

Roll No.

Total Pages : 3

016504

December 2023

B.Tech. (CE(DS)) - V SEMESTER

Soft Computing Principles

(PCC-DS-502)

Time : 3 Hours]

[Max. Marks : 75

Instructions :

- 1. It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
- 2. Answer any four questions from Part-B in detail.*
- 3. Different sub-parts of a question are to be attempted adjacent to each other.*

PART-A

- (a) Name the major domains covered under the domain of soft computing. (1.5)
- (b) Why XOR problem cannot be solved using single neuron? (1.5)
- (c) Differentiate between classification and regression. (1.5)
- (d) Name and draw the graph of three commonly used activation functions. (1.5)

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- (e) What is the major drawback of k means clustering? (1.5)
- (f) What is a fuzzy number? (1.5)
- (g) Differentiate between a fuzzy set and classical set. (1.5)
- (h) What is the purpose of crossover in GA. (1.5)
- (i) What is a fitness function in GA? (1.5)
- (j) What is alpha cut in fuzzy set? (1.5)

PART-B

- (a) Differentiate between soft computing and hard computing. (5)
- (b) Describe in detail how a single neuron can be trained as an OR type classifier? (10)
- (a) Describe the architecture of Adaptive Resonance Theory Network with the help of suitable example. (10)
- (b) Write a short note on Self Organizing maps. (5)
- (a) Write a short note on associative memory. (5)
- (b) Explain how a neural network, say multilayer perceptron model, can be trained using back propagation. (10)
- (a) What is the purpose of s-norm? Write various axioms related to s-norm. (5)

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(b) Make and explain the architecture of Fuzzy Control System. (10)

6. (a) Differentiate between k means clustering and fuzzy c means clustering. (5)

(b) Define the following terms in the context of fuzzy set: support, core, height, membership, subnormal fuzzy set. (5)

(c) Describe the basic solution mechanism associated with Genetic Algorithm. (5)

7. (a) Describe how the chromosome for the Travelling Salesman problem is created and evaluated? Also write how the mutation and crossover is performed? (8)

(b) Describe how the chromosome for the Knapsack problem is created and evaluated? Also write how the mutation and crossover is performed? (7)