LESSON PLAN

Subject: Analysis & Design of Algorithms

Subject code: PE-IT-S310A

Session: 2022-23

Semester: VI

LecturesCoveredMethodology1Introduction to Data Structures2Board2Introduction to Algorithms1PPT3Analysis of Algorithms, Designing techniques of algorithms1PPT4Concept of algorithmic efficiency Run time analysis of algorithms2Board5Asymptotic Notations1PPT6and conquer:Structure of divide and conquer:2COI7Recurrence Relationship2Website8Binary Search1Board9Quick Sort1Board10Straseen Multiplication1Board11Approximate solution (Knapsack problem), gragramming: Overview, difference between dynamic programming: Overview, programming and divide and conquer1PPT13Matrix multiplication1Board14Shortest paths1Video15Matrix multiplication1Board16Travelling salesman problem1Board17Longest common sequence.1Video19Solution to Knapsack problem using Backtracking approach2Board20Branch and bound application:1PPT21LC branch and bound application:1PPT22LC branch and bound application:1PPT23LC branch and bound application:1PPT24Unit 4 Cuabh Traversal: Overview,1Elin L earning	S.No	Торіс	No. of	CO	Teaching
1 Introduction to Data Structures 2 2 Introduction to Algorithms 1 3 Analysis of Algorithms, Designing techniques of algorithms 1 4 Concept of algorithms efficiency Run time analysis of algorithms 2 5 Asymptotic Notations 1 5 Asymptotic Notations 1 6 and conquer: Structure of divide and conquer: Structure of divide 2 COI 7 Recurrence Relationship 2 8 Binary Search 1 9 Quick Sort 1 10 Straseen Multiplication 1 11 Approximate solution (Knapsack 1 problem), PPT Board 12 Singles source shortest paths 1 13 difference between dynamic orquer PPT 14 Shortest path in graph 1 Flip Learning 15 Matrix multiplication 1 Board 16 Travelling salesman problem 1 Board 17 Longest commons equence. 1 Video 18 Backtracking: Overview, 8-			Lectures	Covered	Methodology
2 Introduction to Algorithms 1 PPT 3 Analysis of Algorithms, Designing techniques of algorithms 1 Board 4 Concept of algorithms efficiency Run time analysis of algorithms 2 PPT 5 Asymptotic Notations 1 PPT 6 and conquer: Structure of divide and conquer: Structure of divide and conquer algorithms and recurrence relationship 2 COI 7 Recurrence Relationship 2 Website Board 9 Quick Sort 1 PPT 10 Straseen Multiplication 1 Board 11 Approximate solution (Knapsack 1 PPT PPT 12 Singles source shortest paths 1 Video 13 difference between dynamic programming: Overview, 1 1 Board 15 Matrix multiplication 1 Board 17 Longest common sequence. 1 Video 18 Backtracking: Overview, 8-queen problem 1 Board 17 Longest common sequence. 1 Video 18 Backtracking approach 2 Board	1	Introduction to Data Structures	2		Board
2 PPT 3 Analysis of Algorithms, Designing techniques of algorithms 1 4 Concept of algorithms efficiency Run time analysis of algorithms 2 5 Asymptotic Notations 1 Divide and conquer: Structure of divide and conquer algorithms and recurrence relationship 2 7 Recurrence Relationship 2 8 Binary Search 1 9 Quick Sort 1 10 Strascen Multiplication 1 11 problem), problem), PPT 12 Singles source shortest paths 1 13 difference between dynamic programming and divide and conquer PPT 14 Shortest path in graph 1 15 Matrix multiplication 1 16 Traveling salesman problem 1 17 Longest common sequence. 1 18 Back tracking: Overview, 8-queen problem 2 19 Solution to Knapsack problem using Backtracking approach 1 20 Branch and bound 1 21 FIFO branch and bound 1 22 LC branch and bound 1 23 LC branch and bound application: 1 24 Unit 4 1	2	Introduction to Algorithms	1		
