Roll No.												

PRESIDENCY UNIVERSITY
BENGALURU
SCHOOL OF ENGINEERING

TEST 1 EXAMINATION

Odd Semester: 4th SEM (AY 2021-22)
Course Code: MEC 3013
Course Name: SOFT COMPUTING TECHNIQUES
Program & Sem: B.Tech, & 4th Semester

Date: 27.04.2021
Time: 11:30 AM to 12:30 PM
Max Marks: 30
Weightage: 15%

Instructions:

(i) *Read the question properly and answer accordingly.*
(ii) *Question paper consists of 3 parts.*
(iii) *Scientific and Non-programmable calculators are permitted.*

Part A [Memory Recall Questions]

Answer all the Questions. Each question carries TWO marks. (3Qx2M=6M)

1. Soft Computing is basically an unconventional method of decision making. Can you list few characteristics of Soft Computing which makes it so unconventional?

(C.O.NO.1) [Knowledge]

2. Domain of Soft Computing comprises of various methods and techniques, Can you give any two examples of Soft Computing with a neat block diagram.

(C.O.NO.1) [Knowledge]

3. Every human decision made usually starts from a state of confusion. Define Fuzzy Logic with a small illustration. (C.O.NO.1) [Knowledge]

Part B [Thought Provoking Questions]

Answer both the Questions. Each question carries FOUR marks. (2Qx4M=8M)

4. Soft Computing is a technique which doesn't give an actual precise solution. How would you relate Parking a Vehicle to the domain of Soft Computing. Enumerate your views briefly. (C.O.NO.1) [Comprehension]

5. Fuzzy Sets usually consists of objects with a degree of belongingness to a particular set. How would you represent this membership of a given object? Explain with an illustration. (C.O.NO.1) [Comprehension]

Part C [Problem Solving Questions]

Answer both the Questions. Each question carries SIXTEEN marks.

(2Qx08M=16M)

6. Consider the following two sets such that one set A contains all positive integers below 10 and other set B contains positive even numbers less than 20.

Determine:

(i) Union,

(ii) Intersection,

(iii) Complement of A,

(iv) Set Difference (A-B) and (B-A)

(v) Symmetric Difference.

Draw relevant Venn diagram. (C.O.NO.1) [Application]

7. Consider 5 members of a family Rama, Sita, Dasharatha, Kusha, Lava whose ages are 55, 50, 89, 23, and 24 respectively. Compute the membership value for each family member for a fuzzy set M for all family members who are Senior Citizens.

(C.O.NO.1) [Application]

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TEST 2

Semester : EVEN Semester: 2021 - 22

Course Code: MEC 3013

Course Name: SOFT COMPUTING TECHNIQUES

Program & Sem: B.TECH & 4th

Date: 2nd JUNE 2022

Time: 11.30 AM – 12.30 PM

Max Marks: 30

Weightage: 15 %

Instructions:

(i) Read the all questions carefully and answer accordingly.

(ii) All questions are compulsory

Part A [Memory Recall Questions]

Answer all the Questions. Each Question carries FOUR marks. (3Qx4M=12M)

[KNOWLEDGE LEVEL]

1	Genetic Algorithm is based on Darwin's Theory of evolution. Can you list out and explain four stages of evolution.	[4M] [CO.NO 2]
2	Every physical process can be represented in the form of a mathematical model. Write the general notation and explain briefly types of variables.	[4M] [CO.NO 2]
3	Optimization is making best use of what's available to obtain best results. Can you briefly explain the concept of Maxima and Minima.	[4M] [CO.NO 2]

Part B [Thought Provoking Questions]

Answer all the Questions. Each Question carries SIX marks. (2Qx6M=12M)

[COMPREHENSION LEVEL]

4	Evolution is method by which the world selects the best possible outcome. Can you relate the concept of evolution and develop a mathematical algorithm to explain the evolution. Explain in detail every stage of selection process.	[6M] [CO.NO 2]
5	Nature selects the fittest slowly steadily giving 'n' opportunities to improve and rectify. Nature's selection process highly random. How would you simulate the same process of selection?	[6M] [CO.NO 2]

