Total No. of Questions : 6]

SEAT No. :

P51

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TE/INSEM/APR-56
T.E. (Information Technology)
314452: DESIGN AND ANALYSIS OF ALGORITHMS
(2015 Pattern) (Semester - II)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) ***Answers Q1. or Q2., Q3. or Q4., Q5. or Q6.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Explain Aggregate method with an example of stack. And find amortized cost of following sequence of push and pop operations. Assume that the cost of push and pop operation is 1. Sequence is given as follows: 1 Push 1 Push 1 Push 1 Pops 2 Push 2 Pops 2 Push 2 Pops **[5]**

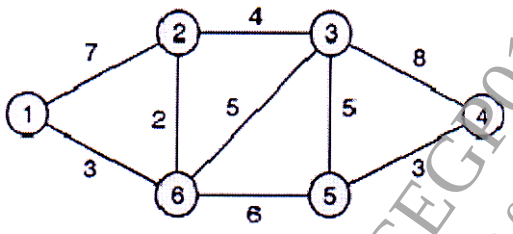
b) State Advantages and Disadvantages of Brute Force Method. **[5]**

OR

Q2) a) State Titling problem. Prove by mathematical induction that "the Titling problem can always be solved". **[5]**

b) Write an Algorithm and recurrence relation with initial condition of "Tower of Hanoi Problem". Find it's time efficiency using backward substitution method. **[5]**

Q3) a) Find Dijkstra's shortest path from vertex 1 for the following graph. **[6]**



b) Write and explain the control abstraction of divide and conquer strategy. **[4]**

P.T.O.

OR

Q4) a) Solve the following job sequencing with deadlines problem. n = 7, Profits(p1,p2,.....,p7)={3,5,20,18,1,6,30}Deadlines(dl,d2 ,.....,d7)={1,3,4,3,2,1,2}. **[6]**

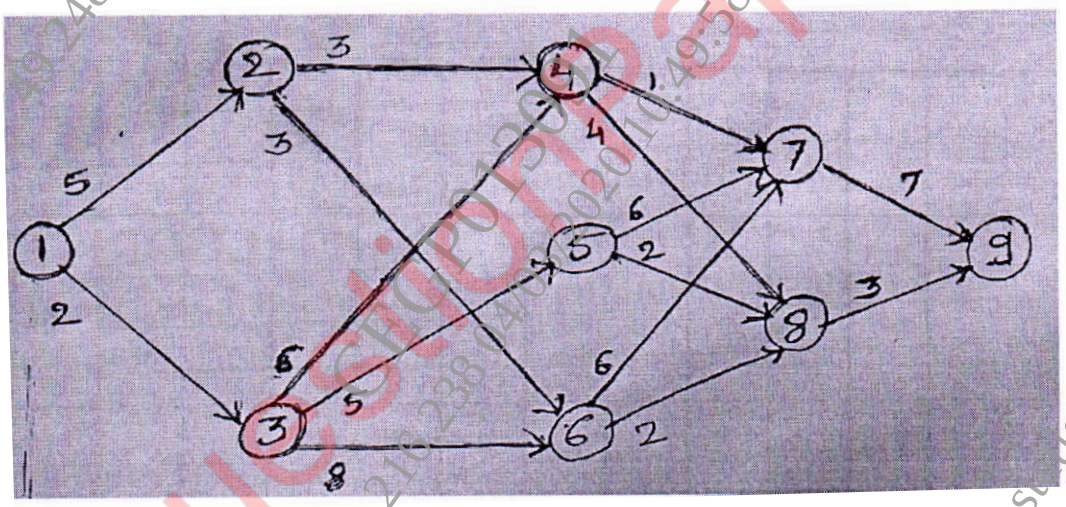
b) Write a recurrence relation of the best-case of quick sort and determine its time complexity. **[4]**

Q5) a) Find the optimal binary search tree for the key and probabilities given below. N=4, a(l:4)=(for,if,main,switch) and the values for P's and Q's are given as P(1:4)=(2,2,3,l) and Q(0:4)=(4,3,1,1,2). **[8]**

b) Explain Principal of Optimality. **[2]**

OR

Q6) a) Find minimum cost path from source (1) to sink (t) of the above multistage graph. **[6]**



b) Compare dynamic programming with divide & Conquer. **[4]**

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