

**E 7592**

(Pages : 2)

Reg. No.....

Name.....

**B.C.A. DEGREE (C.B.C.S.S.) EXAMINATION, OCTOBER 2017**

**Third Semester**

**Core Course—DESIGN AND ANALYSIS OF ALGORITHMS**

(2013 Admission onwards)

Time : Three Hours

Maximum Marks : 80

**Part A. (Short Answer Questions)**

*Answer all questions.*

*Each question carries 1 mark.*

1. What is Big 'Oh' notation ?
2. Write the difference between best case and worst case complexities.
3. What is the time complexity of Merge sort and Quick sort ?
4. Explain Minimum cost spanning tree.
5. What is a recursive call ?
6. What are the applications of binary tree ?
7. Explain backtracking ?
8. Define Graph ?
9. Quick sort following. 10 9 3 9 1
10. How do you analyze algorithms ?

(10 × 1 = 10)

**Part B (Brief Answer Questions)**

*Answer any eight questions.*

*Each question carries 2 marks.*

11. Sort the following sequence of keys using merge sort. 66, 77, 11, 88, 99, 22, 33, 44, 55.
12. Differentiate between subset paradigm and ordering paradigm in greedy method.
13. Write the control abstraction for divide and conquer method.
14. What is an NP hard problem ?
15. What are the characteristics of the optimization problem in the context of Greedy algorithm ?
16. Explain optimal binary search tree.

**Turn over**

17. Write an algorithm to find the shortest-path of all pairs of edges in a graph.
18. Define divide and conquer strategy.
19. State Planar Graph colouring problem.
20. What is bi-connected component?
21. Write algorithm for insertion sort.
22. Write a recursive algorithm for Fibonacci series.

(8 × 2 = 16)

### Part C (Descriptive/Short Essay Type Questions)

*Answer any six questions.  
Each question carries 4 marks.*

23. Explain the characteristics of a problem that can be solved efficiently using Dynamic programming technique.
24. Describe the concept of binary search technique ? Is it efficient than sequential search ?
25. What is quick sort? Sort the following array using quick sort method.  
24    56    47    35    10    90    82    31
26. What are the differences between Prim's algorithm and Kruskal's algorithm for finding the minimum-spanning tree of a graph ?
27. Explain Hamiltonian circuit problem.
28. Write an algorithm using recursive function to find sum of  $n$  numbers.
29. Write greedy algorithm for job sequencing with deadlines.
30. Differentiate Merge sort and Quick sort with example.
31. Why do we use asymptotic notation in the study of algorithm? Describe commonly used asymptotic notations and give their significance.

(6 × 4 = 24)

### Part D (Essays)

*Answer any two questions.  
Each question carries 15 marks.*

32. What do you mean by complexity of an algorithm ? Explain the meaning of worst case analysis and best case analysis with an example.
33. Explain basic Binary tree traversal methods.
34. Explain Prim's algorithm for finding minimum tree with example. Calculate its complexity.
35. Explain 8 Queens problem using backtracking.

(2 × 15 = 30)