

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

THIRD SEMESTER M.C.A DEGREE EXAMINATION (Regular), FEBRUARY 2022**(2020 SCHEME)****Course Code: 20MCAT203****Course Name: Design & Analysis of Algorithms****Max. Marks: 60****Duration: 3 Hours****PART A***(Answer all questions. Each question carries 3 marks)*

1. Define Big Theta.
2. Explain Strassen's method for matrix multiplication.
3. Write the control abstraction of iterative backtracking method.
4. Differentiate Divide & Conquer and Dynamic Programming.
5. State the differences between NP Hard and NP Complete.
6. Describe Kruskal's algorithm for finding the minimum cost spanning tree.
7. Define the terms Live Node and E-node with respect to solution space.
8. Explain Network Flow with an example.
9. Compare and contrast approximation algorithms and randomized algorithms.
10. Briefly describe approximation ratio.

PART B*(Answer one full question from each module, each question carries 6 marks)***MODULE I**

11. Write an algorithm for Quick Sort and analyze it with an example. (6)

OR

12. With suitable examples, explain various methods of solving recurrence equations. (6)

MODULE II

13. Explain Travelling Salesman Problem and specify its time complexity. (6)

OR

14. Describe All pairs shortest path problem using Dynamic Programming. (6)

MODULE III

15. Write an algorithm for N-Queen's problem. Give time and space complexity for 8-Queen's problem. (6)

OR

16. State sum of subsets problem. Find all sum of subsets for $n=4$, $(w_1, w_2, w_3, w_4) = (11, 13, 24, 7)$ and $M=31$. Draw the portion of the state space tree using fixed-tuple sized approach. (6)

MODULE IV

17. What is clique problem? Explain the clique problem as an optimization problem and as a decision problem. (6)

OR

18. Explain the different types of complexity classes. Give examples of NP Hard and NP Complete problems. (6)

MODULE V

19. Compare and contrast linear programming with approximation algorithms. (6)

OR

20. Explain vertex cover problem using the method of approximation algorithm. (6)
