

Total No. of Questions : 6]

SEAT No. :

P1447

[Total No. of Pages : 2

TE/Insem/APR-146
T.E. (I.T.) (Semester - II)
DESIGN AND ANALYSIS OF ALGORITHMS
(2015 Pattern)

Time :1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) *Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data if necessary.*

- Q1) a)** Prove by Mathematical Induction that for each positive number n
 $1+2+3+ \dots +n=n(n+1)/2$. [5]
- b)** Explain Aggregate and Accounting method with the example of stack operation. [5]

OR

- Q2) a)** Solve the following Recurrence relation using substitution method and write the time complexity. [5]
- $$T(n) = 2 T(n/2) + n \quad n > 1$$
- $$T(n) = 1 \text{ if } n=1$$
- b)** Find Brute force solution to 8 queen's problem. [5]

- Q3) a)** What is divide and conquer method? Explain control abstraction algorithm of divide and conquer method. [5]
- b)** Write down the algorithm for binary search and solve the recurrence relation for it using substitution method. [5]

OR

- Q4) a)** Write a recursive algorithm for finding maximum and minimum using divide and conquer and verify its time complexity. [5]
- b)** Solve the optimal storage on tapes problem using greedy method Let $n=3$ and $(11, 12, 13) = (5, 10, 3)$ find the optimal ordering. [5]

P.T.O.

- Q5) a) Explain the Principle of Optimality. [2]
 b) Compute and construct OBST for the given values using dynamic programming. [8]

$N = 3, (a_1, a_2, a_3) = (\text{do}, \text{if}, \text{int})$

$p(1:3) = (4, 2, 1), q(0:3) = (2, 3, 1, 5)$

OR

- Q6) a) Solve the travelling salesman problem with associated cost adjacency matrix using dynamic programming. [5]

	A	B	C	D
A	0	4	2	1
B	4	0	13	9
C	2	13	0	8
D	1	9	8	0

- b) Find minimum cost path from source (s) to sink (t) of the following multistage graph. [5]

