"/> <input type="text" value="3"/>	Section No. (1, 2,.....): <input type="text" value="1&2"/>
Student's Signature	

- (2) Answers to both the sections must be written in **separate** answer books.
- (3) Figures to the extreme **right** indicate maximum marks.
- (4) Assume suitable data, if **necessary**.
- (5) Support your answer with neat and clean diagram wherever **necessary**.

SECTION - I

- 1 (a) Fill in the blanks (i to iv), check the validity for v : **10**
- (i) The total number of record moves for merging 5 files of length 20, 30, 10, 5, 30 is _____.
 - (ii) The worst case complexity of Binary search solved by divide and conquer is _____ for successful search and _____ for unsuccessful search.
 - (iii) If $p_1 \geq p_2 \geq \dots \geq P_n$, then Greedy Knapsack generates an optimal solution to the given instance of the knapsack problem. State True or False.
 - (iv) In optimal Storage of tapes, If $l_1 \leq l_2 \leq l_3 \leq \dots \leq l_n$, then the ordering $i_j = j, 1 \leq j \leq n$ minimizes.

$$\sum_{k=1}^n \sum_{j=1}^k l_j$$

Overall all possible permutations of the i_j . State True or False.

- (v) Check whether the equalities are correct or not.
- (a) $9n^2 + 7n = \Omega(n^2)$
- (b) $n^2 + 4n = \Omega(n^3)$
- (b) Answer the following : 10
- (i) Solve the following recurrences using Master method :
- (a) $T(n) = T(2n/3) + 1$
- (b) $T(n) = 3T(n/4) + n \lg n$
- (ii) Write a short note on asymptotic notations.
- 2 (a) Explain Merge Sort and write algorithm for Merge sort with example. 8

OR

- (a) Explain and write Kruskal's Algorithm with example. 8
- (b) Write and explain the algorithm for finding the maximum and minimum number from given array. 7
- 3 (a) What is Greedy Method? Explain various characteristics of Greedy Method. 8

OR

- (a) Explain Dijkstra's algorithm to find single source shortest path of a weighted directed graph $G = (V, E)$. 8
- (b) Find an optimal placement of 13 programmes on Tapes T_0 and T_1 where programmes are of length. 7
11,6,9,29,4,3,8,14,32,21,13,4,7

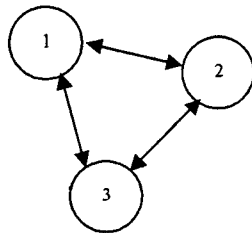
SECTION - II

- 4 (a) Define the following with example. 10
- (i) E Node
- (ii) Dead Node
- (iii) Chromatic Number
- (iv) State space tree
- (v) BFS and DFS.
- (b) Write and explain Sum of Subsets problem with algorithm. 8

- 5 (a) Explain 0/1 Knapsack problem using dynamic programming. 8
- (b) State the 15-puzzle problem and explain the solutions that can be used to solve the problem. 8

OR

- (b) Explain LC search with example and write control abstraction for the same. 8
- 6 Attempt any **four** of the following : 16
- (i) Various Algorithm Design Techniques
- (ii) Application of Binary tree in Huffman codes
- (iii) Explain Implicit and Explicit Constraints associated with 8-Queen's problem.
- (iv) Discuss Optimal Binary Search Trees.
- (v) Find Optimal tour for the following graph. The edge lengths are given by matrix.



	1	2	3
1	0	3	3
2	4	0	2
3	8	5	0
