	ANALYSIS O	F ALGORITHM	S		
[As per Choice E	Based Credit Syste	em (CBCS) schemel			
(Effective fro	om the academic y	rear 2016 -2017)			
	SEMESTER -				
Subject Code	15CS43	IA Marks		20	
Number of Lecture Hours/Week	04	Exam Marks		80	
Total Number of Lecture Hours	50	Exam Hours		03	
	CREDITS -				
Course objectives: This course will e	nable students to				
 Explain various computational 	al problem solving	techniques.			
 Apply appropriate method to s 	solve a given probl	em.			
 Describe various methods of a 	algorithm analysis				
Module 1	<i></i>			Tanakin	
				Teachin Hours	
Introduction: What is an Algorith	m? (T2:1.1), Ale	orithm Specification	(T2·1 2)	10 Hour	
Allalysis Framework (11:2.1), Per	rformance Analy	sis: Space complexit	v Time	10 Hour	
complexity (T2:1.3). Asymptotic Not	ations: Big-Oh no	tation (Q) Omega nota	tion (O)		
Theta notation (@), and Little-oh nota	tion (a) Mathema	tical analysis of Non E	20011 (22),	No. Pro-	
and recursive Algorithms with Examp	les (T1:2.2.2.3.2	1) Important Duckler	Cecursive	4.	
Sorting, Searching, String processing	ng Granh Proble	ems Combinatorial D	n Types:		
Fundamental Data Structures: Stac	ks. Queues Granh	s Trees Sets and Dist	robiems.	- V 1 (4) - V	
(T1:1.3,1.4)	, Queues, Graph	s, rices, sets and Dici	ionaries.	P	
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Module 2					
	od. Binary search	Recurrence equation 5	41-11	40.77	
Divide and Conquer: General metho	od, Binary search,	Recurrence equation for	or divide	10 Hour	
Divide and Conquer: General metho and conquer, Finding the maximum ar	nd minimum (T2:3	1. 3.3. 3.4) Merge so	rt Ouisle	10 Hour	
Divide and Conquer: General metho and conquer, Finding the maximum ar sort (T1:4.1, 4.2), Strassen's mai	nd minimum (T2:3 trix multiplication	1, 3.3, 3.4), Merge son	rt, Quick	10 Hour	
Divide and Conquer: General metho and conquer, Finding the maximum ar sort (T1:4.1, 4.2), Strassen's man Disadvantages of divide and conquer.	nd minimum (T2:3 trix multiplication	1, 3.3, 3.4), Merge son	rt, Quick	10 Hour	
Divide and Conquer: General metho and conquer, Finding the maximum ar sort (T1:4.1, 4.2), Strassen's man Disadvantages of divide and conquer. Sort. (T1:5.3)	nd minimum (T2:3 trix multiplication	1, 3.3, 3.4), Merge son	rt, Quick	10 Hour	
Divide and Conquer: General metho and conquer, Finding the maximum ar sort (T1:4.1, 4.2), Strassen's mar Disadvantages of divide and conquer. Sort. (T1:5.3) Module 3	nd minimum (T2:3 trix multiplication Decrease and Co	1.1, 3.3, 3.4), Merge son 1 (T2:3.8), Advantage 1 nquer Approach: Top	rt, Quick ges and pological		
Divide and Conquer: General metho and conquer, Finding the maximum ar sort (T1:4.1, 4.2), Strassen's mar Disadvantages of divide and conquer. Sort. (T1:5.3) Module 3 Greedy Method: General method, of	nd minimum (T2:3 trix multiplication Decrease and Co	1.1, 3.3, 3.4), Merge son 1 (T2:3.8), Advantage 1 nquer Approach: Top	rt, Quick ges and pological		
Divide and Conquer: General metho and conquer, Finding the maximum ar sort (T1:4.1, 4.2), Strassen's man Disadvantages of divide and conquer. Sort. (T1:5.3) Module 3 Greedy Method: General method, of sequencing with deadlines (T2:4.1, 4	nd minimum (T2:3 trix multiplication Decrease and Co Coin Change Prol 3, 4.5). Minimum	1.1, 3.3, 3.4), Merge soin (T2:3.8), Advantage and Approach: Topolem, Knapsack Problem, Cost spanning trees	rt, Quick ges and pological		