3 Analysis of Algorithms, Designing techniques of algorithmic efficiency 1 4 Concept of algorithmic efficiency 2 Run time analysis of algorithms 1 5 Asymptotic Notations 1 6 and conquer: Structure of divide and conquer algorithms and recurrence relationship 2 7 Recurrence Relationship 2 8 Binary Search 1 9 Quick Sort 1 10 Strascen Multiplication 1 10 Strascen Multiplication 1 11 Approximate solution (Knapsack problem), 1 PPT 12 Singles source shortest paths 1 Video Dynamic programming: Overview, 1 1 Board 13 difference between dynamic programming and divide and conquer PPT PPT 14 Shortest path in graph 1 Flip Learning 15 Matrix multiplication 1 Board 17 Longest common sequence. 1 Video 18 Back tracking: Overview, 8-queen problem 1 Board 20	2				PPT
3 techniques of algorithms Board 4 Concept of algorithmic efficiency 2 Run time analysis of algorithms 1 5 Asymptotic Notations 1 Divide and conquer: Structure of divide and conquer algorithms and recurrence relationship CO1 7 Recurrence Relationship 2 8 Binary Search 1 9 Quick Sort 1 10 Straseen Multiplication 1 11 Approximate solution (Knapsack problem), 1 12 Singles source shortest paths 1 13 difference between dynamic programming and divide and conquer PPT 14 Shortest path in graph 1 Flip Learning 15 Matrix multiplication 1 Board 17 Longest common sequence. 1 Video 18 Back tracking: Overview, 8-queen problem 2 Board 19 Solution to Knapsack problem using Backtracking approach 2 Board 20 Branch and bound: LC searching 1 PPT 21 FIFO branch and bound 1	2	Analysis of Algorithms, Designing	1		
4 Concept of algorithmic efficiency Run time analysis of algorithms 2 5 Asymptotic Notations 1 Divide and conquer: Structure of divide and conquer algorithms and recurrence relationship 1 PPT 7 Recurrence Relationship 2 Website 8 Binary Search 1 Board 9 Quick Sort 1 Board 10 Straseen Multiplication 1 Board 11 problem), PPT Board 12 Singles source shortest paths 1 Video Dynamic programming: Overview, 1 Board PPT 13 difference between dynamic programming and divide and conquer PPT PPT 14 Shortest path in graph 1 Flip Learning 15 Matrix multiplication 1 Board 16 Traveling salesman problem 1 Board 19 Solution to Knapsack problem using Backtracking: Overview, 8-queen problem 1 PPT 19 Solution to Knapsack problem using Backtracking approach 1 PPT 20 Branch and bound	3	techniques of algorithms			Board
4 Run time analysis of algorithms Image: structure of divide Image: structure of	4	Concept of algorithmic efficiency	2		
5 Asymptotic Notations 1 0 Divide and conquer: Structure of divide 2 6 and conquer algorithms and recurrence 2 7 Recurrence Relationship 2 8 Binary Search 1 9 Quick Sort 1 10 Straseen Multiplication 1 11 Approximate solution (Knapsack 1 problem), PPT 1 12 Singles source shortest paths 1 problem), PPT 1 13 difference between dynamic PPT programming and divide and conquer PPT 14 Shortest path in graph 1 15 Matrix multiplication 1 16 Travelling salesman problem 1 17 Longest common sequence. 1 18 Back tracking approach 2 18 Backtracking approach 2 19 Solution to Knapsack problem using 1 10 Deranch and bound 1 11 Board PPT	4	Run time analysis of algorithms			PPT
Divide and conquer: Structure of divide and conquer algorithms and recurrence relationship2CO17Recurrence Relationship2Website8Binary Search1Board9Quick Sort1PPT10Straseen Multiplication1Board11Approximate solution (Knapsack problem),1PPT12Singles source shortest paths1Video0Dynamic programming: Overview, programming and divide and conquer1PPT14Shortest path in graph1Flip Learning15Matrix multiplication1Board17Longest common sequence.1Video18Backtracking: Overview, 8-queen problem2Board19Solution to Knapsack problem using Bounding1PPT21FIFO branch and bound1PPT22LC branch and bound application: 0/1 Knapsack problem1PPT23LC branch and bound application:1PPT24Unit 4 Graph Traversal: Overview11PPT24Unit 4 Graph Traversal: Overview11PPT24Cirah Traversal: Overview11Elin Learning	5	Asymptotic Notations	1		PPT
