

DISCRETE MATHEMATICAL STRUCTURES LABORATORY			
Adichunchanagiri University			
(Effective from the Academic Year 2019 -20)			
SEMESTER – III			
Subject Code	18CSL38	CIE Marks	40
Number of Contact Hours/Week	0:2:2	SEE Marks	60
Total Number of Lab Contact Hours	36	Exam Hours	3 Hrs
CREDITS – 2			
Course Learning Objectives: This course will enable students to:			
This laboratory course enable students to get practical experience in design, develop, implement, analyze and evaluation/testing of			
<ul style="list-style-type: none">• Critical thinking of mathematics.• Principles of counting and properties of integers• Properties of relations, functions, Principles of inclusion and exclusion.• Properties of graphs and trees• Understand the usage of Minitab to solve the problems and plot the graph.			
Descriptions (if any):			
Implement Part – A programs in C Programming Language and Linux / Windows as OS.			
Implement Part – B programs using Minitab			
Programs List:			
PART – A			
1.	Write a program to prove the D’Morgan’s Laws.		
2.	Write a program to generate Lucas numbers ($L_n = L_{n-1} + L_{n-2}$; $L_0 = 2$, $L_1 = 1$, $L_n = 2, 1, 3, 4, 7, 11, 18, 29, 47, 76, \dots$).		
3.	6 Boys and 4 Girls got elected as class representatives in a college. A five member student council has to be formed from the elected class representatives. Write a program in how many ways this council can be formed such that i) There are 3 boys and 2 girls ii) At least 2 girls. iii) At least 3 boys.		
4.	Program for the application of Principle of inclusion and exclusion. $ A \cup B \cup C = A + B + C - A \cap B - B \cap C - A \cap C + A \cap B \cap C $		
5.	Write a program to find all the permutations of a given string.		
PART – B			
1.	Use MINITAB to construct a histogram, dot plot, stem-and-leaf plot, and box plot of the following data: {810, 765, 860, 825, 795, 785, 810, 790, 785, 815, 800, 790}		
2.	For the following data sets: i) {43; 46; 54; 51; 45; 49; 42; 52; 50} ii) {810, 765, 860, 825, 795, 785, 810, 790, 785, 815, 800, 790} use pencil and paper or a calculator to find: (a) the median (b) the mean (c) the range (d) the standard deviation Use MINITAB to check your answers.		
3.	Create the data for the three shipping canters like Central, Eastern and Western respectively and determine whether the shipping data follow a normal distribution or not and plot the paneled histogram of the time lapse between order data and delivery date. The columns contain the following information: • Center: shipping center name		

	<ul style="list-style-type: none"> • Order: order date and time • Arrival: delivery date and time • Days: delivery time in days • Status: delivery status <ul style="list-style-type: none"> ✓ On time indicates that the book shipment was received on time. ✓ Back order indicates that the book cannot be shipped yet because it is not currently in stock. ✓ Late indicates that the book shipment was received six or more days after the order was placed. • Distance: distance from the shipping center to the delivery location
4.	Create the scatter plot (groups) of days versus distance by shipping center for the problem 3. Analyse and interpret the results by providing different reports like summary report, diagnostic report, descriptive statistics report and report card.
5.	Determine how many book orders were delivered on time, how many were late, and how many were initially back ordered for each shipping center.
Laboratory Outcomes: The student should be able to:	
<ul style="list-style-type: none"> • Analyze the critical thinking of mathematics. • Apply the principles and properties of counting and integers. • Understand the principles and properties of relations, functions, inclusion and exclusion. • Apply the principles and properties of trees and graphs. • Understand the usage of Minitab to solve the problems and plot the graph. 	
Conduct of Practical Examination:	
<ul style="list-style-type: none"> • Experiment distribution 	
<ul style="list-style-type: none"> • Students are allowed to pick one experiment from part A and one experiment from part B and are given equal opportunity. • Change of experiment is allowed only once and marks allotted for procedure part to be made zero. • Marks Distribution (<i>Subjected to change in accordance with university regulations</i>) <ol style="list-style-type: none"> 1. Part A - Procedure + Execution + Viva = 10 + 35 + 5 = 50 Marks 2. Part B - Procedure + Execution + Viva = 10 + 35 + 5 = 50 Marks 	