

$$B = \{(x_1, 0.5), (x_2, 0.4), (x_3, 0.8), (x_4, 0.3)\}$$

Perform union, intersection, difference and complement operations on fuzzy sets A and B.

7. (a) What is fuzzy inference system ? Explain its various components with the help of diagram.
- (b) What do you understand by fuzzification and defuzzification ? Explain various methods of defuzzification.

Unit-IV

8. What do you mean by image processing ? Explain the fundamental steps in image processing with the help of block diagram. How are Soft Computing techniques used and useful in image processing ? Explain in detail.
9. How soft computing techniques are used and useful in the following areas :
- (i) Information Retrieval System
 - (ii) Robotics and Sensors

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Roll No. :

Total No. of Questions : 9] [Total No of Pages : 4

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MCA 5th Semester (Regular)
 Examination, February-2022
 (CBCS Scheme Current w.e.f. 2018-19)
 Paper-18MCA35C2
SOFT COMPUTING

Time : Three Hours] [Maximum Marks : 80

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note - Attempt five questions in all, selecting one question from each Unit. Q No. 1 is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) What is artificial intelligence ?
- (b) Define classical set with the help of example
- (c) Justify the statement: "Partial membership is allowed in fuzzy set"

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- (d) Differentiate between excitatory and inhibitory connections.
- (e) What is the role of bias in determining the net output of an artificial neural network ?
- (f) Write any four expert systems used in current scenario.
- (g) Discuss the use of soft computing techniques in pattern recognition.
- (h) What are the advantages of using soft computing techniques in drug design ?

Unit-I

- 2. (a) What is soft computing ? How is it different from hard computing ? Discuss various characteristics of soft computing.
- (b) Discuss the analogy between biological and artificial neural network.
- 3. (a) What is genetic algorithm ? Discuss the role of genetic operators in exploring the search space.
- (b) What do you mean by encoding in GA ? Explain different techniques of encoding in GA.

- 4. (a) Define network architecture in ANN. Explain various architectures used in artificial neural networks ?
- (b) What is activation function ? Why is it necessary in artificial neural network ? Explain any four activation functions used in ANN.

Unit-II

- 5. (a) What is feed forward network ? Explain the architecture of Back-propagation network.
- (b) Draw the architecture of Hebb net and explain Hebbian learning rule for training neural networks.

Unit-III

- 6. (a) What is fuzzy membership function ? Explain various features of fuzzy membership function.
- (b) Consider two fuzzy sets A and B given as :

$$A = \{(x_1, 0.8), (x_2, 0.3), (x_3, 0.7), (x_4, 0.9)\}$$
 and