6 and conquer algorithms and recurrence relationship Website 7 Recurrence Relationship 2 8 Binary Search 1 9 Quick Sort 1 10 Straseen Multiplication 1 11 Approximate solution (Knapsack problem), 1 PPT 12 Singles source shortest paths 1 Video Dynamic programming: Overview, 1 1 1 13 difference between dynamic programming and divide and conquer PPT 1 14 Shortest path in graph 1 Board 15 Matrix multiplication 1 Board 16 Travelling salesman problem 1 Board 17 Longest common sequence. 1 Video 18 Back tracking: Overview, 8-queen problem 2 Board 20 Branch and bound: LC searching Bounding 1 PPT 21 FIFO branch and bound 1 PPT 23 LC branch and bound application: 0/1 1 PPT 24 Unit 4 1 PPT		Divide and conquer: Structure of divide	2	CO1	
relationshipWebsite7Recurrence Relationship28Binary Search19Quick Sort110Straseen Multiplication111Approximate solution (Knapsack problem),112Singles source shortest paths113difference between dynamic programming and divide and conquerPPT14Shortest path in graph115Matrix multiplication116Travelling salesman problem117Longest common sequence.119Solution to Knapsack problem using Bounding120Branch and bound121FIFO branch and bound122LC branch and bound application:123LC branch and bound application:124Unit 4124Unit 41	6	and conquer algorithms and recurrence			
7Recurrence Relationship28Binary Search19Quick Sort110Straseen Multiplication111Approximate solution (Knapsack1problem),PPT12Singles source shortest paths113difference between dynamicPPT14Shortest path in graph115Matrix multiplication116Travelling salesman problem117Longest common sequence.118Back tracking: Overview, 8-queen problem219Solution to Knapsack problem using Bounding120Branch and bound: LC searching Bounding121FIFO branch and bound Travelling Salesman Problem122LC branch and bound application:123LC branch and bound application:124Unit 4 Crawbrasel: Overview124Unit 4124Cirayb Traversal: Overview1		relationship			Website
8 Binary Search 1 9 Quick Sort 1 10 Straseen Multiplication 1 10 Straseen Multiplication 1 11 Approximate solution (Knapsack 1 problem), PPT 12 Singles source shortest paths 1 13 difference between dynamic programming: Overview, 1 13 difference between dynamic programming and divide and conquer PPT 14 Shortest path in graph 1 Flip Learning 15 Matrix multiplication 1 Board 16 Travelling salesman problem 1 Board 17 Longest common sequence. 1 Video 18 Back tracking: Overview, 8-queen problem 2 Board 20 Branch and bound: LC searching bounding 1 PPT 21 FIFO branch and bound application: 0/1 1 PPT 23 LC branch and bound application: 1 Traveling Salesman Problem PPT 24 Unit 4 1 1 Elip Learning 24 Unit 4	7	Recurrence Relationship	2		Website
9Quick Sort1PPT10Straseen Multiplication1Board11Approximate solution (Knapsack1PPT12Singles source shortest paths1VideoDynamic programming: Overview,1113difference between dynamicPPT14Shortest path in graph1Flip Learning15Matrix multiplication1Board16Travelling salesman problem1Board17Longest common sequence.1Video18Back tracking: Overview, 8-queen problem2PPT19Solution to Knapsack problem using Backtracking approach1PPT20Branch and bound: LC searching Bounding1PPT21FIFO branch and bound1PPT23LC branch and bound application: Traveling Salesman Problem1PPT24Unit 4 Graph Traversal: Overview1124Corant Fraversal: Overview11	8	Binary Search	1		Board
