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**BTECH**  
**(SEM V) THEORY EXAMINATION 2024-25**  
**APPLICATION OF SOFT COMPUTING**

TIME: 3 HRS

M.MARKS: 70

**Note:** Attempt all Sections. In case of any missing data; choose suitably.

## SECTION A

**1. Attempt all questions in brief. 2 x 07 = 14**

Q no.	Question	CO	Level
a.	Define single-layer and multilayer feed-forward networks.	1	K2
b.	What is recurrent neural network architecture?	1	K2
c.	State two factors that affect backpropagation training.	2	K2
d.	Mention one application of backpropagation networks.	2	K2
e.	Write two examples of fuzzy to crisp conversion.	3	K2
f.	Explain the concept of fuzzy implications.	4	K2
g.	List the steps involved in the generational cycle of GA.	5	K2

## SECTION B

**2. Attempt any three of the following: 07 x 3 = 07**

a.	Explain the concept of convergence in the context of the perceptron learning rule.	1	K3
b.	Describe the effect of the learning rule coefficient on the training process in backpropagation networks.	2	K3
c.	Describe the basic concepts of fuzzy logic with an example.	3	K3
d.	Discuss the process of fuzzification and defuzzification with examples.	4	K3
e.	Describe the role of genetic operators in the GA process.	5	K3

## SECTION C

**3. Attempt any one part of the following: 07 x 1 = 07**

a.	Describe in detail the various learning techniques used in neural networks.	1	K4
b.	Explain auto-associative and hetero-associative memory with examples.	1	K4

**4. Attempt any one part of the following: 07 x 1 = 07**

a.	Compare and contrast single-layer and multilayer perceptron models.	2	K4
b.	Explain how backpropagation methods solve the limitations of the perceptron model.	2	K4

**5. Attempt any one part of the following: 07 x 1 = 07**

a.	Explain the role of fuzzy relations in decision-making with examples.	3	K4
b.	Provide a detailed analysis of fuzzy logic's importance in artificial intelligence.	3	K4

**6. Attempt any one part of the following: 07 x 1 = 07**

a.	Describe in detail the algorithms involved in fuzzification and defuzzification.	4	K4
b.	Analyze the role of fuzzy controllers in industrial automation with suitable examples.	4	K4

**7. Attempt any one part of the following: 07 x 1 = 07**

a.	Provide a detailed explanation of the industrial applications of genetic algorithms.	5	K4
b.	Compare genetic algorithms with traditional optimization techniques.	5	K4