Divide and Conquer: General metho and conquer, Finding the maximum ar sort (T1:4.1, 4.2), Strassen's mar Disadvantages of divide and conquer. Sort. (T1:5.3) Module 3 Greedy Method: General method, of sequencing with deadlines (T2:4.1, 4 Algorithm, Kruskal's Algorithm (T1:9	nd minimum (T2:3 trix multiplication Decrease and Co Coin Change Prol .3, 4.5). Minimum 0.1, 9.2). Single so	1.1, 3.3, 3.4), Merge son 1 (T2:3.8), Advantage 1 (T2:3.8), Advant	rt, Quick ges and pological em, Job : Prim's		
Divide and Conquer: General metho and conquer, Finding the maximum ar sort (T1:4.1, 4.2), Strassen's mar Disadvantages of divide and conquer. Sort. (T1:5.3) Module 3 Greedy Method: General method, of sequencing with deadlines (T2:4.1, 4 Algorithm, Kruskal's Algorithm (T1:9.3). Optimal Tree	nd minimum (T2:3 trix multiplication Decrease and Co Coin Change Prol. 3, 4.5). Minimum 0.1, 9.2). Single so problem: Huffma	of the cost spanning trees urce shortest paths: I	rt, Quick ges and pological em, Job : Prim's		
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Divide and Conquer: General metho and conquer, Finding the maximum ar sort (T1:4.1, 4.2), Strassen's mar Disadvantages of divide and conquer. Sort. (T1:5.3) Module 3 Greedy Method: General method, General method	nd minimum (T2:3 trix multiplication Decrease and Co Coin Change Prol 3, 4.5). Minimum 1, 9.2). Single so problem: Huffma Heaps and Heap S	of the cost spanning trees urce shortest paths: In Trees and Codes (ort (T1:6.4).	rt, Quick ges and pological em, Job : Prim's Dijkstra's T1:9.4).	10 Hour	
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Divide and Conquer: General metho and conquer, Finding the maximum ar sort (T1:4.1, 4.2), Strassen's mar Disadvantages of divide and conquer. Sort. (T1:5.3) Module 3 Greedy Method: General method, osequencing with deadlines (T2:4.1, 4.4.1), Algorithm, Kruskal's Algorithm (T1:9.4.1), Algorithm (T1:9.4.1), Optimal Tree Transform and Conquer Approach: Module 4 Dynamic Programming: General method, osequencing with deadlines (T2:4.1, 4.4.1), Algorithm (T1:9.3). Optimal Tree Transform and Conquer Approach: Module 4 Dynamic Programming: General method (T1:9.3), Transitive Closure: Warshall's Algorithm, Optimal Binary Search	Trees. Knapsack	ol. 1, 3.3, 3.4), Merge son (T2:3.8), Advantage and (T2:3.8), Advantage and Codes (Problem, Knapsack Problem cost spanning trees urce shortest paths: In Trees and Codes (Problem (T1:6.4).	em, Job : Prim's Dijkstra's T1:9.4).	10 Hour	
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Divide and Conquer: General metho and conquer, Finding the maximum ar sort (T1:4.1, 4.2), Strassen's mai Disadvantages of divide and conquer. Sort. (T1:5.3) Module 3 Greedy Method: General method, osequencing with deadlines (T2:4.1, 4.4) Algorithm, Kruskal's Algorithm (T1:9.4) Algorithm (T1:9.3). Optimal Tree Transform and Conquer Approach: Module 4 Dynamic Programming: General method. (T2:5.4). Transitive Closure: Warshall's Algorithm, Optimal Binary Search Bellman-Ford Algorithm (T2:5.4), Transdesign (T2:5.8). Module 5 Backtracking: General method (T2:7.4)	coin Change Prol. 3, 4.5). Minimum (72:3 Minimum Coin Change Prol. 3, 4.5). Minimum Coin Change Prol. 3, 4.5). Minimum Coin Change Prolem: Huffma Heaps and Heap Stalgorithm, All Trees, Knapsack welling Sales Personal Coin Change Prolem: Minimum Coin Chan	c.1, 3.3, 3.4), Merge son (T2:3.8), Advantage and (T2:3.8), Advantage and Codes (T1:6.4). Despite the content of the cost spanning trees and Codes (Cort (T1:6.4). Despite the cost spanning trees and Codes (Cort (T1:6.4). Despite the cost spanning trees and Codes (Cort (T1:6.4). Despite the cost spanning trees and Codes (Cort (T1:6.4). Despite the cost spanning trees and Codes (Cort (T1:6.4). Despite the cost spanning trees and Codes (Cort (T1:6.4).	em, Job : Prim's Dijkstra's T1:9.4). (T2:5.1, Floyd's 3, 8.4), eliability	10 Hours	
