Total number of printed pages–3

53 (CS 503) DAAL

2019

DESIGN & ANALYSIS OF ALGORITHM

Paper : CS 503

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **all** questions.*

1. Consider the following recursive relation and compute the complexity in terms of Big-Oh notation.

   (a) $T(n) = n + T(n/2)$

   (b) $T(n) = n^2 + T(n-1)$

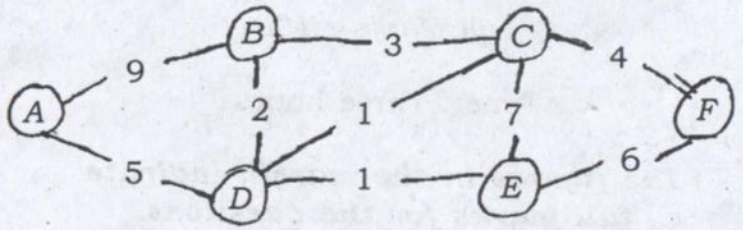
   10+10=20

Contd.

2. *(a)* Write a greedy algorithm for computing Minimum Spanning Tree of a graph.

(b) Compute the complexity of the above mentioned problem.

(c) Apply your algorithm and show the output of your algorithm.



10+5+5=20

3. Consider the following algorithm for Fibonacci series.

$f(n)=n$ if $n=0$ or $n=1$

$f(n)=f(n-1)+f(n-2)$ else.

(a) Computer the time complexity of the above algorithm in terms of Big-Oh.

(b) Write an algorithm using dynamic programming to solve the above problem and compute the time complexity. 10+10

4. Use branch and bound to solve the following TSP problem. 20

	A	B	C	D	E
A	∞	7	3	4	1
B	7	∞	2	1	3
C	3	2	∞	3	5
D	4	1	3	∞	4
E	1	3	5	4	∞

5. *(a)* Write the Cook's theorem.

(b) With example, discuss the following terms :

(i) P

(ii) NP

(iii) NP-Hard

(iv) NP-Complete.

4+16