

Roll Neww.FirstRanker.com

**B.TECH.** 

#### THEORY EXAMINATION (SEM–VI) 2016-17 APPROXIMATION AND RANDOMIZED ALGORITHMS

# APPROXIMATION AND RAND

### Time : 3 Hours

*Note* : *Be precise in your answer. In case of numerical problem assume data wherever not provided.* 

#### **SECTION-A**

## **1** Explain the following :

- a) Define principle of optimality.
- **b**) Define linear programming
- c) Solve the recurrence relation, where T(1)=1 and T(n) for  $n \ge 2$  satisfies T(n)=3T(n/2)+n
- **d**) What is order of growth?
- e) Define  $\Theta$ -notation.
- f) Give two examples of randomized algorithms.
- g) What is amortized efficiency?
- **h**) State two applications of Approximation algorithms.
- i) What is derandomized algorithms?
- **j**) What is bin packing?

### **SECTION-B**

#### 2 Attempt any five of the following :

- a) Explain in detail about simplex method
- **b**) Illustrate the steps involved in analyzing algorithm using an example.
- c) Explain a sorting algorithm that use divide and conquer method.
- d) Explain P, NP and NP complete problems.
- e) Define Linear Programming
- f) Explain permutation routing in a hypercube.
- g) Discuss Euclidean TSP.
- h) Discuss k-median on a cycle with suitable example.

### **SECTION-C**

## Attempt any two of the following :

- **3.** Suggest an approximation algorithm for traveling salesperson problems using Minimum spanning tree algorithm. Assume that the cost function satisfies the triangle inequality.
- 4. Explain in detail about approximation algorithm for the Knapsack problem.
- 5. Discuss some examples of randomized algorithms using basic inequalities and random variables.

Max. Marks : 100

(10×2=20)

www.FirstRanker.com

(10×5=50)

 $(15 \times 2 = 30)$