Total No. of Questions : 6]

SEAT No. :

P1447

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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+ ..... +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]**

$T(n) = 2\ T(n/2) + n \qquad n>1$

$T(n) = 1$ 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, (al, a2, a3) = (do, if, 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]**