

Code No: 5405AA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**M. Tech I Semester Examinations, December – 2018/January - 2019****ADVANCED ALGORITHMS****(Computer Science)****Time: 3hrs****Max.Marks:75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**5 × 5 Marks = 25**

- 1.a) What is divide and conquer? [5]
- b) Explain the operation of stack with an example. [5]
- c) What are the differences between the greedy method and dynamic programming? [5]
- d) Explain the maximum flow in the network with an example. [5]
- e) What is the difference between NP hard and NP Complete? [5]

PART - B**5 × 10 Marks = 50**

- 2.a) Explain the Strassen's Matrix Multiplication Algorithm with example? Analyze the time Complexity?
- b) How the Probabilistic analysis and random analysis useful in design process of algorithms? [5+5]

OR

3. Solve the following recurrence relations by using Master's theorem.
 - a) $T(n) = 4T(n/2) + n/2$
 - b) $T(n) = 2T(n/2) + n \log n$ the recurrence-tree method for solving recurrence. [5+5]
- 4.a) What is the Importance of hash table? Explain the advantages and disadvantages of hash table with possible justifications?
- b) What are the properties of Red-Black tree? [5+5]

OR

- 5.a) Explain the advantages and disadvantages of red black trees with possible justifications?
- b) Write insertion algorithm of Binary search tree. [5+5]

6. Explain about Amortized analysis. [10]

OR

- 7.a) What are the advantages and disadvantages of graph algorithms?
- b) What is optimal solution? Explain in detail matrix chain multiplication? [5+5]

8. Explain in detail the prims algorithm with example? Analyze the time complexity?[10]

OR

9. Explain in detail single source shortest path? List the advantages and disadvantages of it? [10]

- 10.a) Briefly explain deterministic and non deterministic algorithms with example
- b) Why the need of approximate algorithm? Explain it with example? [5+5]

OR

- 11.a) Write an approximation algorithm of sum of subsets problem.
- b) Explain about clique decision problem. [5+5]

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