Hall Ticket Number:										

### IV/IV B.Tech (Supplementary) DEGREE EXAMINATION

## November, 2019

# **Common to CSE & IT** Design and Analysis of Algorithms

		n Semester nree Hours	Design and Analysis of Algorithms Maximum: 60 Marks				
Ansi	ver (	Question No.1 compulsorily.	(1X12 = 12  Marks)				
		<i>DNE question from each unit.</i>	(4X12=48  Marks)				
1.		swer all questions	(1X12=10  Marks) (1X12=12 Marks)				
1.	a)	Illustrate the factors which effect the running time o					
	b)	Compare the relation between O and $\Omega$ .					
	c)	What is the best case time complexity of merge sort	9				
	d)	Compare feasible and optimal solution.					
	e)	Define purging rule.					
	c) f)	Discuss principle of Optimality.					
	· ·	Define Bi- connected component.					
	g) b)						
	h)	Discuss the concept of sum of sub set problem.					
	i)	What is the DFS sequence for the following graph?					
	j)	Discuss the approach of Branch and Bound?					
	k)	State satisfiability problem.					
	1)	Differentiate deterministic and non deterministic alg	zorithms?				
	,	UNIT					
2.	a)	Explain about Strassen's Matrix Multiplication with	example? 6M				
	b)	Write the algorithm for merge sort and analyze time	*				
	0)	(OR)	complexity:				
3.	a)	Write the algorithm for linear search and analyze the	e time complexity of binary search algorithm. 6M				
5.	b)	Sort the following elements get using quick sort	6M				
	0)	[310,285,179,652,351,42					
		UNIT ]	-				
4.	a)	Construct minimum cost spanning tree for the					
т.	a)	following weighted undirected graph using					
		prim's and kruskal's algorithm.	9 3				
			6 2 6 14 9 3 11 4 1 7 2 15 6 6 M				
	b)	For the following graph find minimum cost tour					
	-,	for the travelling salesperson problem using dynamic programming.	$\begin{array}{c} 1 \\ 1 \\ 0 \\ 15 \\ 9 \\ 9 \\ 9 \\ 4 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 $				

6M

**P.T.O.** 

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12

# **CS 414**

#### (OR)

5.	a)	What is the solution generated by function Job Sequencing algorithm when $n=6$ (P1p6) = (3, 5, 20, 18, 1, 6), and (d1d6) = (1, 3, 4, 3, 2, 1).	6M								
	b)	Apply dynamic programming concept to find the longest common sequence.	6M								
		UNIT III									
6.	a)	Explain Depth first search graph travelling technique with example and write the algorithm for DFS?	6M								
	b)	Device backtracking algorithm to find all solutions to the n-queens problem and represent the 6M solution space in state space tree.									
		(OR)									
7.	a)										
,.	b)										
	b) Explain Bi connected components with example? 6M UNIT IV										
8.	a)	Generate minimum length tour for the given cost adjacency matrix using branch and bound.	6M								
0.	ч)		0111								
		$\begin{bmatrix} \infty & 18 & 28 & 8 & 9 \\ 13 & \infty & 14 & 2 & 1 \end{bmatrix}$									
		13 00 14 2 1									
		1 3 00 1 2									
		17 4 16 ∞ 1									
		$\begin{array}{cccccccccccccccccccccccccccccccccccc$									
	b)	Explain NP hard and NP complete problems with examples?	6M								
	0)		0111								
0	``	(OR)	6M								
9.	a)	Explain the principles of LC Branch- and-Bound?									
	b)	Differentiate P class and NP class problems and explain with examples?	6M								

### Hall Ticket Number:

### **IV/IV B.Tech (Supplementary) DEGREE EXAMINATION**

### November, 2019 Seventh Semester

### Computer Science and Engineering Design & Analysis of Algorithms Maximum: 60 Marks

Time: Three Hours

Answer Question No.1 compulsorily.

	~	mestion  No.1 compulsorily. (1X12 = 12 M)	
$\frac{ANSV}{1}$	1	DNE question from each unit. (4X12=48 M   Question from each unit. (1X12=12 M	/
1.		swer all questions (1X12=12 M Illustrate the factors which effect the running time of the algorithm?	arks)
	a) b)	Compare the relation between O and $\Omega$ .	
	0)		
	c)	What is the best case time complexity of merge sort?	
	d)	Compare feasible and optimal solution.	
	e)	Define purging rule.	
	f)	Discuss principle of Optimality.	
	g)	Define Bi- connected component.	
	h)	Discuss the concept of sum of sub set problem.	
	i)	What is the DFS sequence for the following graph?	
	j)	Discuss the approach of Branch and Bound?	
	k)	State satisfiability problem.	
	1)	Differentiate deterministic and non deterministic algorithms?	
		UNIT I	
2.	a)	Explain about Strassen's Matrix Multiplication with example?	6M
	b)	Write the algorithm for merge sort and analyze time complexity.	6M
	,	(OR)	
3.	a)	Write the algorithm for linear search and analyze the time complexity of binary search algorithm.	6M
	b)	Sort the following elements get using quick sort [310,285,179,652,351,423,861,254,450,520]	6M
		UNIT II	
4.	a)	Construct minimum cost spanning tree for the following weighted undirected graph using prim's and kruskal's algorithm.	6M

(1X12 = 12 Marks)

			1
		$\begin{array}{c} 9 \\ 6 \\ 2 \\ 14 \\ 9 \\ 1 \\ 7 \\ 2 \\ 15 \end{array}$	
	b)	For the following graph find minimum cost tour for the travelling salesperson problem using dynamic programming.	6M
		(OR)	1
5.	a)	What is the solution generated by function Job Sequencing algorithm when n=6 (P1p6) = (3, 5, 20, 18, 1, 6), and (d1d6) = (1, 3, 4, 3, 2, 1).	6M
	b)	Apply dynamic programming concept to find the longest common sequence.	6M
		UNIT III	
6.	a)	Explain Depth first search graph travelling technique with example and write the algorithm for DFS?	6M
	b)	Device backtracking algorithm to find all solutions to the n-queens problem and represent the solution space in state space tree.	6M
		(OR)	
7.	a)	Explain about knapsack problem using back tracking?	6M
	b)	Explain Bi connected components with example?	6M
8.	a)	UNIT IVGenerate minimum length tour for the given cost adjacency matrix using branch and bound. $\begin{bmatrix} \infty & 18 & 28 & 8 & 9 \\ 13 & \infty & 14 & 2 & 1 \\ 1 & 3 & \infty & 1 & 2 \\ 17 & 4 & 16 & \infty & 1 \\ 14 & 2 & 5 & 16 & \infty \end{bmatrix}$	6M
	b)	Explain NP hard and NP complete problems with examples?	6M
	/	(OR)	1
9.	a)	Explain the principles of LC Branch- and-Bound?	6M
			6M