UNIVERSITY OF PUNE

[4364]-761

B.E. (Computer Engineering)

(Semester - I) Examination - 2013

DESIGN ANALYSIS OF

ALGORITHMS

(2008 Pattern)

Total No. of Questions: 12 [Total No. of Printed Pages :4]

[Time: 3 Hours] [Max. Marks: 100]

Instructions:

- Answer any three questions from section I and questions from section 2.
- Answers to the two sections should be written in separate answer-books.
- (3) Black figures to the right indicate full marks.
- (4) Neat diagrams must be drawn wherever necessary.
- (5) Assume suitable data, if necessary.

SECTION -1

- Q. 1. a) Prove if $f(n) = a_m n^m + \dots + a_1 + a_0$ Then $f(n)=O(n^m)$ (8)
 - b) Write control abstraction for divide and conquer strategy. Give the reason why the quick sort is faster than merge sort. (6)
 - c) Explain the Greedy Kruskal's minimum spanning tree. (4)

OR

- Q. 2. a) Prove by contradiction that "there are infinitely many prime numbers". (6)
 - b)Write and explain Dijkstra's algorithm for a directed graph. (6)
 - c) Write an algorithm for merge sort. State its time complexity. (6)
- Q. 3. a) Solve the instance of 0/1 knapsack problem using dynamic

Programming:
$$n = 4, m = 25$$

 $(P_1, P_2, P_3 P_4) = (10,12,14,16)$
 $(W_1, W_2, W_3, W_4) = (9,8,12,14,)$
(8)

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