Total No. of Questions :6]

SEAT No. :

P107

[Total No. of Pages :2

APR. -16/TE/Insem. - 44

T.E. (Information Technology)

DESIGN AND ANALYSIS OF ALGORITHMS

(2012 Pattern) (314449) (Semester - II)

Time : 1Hour] *[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 whenever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) Reorder the following complexities from the smallest to the largest. **[10]**

a) $n\log_2 n$, $n+n^2+n^3$, 2^4, sqrt(n)

b) n^2, 2^n, $n\log_2 n$, $\log_2 n$, n^3

c) $n\log_2 n$, n^8, $n^2/\log_2 n$, (n^2-n+1)

d) $n!$, 2^n, $(n+1)!$, 2^{2n}, n^n, $n^{\log n}$

OR

Q2) a) Prove by mathematical induction: "Tiling problem can always be solved". **[6]**

b) Explain in brief Aggregate analysis technique used in Amortized analysis. **[4]**

Q3) Analyze Kruskal's algorithm of minimum cost spanning tree using greedy approach find out minimum cost spanning tree using Kruskal's algorithm for given graph. **[10]**

Edge	Cost		Edge	Cost
(a,b)	3		(c,d)	6
(a,f)	5		(c,f)	4
(a,e)	6		(f,d)	5
(b,c)	1		(f,e)	2
(b,f)	4		(e,d)	8

OR

P.T.O.

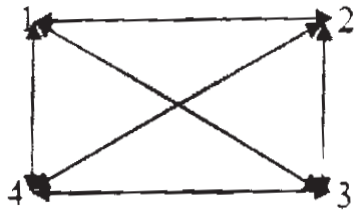
Q4) a) Solve the following instance of job sequencing problem using greedy approach. Let n = 6, profit p (1:6) = (30, 20, 15, 10, 5, 1) and deadlines d (1:6) = (4,2,2,1,4,3). **[6]**

b) Analyze the time complexity of Strassen's matrix multiplication using divide and conquer strategy. **[4]**

Q5) N=4 and (a1, a2, a3, a4) = (DAA, ITPM, OS, SP). Let p (1:4) = (3,3,1,1) and q(0:4) = (2,3,1,1,1). Compute & construct OBST for above value using dynamic programming. **[10]**

OR

Q6) a) Find the solution of the following travelling sales person problem using Dynamic approach. **[6]**



$$\begin{pmatrix} 0 & 10 & 15 & 20 \\ 5 & 0 & 9 & 10 \\ 6 & 13 & 0 & 12 \\ 8 & 8 & 9 & 0 \end{pmatrix}$$

b) Compare dynamic programming with greedy approach. **[4]**