10Straseen Multiplication1Board11Approximate solution (Knapsack problem),1PPT12Singles source shortest paths1VideoDynamic programming: Overview, afference between dynamic programming and divide and conquer1Video13difference between dynamic programming and divide and conquerPPT14Shortest path in graph1Flip Learning15Matrix multiplication1Board16Travelling salesman problem1Board17Longest common sequence.1Video18Back tracking: Overview, 8-queen problem2PPT19Solution to Knapsack problem using Bounding1CO320Branch and bound: LC searching Bounding1PPT21FIFO branch and bound Traveling Salesman Problem1PPT23LC branch and bound application: Traveling Salesman Problem1PPT24Unit 4 Granh Traversal: Overview1Elin Learning	9	Quick Sort	1		PPT
10Board11Approximate solution (Knapsack problem),112Singles source shortest paths113Dynamic programming: Overview, difference between dynamic programming and divide and conquer113difference between dynamic programming and divide and conquerPPT14Shortest path in graph115Matrix multiplication116Travelling salesman problem117Longest common sequence.118Back tracking: Overview, 8-queen problem219Solution to Knapsack problem using Backtracking approach120Branch and bound: LC searching Bounding121FIFO branch and bound traveling Salesman Problem122LC branch and bound application: 0/1 Traveling Salesman Problem123LC branch and bound application: Traveling Salesman Problem124Unit 4 Granh Traversal: Overview124Granh Traversal: Overview1	10	Straseen Multiplication	1		
11Approximate solution (Knapsack problem),1PPT12Singles source shortest paths1VideoDynamic programming: Overview, difference between dynamic programming and divide and conquer1Video13difference between dynamic programming and divide and conquerPPT14Shortest path in graph1Flip Learning15Matrix multiplication1Board16Travelling salesman problem1Board17Longest common sequence.1VideoUnit 32218Back tracking: Overview, 8-queen problem2Board20Branch and bound: LC searching Bounding1CO320Branch and bound1PPT21FIFO branch and bound application: 0/11PPT23LC branch and bound application: Traveling Salesman Problem1PPT24Unit 4 Graph Traversal: Overview1124Crash Traversal: Overview11	10				Board
11problem),PPT12Singles source shortest paths1VideoDynamic programming: Overview, difference between dynamic programming and divide and conquer1PPT13difference between dynamic programming and divide and conquerPPTPPT14Shortest path in graph1Flip Learning15Matrix multiplication1Board16Travelling salesman problem1Board17Longest common sequence.1VideoUnit 32218Back tracking: Overview, 8-queen problemPPT19Solution to Knapsack problem using Bounding1CO320Branch and bound: LC searching Bounding1PPT21FIFO branch and bound traveling Salesman Problem1PPT23LC branch and bound application: Traveling Salesman Problem1PPT24Unit 4 Graph Traversal: Overview1Flip Learning24Coash Traversal: Overview1Flip Learning		Approximate solution (Knapsack	1		
12Singles source shortest paths1VideoDynamic programming: Overview, difference between dynamic programming and divide and conquer1113difference between dynamic programming and divide and conquerPPT14Shortest path in graph1Flip Learning15Matrix multiplication1Board16Travelling salesman problem1Board17Longest common sequence.1VideoUnit 32218Back tracking: Overview, 8-queen problem219Solution to Knapsack problem using Bounding1CO320Branch and bound: LC searching Bounding1PPT21FIFO branch and bound1PPT22LC branch and bound application: 0/1 Traveling Salesman Problem1PPT23LC branch and bound application:1PPT24Unit 4 Graph Traversal: Overview1Flip Learning24Coash Traversal: Overview1Flip Learning	11	problem),			PPT
