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B4C102

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Reg. No. _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FOURTH SEMESTER B.TECH DEGREE EXAMINATION, JUNE 2017

Course Code: **IT202**

Course Name: **ALGORITHM ANALYSIS AND DESIGN (IT)**

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any 2 questions.

- 1 a. What is an asymptotic notion? Give the different notations used to represent the complexity of algorithms? (10)
- b. Write down the control abstraction for divide and conquer? (5)
- 2 a. Give the divide and conquer solution for binary search and analyze its complexity? (8)
- b. What is a recurrence relation? Solve $T(n) = 2T(n/2) + C$ using recurrence trees. (7)
- 3 a. How we can prove that Strassen's matrix multiplication is advantageous over ordinary matrix multiplication? (10)
- b. Solve the recurrence relation $T(N) = T(n-1) + 1$ and $T(1) = \Theta(1)$ using iteration method. (5)

PART B

Answer any 2 questions

- 4 a. Explain (i) State space tree (9)
(ii) Fixed tuple formulation
(iii) Variable tuple formulation
- b. Solve knapsack problem $n=3$ $m=20$ $(P_1, P_2, P_3)=25$ (6)
- 5 a. What is back-tracking? Give one problem that can be solved by back-tracking? (5)
- b. What is minimum spanning tree? Explain Prim's algorithm to find minimum spanning tree? (10)
- 6 a. What is the relevance of Least cost search? Give the control abstraction for Least cost search. (8)
- b. Give the general Knap-sack problem. Suggest a method for solving it. (7)

PART C

Answer any 2 questions.

- 7 a. Describe Rabin-Karp algorithm for pattern matching (12)
- b. Differentiate between deterministic and non-deterministic algorithms? (5)
- c. What are approximation algorithms? (3)
- 8 a. Explain the backward approach in solving multistage graph problems. (12)

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- b. What are comparison trees? How it can be used to find the lower bound of ordered searching (8)
- 9 a. What are randomized algorithms? Illustrate Las-Vegas randomized algorithm for performing quick sort on a set of integers. (10)
- b. Explain vertex cover problem using an example. Suggest an algorithm for finding vertex cover of a graph. (10)
