

Con. 9787-13.

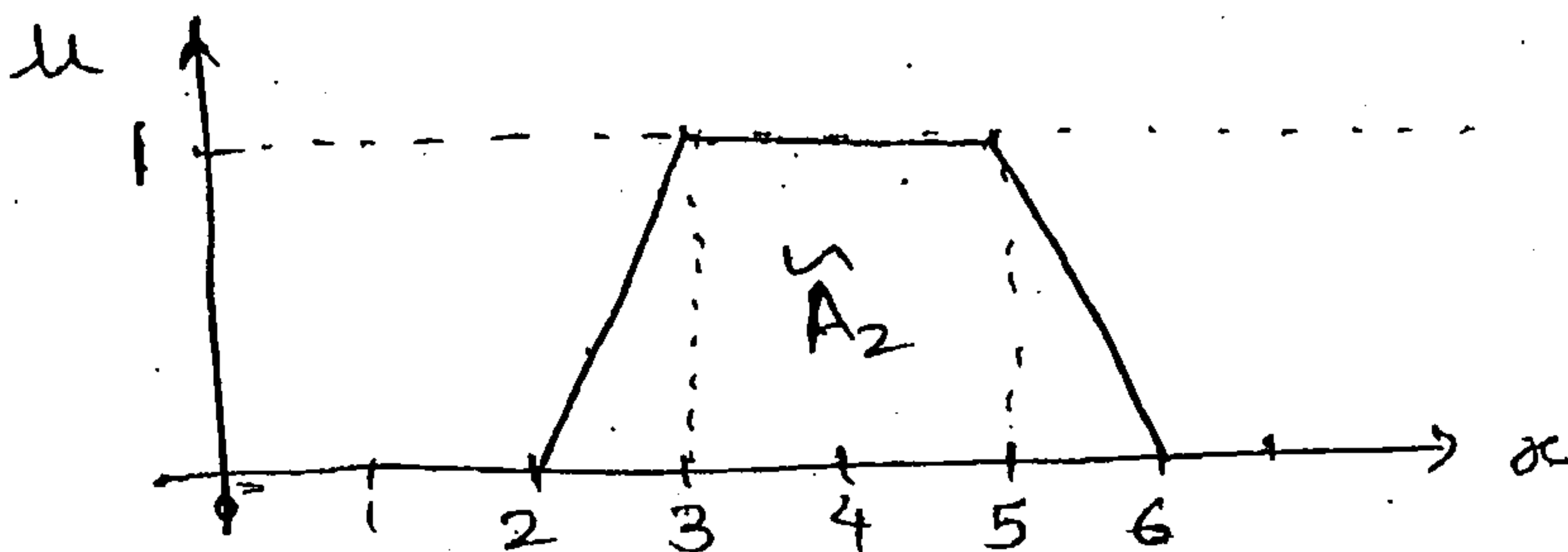
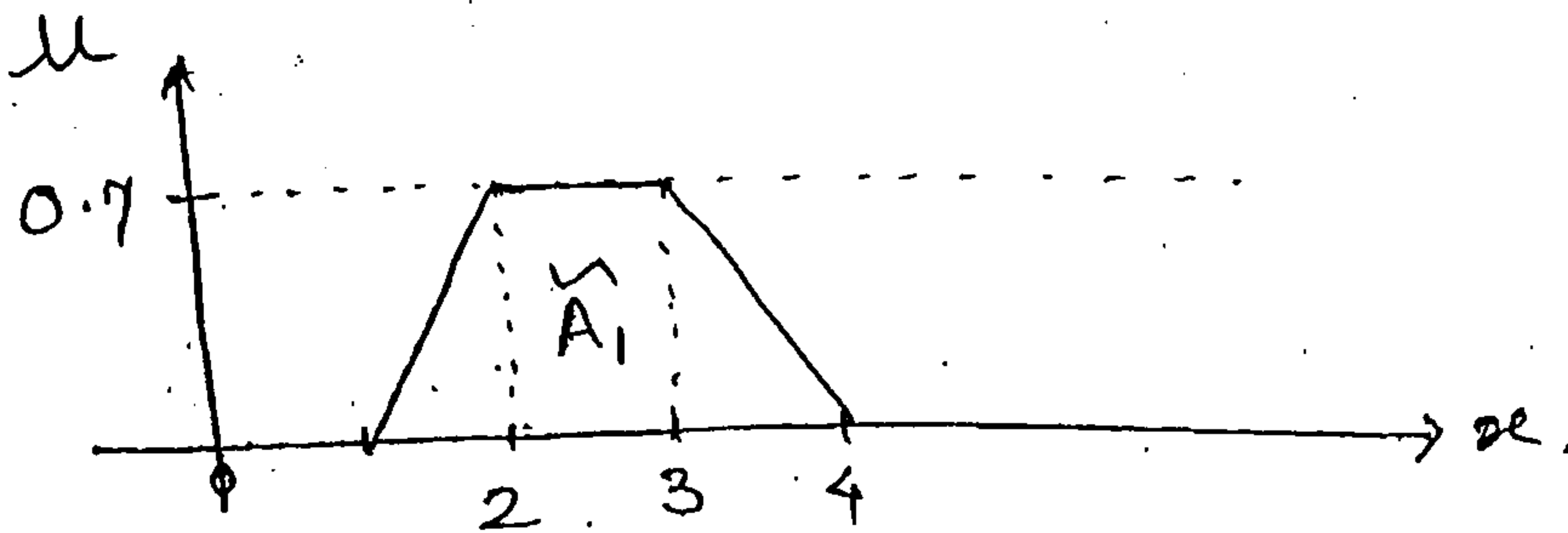
GS-6157

(REVISED COURSE)

(3 Hours)

[Total Marks : 100

- N.B.** (1) Question No.1 is compulsory.
 (2) Attempt any four questions out of the remaining questions.
 (3) Figures to the right indicate full marks.
1. (a) Explain cylindrical extension and projection operations on fuzzy relation with example. 5
 (b) A neuron with 3 inputs has the weight vector $w = [0.1 \ 0.3 \ -0.2]$. The activation function is binary sigmoidal activation function. If input vector is $[0.8 \ 0.6 \ 0.4]$ then find the output of neuron. 5
 (c) What are the various types of Mutation techniques. 5
 (d) Model the following as fuzzy set using trapezoidal membership function. 5
 "Middle age "
 2. (a) What is supervised and unsupervised learning ? Compare different learning rules. 10
 (b) Explain the Radial Basis function neural network for the solution of XOR. 10
 3. (a) Explain Kohonen's self organizing neural network. 10
 (b) For the given membership function as shown in figure below, determine the defuzzified output value by any 2 methods. 10



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4. (a) Explain the operations of genetic programming with help of flowchart. **10**
(b) Compare Mamdani and Sugeno fuzzy models. **10**
5. Design fuzzy logic controller for water purification plant. Assume the grade of water and temperature of water as the inputs and the required amount of purifier as the output. Use three descriptors for input and output variables. Derive set of rules for control the action and defuzzification. The design should be supported by figures. Clearly indicate that if water temperature is low and grade of water is low, then amount of purifier required is large. **20**
6. (a) Explain Travelling salesperson problem using simulated Annealing. **10**
(b) Explain Error back propagation training Algorithm (EBPTA). **10**
7. (a) Write short notes on any two :- **20**
(a) Character recognition using neural network
(b) Learning vector quantization
(c) Derivative based optimization.
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