Dynamic programming: Overview, difference between dynamic programming and divide and conquer113difference between dynamic programming and divide and conquerPPT14Shortest path in graph1Flip Learning15Matrix multiplication1Board16Travelling salesman problem1Board17Longest common sequence.1VideoUnit 32218Back tracking: Overview, 8-queen problemPPT19Solution to Knapsack problem using Backtracking approach1CO320Branch and bound: LC searching Bounding1PPT21FIFO branch and bound1PPT22LC branch and bound application: 0/1 Traveling Salesman Problem1PPT23LC branch and bound application:1PPT24Unit 4 Graph Traversal: Overview1124Coraph Traversal: Overview11	12	Singles source shortest paths	1		Video
13difference between dynamic programming and divide and conquerPPT14Shortest path in graph1Flip Learning15Matrix multiplication1Board16Travelling salesman problem1Board17Longest common sequence.1VideoUnit 32218Back tracking: Overview, 8-queen problem219Solution to Knapsack problem using Backtracking approach1CO320Branch and bound: LC searching Bounding1PPT21FIFO branch and bound1PPT22LC branch and bound application: 0/1 Traveling Salesman Problem1PPT23LC branch and bound application:1PPT24Unit 41II24Graph Traversal: Overview1Flip Learning		Dynamic programming: Overview,	1		
programming and divide and conquerPPT14Shortest path in graph1Flip Learning15Matrix multiplication1Board16Travelling salesman problem1Board17Longest common sequence.1VideoUnit 32218Back tracking: Overview, 8-queen problemPPT19Solution to Knapsack problem using Backtracking approach1CO320Branch and bound: LC searching Bounding1PPT21FIFO branch and bound1PPT22LC branch and bound application: 0/1 Traveling Salesman Problem1PPT23LC branch and bound application: Traveling Salesman Problem1PPT24Unit 4 Graph Traversal: Overview1Flip Learning	13	difference between dynamic			
14Shortest path in graph1Flip Learning15Matrix multiplication1Board16Travelling salesman problem1Board17Longest common sequence.1VideoUnit 32118Back tracking: Overview, 8-queen problem219Solution to Knapsack problem using Backtracking approach1CO320Branch and bound: LC searching Bounding1PPT21FIFO branch and bound1PPT22LC branch and bound application: 0/11PPT23LC branch and bound application:1PPT24Unit 41FPT24Craph Traversal: Overview1Flip Learning		programming and divide and conquer			PPT
15Matrix multiplication1Board16Travelling salesman problem1Board17Longest common sequence.1Video17Longest common sequence.1Video18Back tracking: Overview, 8-queen problem2PPT19Solution to Knapsack problem using Backtracking approach1CO320Branch and bound: LC searching Bounding1PPT21FIFO branch and bound1PPT22LC branch and bound application: 0/1 Traveling Salesman Problem1PPT23Unit 4 Graph Traversal: Overview1Flip L earning	14	Shortest path in graph	1		Flip Learning
16Travelling salesman problem1Board17Longest common sequence.1Video18Back tracking: Overview, 8-queen problem2PPT19Solution to Knapsack problem using Backtracking approach1CO320Branch and bound: LC searching Bounding1PPT21FIFO branch and bound1PPT22LC branch and bound application: 0/1 Traveling Salesman Problem1PPT24Unit 4 Graph Traversal: Overview1Flip L earning	15	Matrix multiplication	1		Board
17Longest common sequence.1Video18Back tracking: Overview, 8-queen problem2PPT19Solution to Knapsack problem using Backtracking approach1CO320Branch and bound: LC searching Bounding1PPT21FIFO branch and bound1PPT22LC branch and bound application: 0/1 Knapsack problem1PPT23LC branch and bound application: Traveling Salesman Problem1PPT24Unit 41Flip L earning	16	Travelling salesman problem	1		Board