Part C [Problem Solving Questions]

Answer all the Questions. Each Question carries SIX marks. (1Q x 6M=06M)

[APPLICATION LEVEL]

6	Consider any 10 random customer reviews whose value lies between 1 to 10 and generate a fuzzy set for good ratings using a triangular membership function.	[6M] [CO.NO 1]

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GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY
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SCHOOL OF ENGINEERING

END TERM EXAMINATION

Winter Semester: 4th SEM (AY 2021-22) | **Date**: 4th July 2022

Course Code: MEC 3013 | **Time**: 9:30 AM to 12:30 PM

Course Name: SOFT COMPUTING TECHNIQUES | **Max Marks**: 100

Program & Sem: B.Tech, & IV Semester | **Weightage**: 50%

Instructions:

(i) Read the question properly and answer accordingly.

(ii) Question paper consists of 3 parts.

Part A [Memory Recall Questions]

Answer all the Questions. Each question carries 06 marks. (5Qx6M=30M)

1. Soft Computing deals with something which isn't exact and precise. Can you explain in detail with a block diagram any two examples which operates on soft computing methods? [6M] (C.O.NO.1) [K]

2. Fuzziness in decision making is an inherent core feature of Fuzzy Logic design. This fuzziness is usually handled with the help of membership functions. Can you explain the same with an illustration and sample membership plot? [6M] (C.O.NO.1) [K]

3. Genetic algorithm is a mathematical simulation of Gene and Evolution Theory. Can you explain 4 basic stages of evolution with a biological example? [6M] (C.O.NO.2) [K]

4. Optimization is basically minimizing or maximizing the outcome with what's available. Explain the concept of maxima and minima with a sample plot. Also explain local and global minima and maxima. [6M] (C.O.NO.2) [K]

5. A Perceptron is a basic building block any ANN. Can you explain the basic features of a Perceptron with a neat sketch? Give the mathematical model for a single perceptron running on a step function. [6M] (C.O.NO.3) [K]

Part B [Thought Provoking Questions]

Answer all the Questions. Each question carries 10 marks. (4Qx10M=40M)

6. Fuzzy logic is usually used for sentiment analysis. Mathematical modelling of these usually involves developing a function. Define a fuzzy set of your choice and implement a triangular membership function. [10M] (C.O.NO.1) [C]

7. One of the stage of GA is to slice the parent data and replace the spot with a new piece of data. Consider a binary data of your choice and show the simulation of crossing over mathematically. [10M] (C.O.NO.2) [C]

8. GA is a methodology usually used for TSM, VRP, Stock Market systems. These systems usually run based on repeated iterative cycles. Can you identify and explain the mathematical models used to simulate selection process? [10M] (C.O.NO.2) [C]

9. Modern day image classification algorithms use Deep Learning as a base mathematical model. Draw an ANN and illustrate the Perceptron firing sequence and relevant activation function types. [10M] (C.O.NO.4) [C]

Part C [Problem Solving Questions]

Answer both the Questions. Each question carries 15 marks. (2Qx15M=30M)

10. Chroma is a biggest retailer of electronic goods. The customer reviews on products sold in their outlets are taken seriously and samples of these reviews are usually used for sentiment analysis to obtain an insight on customer satisfaction. 10 sample customer reviews are as listed below. Identify the mathematical method and find what percentage of this data sample points towards an AVERAGE customer satisfaction. The ratings were given on scale of 10. Use 5 and above as marker for GOOD review. Plot your observations. [15M] (C.O.NO.2) [A]

Customer Name	A	B	C	D	E	F	G	H	I	J
RATINGS	2	2	4	6	6	7	5	4	4	5

11. Image classification system developed by Google usually runs on ANN. Simulate an ANN with 1 input, output and hidden layer respectively. Assume any relevant data necessary. Use a step activation function. Run the Network for 4 iterative cycles. [15M] (C.O.NO.5) [A]