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Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FOURTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), MAY 2019
Course Code: IT202
Course Name: ALGORITHM ANALYSIS AND DESIGN (IT)

Max. Marks: 100   Duration: 3 Hours

PART A
Answer any two questions, each carries 15 marks

Marks

1. a) Solve $T(n)=3T(n/4)+n$ by using Iteration method. (7)
   b) Design a recursive binary search algorithm .Illustrate with an example. (8)
2. a) Compare asymptotic notations with examples. (7)
   b) Design a recursive algorithm to find maximum and minimum from a set of numbers. (8) Illustrate with an example.
3. a) Solve the recurrence equation $T(n)=2T(n/2)+c$ by using recursion trees. (7)
   b) How we can say that Strassen's matrix multiplication algorithm is more efficient than (8) ordinary matrix multiplication algorithm?

PART B
Answer any two questions, each carries 15 marks

4. a) Illustrate knapsack problem with an example. (5)
   b) Explain 4-queens problem by backtracking method. (10)
5. a) Describe branch and bound technique. Demonstrate a problem that can be solved by branch (10) and bound method
   b) Write an algorithm to find minimum cost spanning tree of a graph using PRIM's algorithm. (5)
6. a) Explain Monte Carlo method for finding the efficiency of backtracking technique. (6)
   b) Explain Kruskal's algorithm. Find the minimum cost spanning tree of the graph whose (9) vertices are v1,v2,v3,v4,v5,v6, and v7. And the cost of the graph's edges are (v1,v2)=28,(v1,v6)=10,(v6,v5)=25,(v5,v4)=22,(v5,v7)=24,(v7,v2)=14,(v2,v3)=16,(v3,v4)=12 and (v4,v7)=18.

PART C
Answer any two questions, each carries 20 marks

7. a) Describe principle of optimality. (5)
   b) Write an algorithm to find the vertex cover of a given graph. (5)
   c) Explain Rabin-karp algorithm for string matching with an example (10)

8 a) Solve multistage graph problem using forward approach with example.   (12)

   b) Write the Las Vagas algorithm for searching a given element in an array of n numbers.   (8)

9 a) Find the lower bound of comparison based sorting. Draw the comparison tree for sorting 3 (8)
       numbers.

   b) Differentiate between deterministic and nondeterministic algorithms.   (4)

   c) Explain all pairs shortest path algorithm.   (8)

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