Reg. No. | | | | | | | | | | | |

Question Paper Code : 27308

5 Year M.Sc. DEGREE EXAMINATION, MAY/JUNE 2016

Fifth Semester

Software Engineering

ESE053 – DESIGN AND ANALYSIS

(Regulations 2010)

Time : Three Hours **Maximum : 100 Marks**

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. State the differences between dynamic programming and divide-and-conquer techniques.
2. How the algorithm's time efficiency is measured ?
3. What is the principle of optimality with an example ?
4. Define multistage problem with an example.
5. What is Hamiltonian cycle ?
6. What is a Biconnected component in Graph ?
7. Differentiate backtracking and branch bound techniques.
8. Give the upper bound and lower bound of matrix multiplication algorithm.
9. Define halting problem.
10. What are the two types to show a decision problem is NP-Complete ?

PART – B (5 × 16 = 80 Marks)

11. (a) (i) Briefly discuss the sequence of steps typically required in designing and analyzing an Algorithm. **(8)**

(ii) Explain briefly about Big Oh Notation, Omega Notation and Theta Notations. Give examples. **(8)**

OR

(b) Distinguish between merge sort and quick sort and arrange the numbers in increasing order using merge sort (18,29,68,32,43,37,87,24,47,50) **(16)**

12. (a) Briefly explain the procedure used for Strassen's Matrix multiplication. **(16)**

OR

(b) Write down and explain the algorithm to solve all pairs shortest paths problem. **(16)**

13. (a) (i) Explain binary tree and its properties. **(8)**

(ii) Write short notes on Connected Components and Spanning Trees. **(8)**

OR

(b) (i) Define a spanning tree T and a Minimum Spanning Tree (MST). **(8)**

(ii) How will you find MST using Prim's algorithm and Kruskal's algorithm ? Illustrate with an example. **(8)**

14. (a) Solve the following instance of the knapsack problem by the branch-and-bound algorithm, with W = 16.

Item	Weight	Value
1	10	100
2	7	63
3	8	56
4	4	12

(16)

OR

(b) State and explain the n-Queen problem using backtracking. **(16)**

15. (a) Brief travelling salesman problem using NP hard approach. **(16)**

OR

(b) How the Approximation Algorithm will differ from NP with an example ? **(16)**