Roll No.											

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – December 2025

Date: 11 – 12- 2025 **Time:** 01:00pm – 04:00pm

School: SOE	**Program:** B.Tech	
Course Code: MEC3013	**Course Name:** Soft Computing Techniques	
Semester: VII	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	CO1	CO2	CO3	CO4	CO5	CO6
Marks	10	10	20	20	20	20

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. 10Q x 2M=20M

1.	What is genetic algorithm	2 Marks	L1	CO1
2.	Write De-Morgan's Law	2 Marks	L1	CO1
3.	Difference between Crisp Set and Fuzzy Set	2 Marks	L1	CO1
4.	The algebraic product (A . B) of two fuzzy sets A and B is defined as	2 Marks	L1	CO2
5.	Define an artificial neural network	2 Marks	L1	CO2
6.	The bounded sum of two fuzzy set A and B is defines as	2 Marks	L2	CO2
7.	Write law of associativity in the context of fuzzy set	2 Marks	L2	CO1
8.	Define classical sets and fuzzy sets	2 Marks	L1	CO2
9.	Draw multiple-layer feed-forward network.	2 Marks	L1	CO1
10.	Name and explain two properties of Crisp Set	2 Marks	L1	CO2

Part B

Answer the Questions. **Total Marks 80M**

11.		**Draw a neat Venn diagram of following relations.** (i) **A U B** (ii) **$A \cap B$** (iii) **$A \notin X$** (iv) **$A \supseteq B$** (v) **$A \subseteq B$**	**20 Marks**	**L3**	**CO3**
		Or			
12.		**Consider two given fuzzy sets** $A = \left\{\frac{1}{2} + \frac{0.3}{4} + \frac{0.5}{6} + \frac{0.2}{8}\right\}$ $B = \left\{\frac{0.5}{2} + \frac{0.4}{4} + \frac{0.1}{6} + \frac{1}{8}\right\}$ **Perform union, intersection, difference and complement over fuzzy sets A and B.**	**20 Marks**	**L4**	**CO3**

13.		**Given the two fuzzy sets** $A = \left\{\frac{1}{1.0} + \frac{0.75}{1.5} + \frac{0.3}{2.0} + \frac{0.15}{2.5} + \frac{0}{3.0}\right\}$ $B = \left\{\frac{1}{1.0} + \frac{0.6}{1.5} + \frac{0.2}{2.0} + \frac{0.1}{2.5} + \frac{0}{3.0}\right\}$ **Find the following relations** **(a) A U B** **(b) $A \cap B$** **(c) $\bar{A}$** **(d) $\bar{B}$** **(e) A / B** **(f) $\overline{A \cup B}$** **(g) $\overline{A \cap B}$** **(h) A U $\bar{B}$** **(i) A U $\bar{A}$**	**20 Marks**	**L4**	**CO4**
		Or			
14.	**a.**	**Define Learning. Differentiate between supervised and unsupervised learning**	**10 Marks**	**L3**	**CO4**
	b.	**What is the necessity of activation function? List the commonly used activation function.**	**10 Marks**	**L3**	**CO4**

15.	**Design a Hebb net to implement logical AND function (use bipolar inputs and targets).**	**20 Marks**	**L4**	**CO5**

INPUT			Target
x_1	x_2	b	y
1	1	1	1
1	-1	1	-1
-1	1	1	-1
-1	-1	1	-1

Or					
16.	**a.**	**Name and explain the 10 properties of a Crisp set.**	**10 Marks**	**L3**	**CO5**
	b.	**Explain the proper subset and Complement of a fuzzy set.**	**10 Marks**	**L2**	**CO5**

17.	**Design a Hebb net to implement OR function (consider bipolar inputs)**	**20 Marks**	**L4**	**CO6**

INPUT			Target
x_1	x_2	b	y
1	1	1	1
1	-1	1	1
-1	1	1	1
-1	-1	1	-1

Or					
18.	**a.**	**Explain elitist strategy used in GA.**	**10 Marks**	**L3**	**CO6**
	b.	**Why do we use a high value of crossover probability and a low value of mutation probability in GA-applications ?**	**10 Marks**	**L3**	**CO6**