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and conquer, Finding the maximum ar sort (T1:4.1, 4.2), Strassen's mar Disadvantages of divide and conquer. Sort. (T1:5.3) Module 3 Greedy Method: General method, sequencing with deadlines (T2:4.1, 4 Algorithm, Kruskal's Algorithm (T1:9 Algorithm (T1:9.3). Optimal Tree Transform and Conquer Approach: Module 4 Dynamic Programming: General method. Search Bellman-Ford Algorithm (T2:5.4), Transitive Closure: Warshall's Algorithm, Optimal Binary Search Bellman-Ford Algorithm (T2:5.4), Transitive Closure: Warshall's Algorithm (T2:5.8). Module 5 Backtracking: General method (T2:7. problem (T1:12.1), Graph coloring (T2 Bound: Assignment Problem, Tray	coin Change Prol. 3, 4.5). Minimum (72:3 and Co. 3, 4.5). Minimum (7.1, 9.2). Single so problem: Huffma Heaps and Heap States Algorithm, All 1 and Trees, Knapsack welling Sales Perso. 1, N-Queens prob. 2:7.4), Hamiltonian relling Sales Perso.	c.1, 3.3, 3.4), Merge son (T2:3.8), Advantage and (T2:3.8), Advantage and Codes (T2:3.8), Advantage and Codes (T1:6.4). The search of the code of (T1:6.4), and (T1:8.2, 8), and problem (T2:5.9), Research of the codes (T2:7.5). Brain son, problem (T1:12.1), Sum of the cycles (T2:7.5). Brain son, problem (T1:12.1)	rt, Quick ges and pological em, Job : Prim's Dijkstra's T1:9.4). (T2:5.1, Floyd's 3, 8.4), eliability	10 Hours	
Divide and Conquer: General metho and conquer, Finding the maximum ar sort (T1:4.1, 4.2), Strassen's mai Disadvantages of divide and conquer. Sort. (T1:5.3) Module 3 Greedy Method: General method, General	coin Change Prol. 3, 4.5). Minimum (72:3 and Co. 3, 4.5). Minimum (7.1, 9.2). Single so problem: Huffma Heaps and Heap S and Heaps and H	c.1, 3.3, 3.4), Merge son (T2:3.8), Advantage and (T2:3.8), Advantage and Codes (T2:3.8), Advantage and Codes (T2:6.4). Trees and Codes (T2:6.4). The problem (T1:8.2, 8.1), Pairs Shortest Paths: problem (T1:8.2), Results (T2:7.5), Results (T2:7.5), Brais on problem (T1:12.8), Brais on problem (T1:12.8), Results (T	em, Job em, Job rinn's Dijkstra's T1:9.4). (T2:5.1, Floyd's 3, 8.4), eliability	10 Hour	

concepts, non-deterministic algorithms, P, NP, NP-Complete, and NP-Hard classes (T2:11.1).

Course Outcomes: After studying this course, students will be able to

- Describe computational solution to well known problems like searching, sorting etc.
- · Estimate the computational complexity of different algorithms.
- Devise an algorithm using appropriate design strategies for problem solving.

Graduate Attributes

- Engineering Knowledge
- Problem Analysis
- Design/Development of Solutions
- Conduct Investigations of Complex Problems
- Life-Long Learning

Question paper pattern:

The question paper will have ten questions.

There will be 2 questions from each module.

Each question will have questions covering all the topics under a module.

The students will have to answer 5 full questions, selecting one full question from each module.

Text Books

- T1. Introduction to the Design and Analysis of Algorithms, Anany Levitin:, 2rd Edition, 2009. Pearson.
- T2. Computer Algorithms/C++, Ellis Horowitz, Satraj Sahni and Rajasekaran, 2nd Edition, 2014, Universities Press

Reference Books:

- Introduction to Algorithms, Thomas H. Cormen, Charles E. Leiserson, Ronal L. Rivest, Clifford Stein, 3rd Edition, PHI
- 2. Design and Analysis of Algorithms , S. Sridhar, Oxford (Higher Education)

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