Unit 3 Back tracking: Overview, 8-queen problem219Solution to Knapsack problem using Backtracking approach1CO320Branch and bound: LC searching Bounding1PPT21FIFO branch and bound1PPT22LC branch and bound application: 0/11PPT23LC branch and bound application: Traveling Salesman Problem1PPT24Unit 41PPT	17	Longest common sequence.	1		Video
18Back tracking: Overview, 8-queen problemPPT19Solution to Knapsack problem using Backtracking approach1CO320Branch and bound: LC searching Bounding1PPT21FIFO branch and bound1PPT22LC branch and bound application: 0/1 Knapsack problem1PPT23LC branch and bound application: Traveling Salesman Problem1PPT24Unit 4 Graph Traversal: Overview1Flip L earning		Unit 3	2		
problemPPT19Solution to Knapsack problem using Backtracking approach1CO320Branch and bound: LC searching Bounding1PPT21FIFO branch and bound1PPT22LC branch and bound application: 0/11PPT23LC branch and bound application:1PPT24Unit 41PPT24Graph Traversal: Overview1Flip Learning	18	Back tracking: Overview, 8-queen			
19Solution to Knapsack problem using Backtracking approach1CO320Branch and bound: LC searching Bounding1121FIFO branch and bound1PPT21FIFO branch and bound application: 0/11PPT22LC branch and bound application: 0/11PPT23LC branch and bound application:1PPT24Unit 41PPT		problem			PPT
19Backtracking approachBoard20Branch and bound: LC searching Bounding1PPT21FIFO branch and bound1PPT22LC branch and bound application: 0/1 Knapsack problem1PPT23LC branch and bound application: Traveling Salesman Problem1PPT24Unit 4 Graph Traversal: Overview1Flip L earning	19	Solution to Knapsack problem using	1	CO3	
20Branch and bound: LC searching Bounding121FIFO branch and bound122LC branch and bound application: 0/1123LC branch and bound application: Traveling Salesman Problem124Unit 4 Graph Traversal: Overview1		Backtracking approach			Board
20BoundingPPT21FIFO branch and bound1PPT22LC branch and bound application: 0/11PPT23LC branch and bound application:1PPT24Unit 41PPT24Graph Traversal: Overview1Flip Learning	•	Branch and bound: LC searching	1		
21FIFO branch and bound1PPT22LC branch and bound application: 0/11123LC branch and bound application: Traveling Salesman Problem1PPT24Unit 4 Graph Traversal: Overview1Flip Learning	20	Bounding			PPT
22LC branch and bound application: 0/1123LC branch and bound application: Traveling Salesman Problem124Unit 4 Graph Traversal: Overview1	21	FIFO branch and bound	1		PPT
22Knapsack problemPPT23LC branch and bound application: Traveling Salesman Problem124Unit 4 Graph Traversal: Overview1	22	LC branch and bound application: 0/1	1		
23LC branch and bound application:123Traveling Salesman Problem124Unit 41Craph Traversal: Overview1		Knapsack problem			PPT
23Traveling Salesman ProblemPPT24Unit 41Graph Traversal: Overview1	23	LC branch and bound application:	1		
24Unit 41Craph Traversal: Overview1		Traveling Salesman Problem			РРТ
24 Graph Traversal: Overview Flip Learning		Unit 4	1		
	24	Graph Traversal: Overview			Flip Learning

25	Depth first search	1		Board
26	Breadth first search	1		Board
27	Trees: Review of trees	1	CO4	
	Binary search tree			PPT
28	Traversal, Insertion & Deletion in Binary	1		
	Search Tree			Video
29	B-Trees	2		PPT and
	B+ Trees			Video
30	Basic operations on B Trees.	2		Video
31	Computational Complexity measures	1		PPT
32	Polynomial Vs non-polynomial time	1		
	complexity			PPT
33	NP hard problem with examples	1		PPT
34	NP Complete problem with examples	1		PPT