

Code: IT4T3

II B.Tech - II Semester – Regular Examinations - JUNE 2014**DESIGN ANALYSIS OF ALGORITHMS
(INFORMATION TECHNOLOGY)**

Duration: 3 hours

Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. a) Find the time complexity for following problems. 8 M

i) $1^3 + 2^3 + 3^3 + \dots + n^3$

ii) Recursive-Power(x, n)

if n = 1

return x

if n is even

y = Recursive-Power(x, n/2)

return y*y

else

y = Recursive-Power(x, (n-1)/2)

return y*y*x

iii) $T(n)=7T(n/2)+O(n^2)$

b) Explain different Asymptotic notations. 6 M

2. a) Explain Travelling salesman problem with Exhaustive search method. 7 M

- b) What is the difference between Bubble sort and Selection sort? And write the algorithm for selection sort. 7 M
3. a) Consider and find the pivot element/s from following elements which are generated after first iteration in quick sort method.
23, 56, 37, 62, 34, 92, 98 6 M
- b) Explain divide and conquer method with Merge sort example. 8 M
4. a) Explain topological sort with an example and write the algorithm for topological sort. 7 M
- b) Explain the Horner's rule with an example for evaluating the polynomial equation. 7 M
5. a) Where we use Huffman coding technique? And find the average code length of Huffman tree which is constructed using following constraints: 7 M
 $P(a_1)=0.2, P(a_2)=0.4, P(a_3)=0.2, P(a_4)=0.1, P(a_5)=0.1$
- b) What is a spanning Tree? Find minimum spanning tree using Prim's algorithm. 7 M
6. Write Warshall's and Floyd's Algorithm and explain it. 14 M

7. a) Discuss and draw the relations among P class, NP Class, NP Hard and NP Complete. 7 M
- b) Draw a decision tree for three element Bubble sort. 7 M
8. a) Explain Branch and bound assignment problem with an example. 7 M
- b) State and Explain 4 queen problem using branch and bound method. 7 M