



Time:		Max.Marks: 100					
S.NO	Answer All Questions	Choice	Options	Marks	CO	CO BTL	COI BTL
1.	Discuss the importance of Local Maxima and Global Maxima in the context of Modern Optimization techniques.	choice Q-2		10Marks	CO1	3	2
2.	Outline about the loop and Function concept in R programming.			10Marks	CO1	3	3
3.	Answer 3 A and 3 B	choice Q-4		15Marks	CO1	3	3
3.A.	Construct user defined functions for accessing the keyboard and monitor, Reading and writing files using R programming language.			8Marks	CO1	3	2
3.B.	Create function counteven(x) that counts how many Fibonacci numbers are included in a vector x, using below approaches: i. use a for() cycle with an if() condition; ii. use sapply() function; and			7Marks	CO1	3	3
4.	Answer 4 A and 4 B			15Marks	CO1	3	3
4.A.	Discuss in detail about Matrices in R with examples. Write a R program to create two 5x5 matrix and add, subtract, multiply and divide the matrixes.			8Marks	CO1	3	3
4.B.	Using R programming create a dataframe for the following data and then find the details of the student having lowest grade and also find out details of students who joined in CSE Branch. Student_id Student_name Grade Branch 1 Rick A IT 2 Dan X CSE 3 Michelle X IT 4 Ryan B ECE 5 Gary C CSE 6 Rasmi C IT 7 Pranab A ECE 8 Tusar C CSE			7Marks	CO1	3	3
5.	Identify the advantages and disadvantages of Full blind search Algorithm.	choice Q-6		10Marks	CO2	3	1
6.	List the Intialization, Change function, stopping criteria for the Simulated Annealing and Hill Climbing Algorithm.			10Marks	CO2	3	3
7.	Answer 7 A and 7 B	choice Q-8		15Marks	CO2	3	3
7.A.	Identify the key features of Grid Search optimization technique and its variants with algorithm.			8Marks	CO2	3	2
7.B.	Discover the main differences between Hill Climbing and Simulated Annealing Search technique.			7Marks	CO2	3	3
8.	Answer 8 A and 8 B			15Marks	CO2	3	3
8.A.	Using R-Programming, Solve for Bag Prices problem using Monte Carlo Search Optimization technique. $f_{\text{bag prices}} = \sum_{i=1}^D x_i \times \text{sales}(x_i) - \text{cost}(x_i)$			8Marks	CO2	3	3
8.B.	Consider the bag prices (D = 5) task. Adapt the file "bag-grid.R" such that two nested grid searches are performed over the range [350, 450], with a step size of 105 in order to show the solution and evaluation values. $f_{\text{bag prices}} = \sum_{i=1}^D x_i \times \text{sales}(x_i) - \text{cost}(x_i)$			7Marks	CO2	3	3
9.	Justify the need of Mutation and Cross Over Operation in the context of Genetic Algorithms.	choice Q-10		10Marks	CO3	4	1
10.	Outline about the strategies for handling the constraints in the context of Evolutionary algorithms.			10Marks	CO3	4	2
11.	Answer 11 A and 11 B	choice Q-12		15Marks	CO3	4	2
11.A.	Summarize the termination criteria and Mutation technique in the context of Differential evolution algorithm			8Marks	CO3	4	1
11.B.	Estimate the new particle position with the help of velocity in the context of Particle Swarm Optimization.			7Marks	CO3	4	2
12.	Answer 12 A and 12 B			15Marks	CO3	4	4
12.A.	Consider the sphere task in the following equation, Apply Genetic Algorithm to find minimum value as optimization problem. where $x=(x_1, x_2, \dots, x_n)$ is a real valued vector. $f_{\text{sphere}}(\mathbf{x}) = \sum_{i=1}^D x_i^2$			8Marks	CO3	4	3
12.B.	Demonstrate the usage of Particle Swarm optimization Algorithm with example and identify particle velocity and particle position equations.			7Marks	CO3	4	4
13.	Formulate the objective function for Traveling Salesman problem and Identify which optimization is most suited for the above said problem.	choice Q-14		10Marks	CO4	4	1
14.	Justify the need of Support Vectors in the context of Support Vector Machine and identify the parameters required for prediction.			10Marks	CO4	4	2
15.	Answer 15 A and 15 B	choice Q-16		15Marks	CO4	4	2
15.A.	Identify the different Mutation and Cross-Over techniques that can be applied to Travelling Sales Man problem.			8Marks	CO4	4	1
15.B.	Illustrate the process to solve wine quality classification using Support Vector Machine.			7Marks	CO4	4	2
16.	Answer 16 A and 16 B			15Marks	CO4	4	4
16.A.	Illustrate the difference between Weighted Moving Average Model and Exponential model for stock market analysis using example.			8Marks	CO4	4	3
16.B.	Demonstrate Simulated Annealing Optimization technique to solve Traveling Salesman Problem.			7Marks	CO4	4	1

