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Reg. No. : | | | | | | | | | | |

Question Paper Code: 55804

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Fifth Semester

Information Technology

15UIT504 - ANALYSIS AND DESIGN OF ALGORITHMS

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

PART A - (5 x 1 = 5 Marks)

1. Function g is a lower bound on function f if for all x. CO1- R

(a) $g(x) \leq f(x)$ (b) $g(x) \geq f(x)$ (c) $g(x) = O(f)$ (d) $F(x) = \Omega(g)$

2. Scatter plots of functions in $\Theta(n \lg n)$ and $\Theta(n^2)$ will have _____ shape. CO2- R

(a) Concave (b) Linear (c) Convex (d) inComparable

3. The count denotes number of times of execution of statement is CO3- R

(a) Frequency count (b) Space count (c) Time count (d) Optimization

4. Knapsack is a(n) _____ problem CO4 -R

(a) non-optimization (b) optimization

(c) state-space search (d) behavior-of-program

5. All NP-Complete problems are NP-hard but all NP-hard problems cannot be CO5 -R

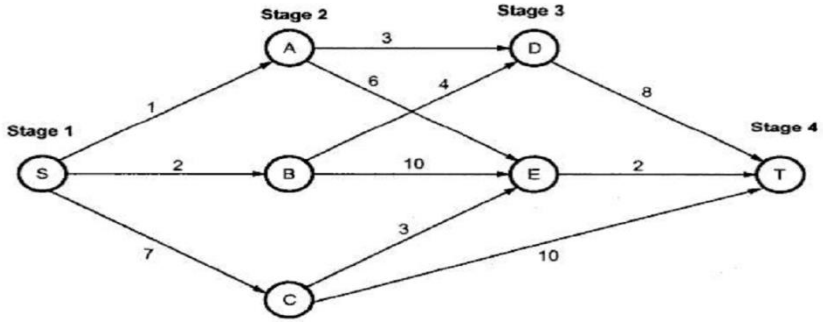
(a) P (b) NP (c) NP – Hard (d)NP- Complete

PART - B (5 x 3 = 15 Marks)

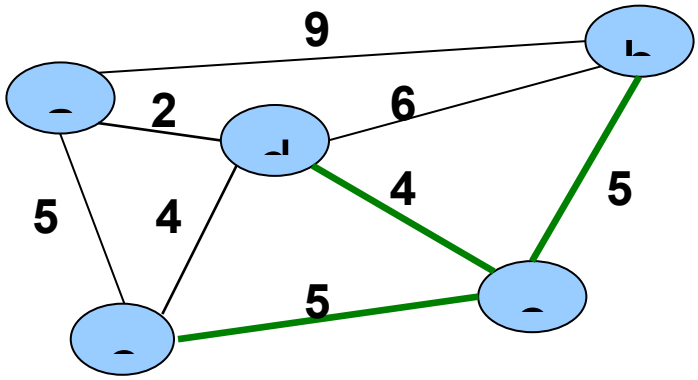
6.	Name the criteria used to identify the best algorithm.	CO1 -R	
7.	Elucidate time complexities of bubble sort.	CO2- R	
8.	Write an algorithm to find the minimum cost spanning tree of an undirected, weighted graph.	CO3- R	
9.	Classify the application of backtracking.	CO4- R	
10.	Elaborate the real time application of the assignment problem?	CO5 -Ana	

PART – C (5 x 16= 80Marks)

11.	(a)	Solve the following recurrence relation by masters' method. 1) T(n)=4T(n/2)+n 2)T(n)=2T(n/2)+ nlogn.	CO1 -App	(16)
		Or		
	(b)	Analyze linear search for Best case, worst case and average case with an algorithm.	CO1- Ana	(16)
12.	(a)	For the following set of elements, Explain Binary Search With Analysis. 10,20,30,40,50,60,70.	CO2 -Ana	(16)
		Or		
	(b)	Find the minimum cost path of Multi stage Graph using forward approach and using backward approach of multistage Graph with algorithm.	CO2 -Ana	(16)



13. (a) Elucidate the minimum spanning tree with the help of prim's algorithm and show the result for the given graph. CO3- App (16)



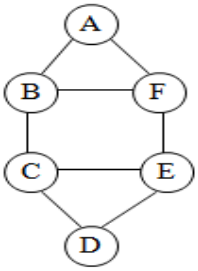
Or

(b) Show the result for the given graph by the use of dijikstra's algorithm. CO3 -U (16)

14. (a) Consider a set A = {1, 2, 5, 6, 8} and d = 9.Solve it for obtaining sum of subsets and draw a portion of state space tree. CO4 -U (16)

Or

(b) Solve the following Graph Coloring Problem Using Backtracking Technique. CO4 -Ana (16)



15. (a) Elucidate NP-hard and NP complete problems with example. CO5- U (16)

Or

(b) Give the non-deterministic algorithm for sorting elements in non decreasing order. CO5- U (16)