Total No. of Questions : 4]

SEAT No. :

P8581

[Total No. of Pages : 2

Oct-22/TE/Insem-561

T.E. (Information Technology)

DESIGN AND ANALYSIS OF ALGORITHM

(2019 Pattern) (Semester - I) (314445(A)) (Elective - I)

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

Instructions to the candidates :

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

Q1) a) Explain asymptotic notations : Big O, Omega, and Theta notations with suitable example. **[5]**

b) Suppose you have algorithms with the five running times listed below. (Assume these are the exact running times). How much slower do each of these algorithms get when you (a) double the input size, or (b) increase the input size by one? **[5]**

i) n 3 ii) 100n 2

iii) n log n iv) 2 n

c) What is exhaustive search? Explain with example. **[5]**

OR

Q2) a) If f(n) = n! and g(n) = 2n, indicate whether f = O(g), or f = Ω(g), or both (f = θ(g)). **[5]**

b) Solve T(n)=2T(n/2)+2 if n>2=1 if n=2 Using iteration method. **[5]**

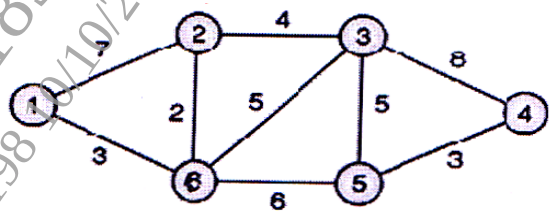
c) Find Brute Force solution to 8 Queens Problem. **[5]**

P.T.O.

Q3) a) Write a recurrence relation of the divide and conquer algorithm to find max-min in an array and solve it by substitution method. **[5]**

b) Compare Prim's and Kruskal's algorithm. **[5]**

c) Find Dijkstra's shortest path from vertex 1 for the following graph. **[5]**



OR

Q4) a) Describe optimal storage on tapes problem and solve the following instance using the greedy approach. The number of files n = 8, number of tapes m = 2 with storage capacities T_1 = 80 and T_2 = 120, Lengths of the files L (1 : 8) = (15, 10, 5, 20, 35, 30, 50, 40). Compute the MRTs of each tape when round-robin storage scheme is applied. **[10]**

b) Write and explain the control abstraction of divide and conquer strategy. **[5]**

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