Reg. No. :

Question Paper Code : 52373

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017

Fourth Semester

Computer Science and Engineering

CS 2251 – DESIGN AND ANALYSIS OF ALGORITHMS

(Regulations 2008)

(Common to PTCS 2251 – Design and Analysis of Algorithms for B.E. (Part-Time)
Third Semester – CSE – Regulations 2009)

Time : Three Hours   Maximum : 100 Marks

Answer ALL questions.

PART – A   (10×2=20 Marks)

1. What is an Algorithm ?

2. How the algorithm's time efficiency is measured ?

3. Sort the following elements using merge sort. 18, 26, 32, 6, 43, 15, 9, 1.

4. What is median of three partitioning ?

5. What is Dynamic programming ?

6. Define Multistage Graphs.

7. State the general backtracking method.

8. What is graph colouring problem ?

9. What is a Bi-connected Graph ?

10. What is an articulation point in a graph ?

PART – B   (5×16=80 Marks)

11. a) Discuss in detail all the asymptotic notations with examples.   (16)

                                (OR)

   b) Write the linear search algorithm and analyses for its best, worst and average
      case time complexity.   (16)

12. a) Explain the binary search with suitable example using divide and conquer strategy. (16)

(OR)

b) i) Write with suitable illustration prove the optimality of the container loading greedy algorithm. (8)

ii) Suppose you have 8 containers whose weights are 100, 200, 50,90, 150, 50, 20 and 80 a ship whose capacity is 400. Use the above algorithm to find an optimal solution to this instance of the container loading problem. (8)

13. a) Describe binary search tree with three traversal patterns ? Give suitable example with neat diagram for all three traversal of binary search tree. (16)

(OR)

b) Solve the all-pair shortest-path problem for the digraph with the following weight matrix. (16)

0	2	∞	1	8
6	0	3	2	∞
∞	∞	0	4	∞
∞	∞	2	0	3
3	∞	∞	∞	0

14. a) What is Hamiltonian problem ? Explain with an example using backtracking. (16)

(OR)

b) How does backtracking work on the 8 Queens problem, explain with suitable example ? (16)

15. a) With an example, explain how the branch-and-bound technique is used to solve 0/1 knapsack problem. (16)

(OR)

b) Explain spanning tree for the following graph. (16)