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| Image result for adamas university logo | **ADAMAS UNIVERSITY**  **END SEMESTER EXAMINATION**  (Academic Session: 2020 – 21) | | |
| **Name of the Program:** | M.Tech | **Semester:** | I |
| **Paper Title:** | Soft Computing | **Paper Code:** | ECS61111 |
| **Maximum Marks:** | 50 | **Time Duration:** | 3 Hrs |
| **Total No. of Questions:** | **17** | **Total No of Pages:** | 2 |
| *(Any other information for the student may be mentioned here)* | 1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam. 2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page. 3. Assumptions made if any, should be stated clearly at the beginning of your answer. | | |

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| **Group A**  **Answer All the Questions (5 x 1 = 5)** | | | |
| 1 | What is soft computing? Give some examples. | **R** | **CO1** |
| 2 | Why there is a need of computing? | **U** | **CO2** |
| 3 | What is cardinality of a fuzzy set? | **R** | **CO3** |
| 4 | What is the classification of learning? | **R** | **CO4** |
| 5 | Who introduced genetic algorithm? | **R** | **CO5** |
| **Group B**  **Answer All the Questions (5 x 2 = 10)** | | | |
| 6 a) | i)Name the model of computing which works on deterministic approach. Explain with the help of example.  ii)Name some applications which works on Soft Computing. | **U** | **CO1** |
| **(OR)** | | | |
| 6 b) | i)Write down the similarities between Artificial Intelligence and Soft Computing.  ii)What is fuzzy relation? Is this concept help in decision making? | **U** | **CO1** |
| 7 a) | Explain any two Soft Computing Methods. | **U** | **CO2** |
| **(OR)** | | | |
| 7 b) | Explain with the help of any real-world application based on household devices which uses soft computing as working principle. | **U** | **CO2** |
| 8 a) | Consider two fuzzy sets given by  A=  Find the fuzzy relation for the Cartesian product of A and B i.e R=A×B | **Ap** | **CO3** |
| **(OR)** | | | |
| 8 b) | Explain defuzzification. | **R** | **CO3** |
| 9 a) | Draw schematic diagram of artificial neuron. | **U** | **CO4** |
| **(OR)** | | | |
| 9 b) | Implement AND function using McCulloch-Pitts neuron.  Consider the truth table  X1 X2 Y  1 1 1  1 0 0  0 1 0  0 0 0 | **Ap** | **CO4** |
| 10 a) | Explain the situation when there is a need of mutation in Genetic Algorithm. | **U** | **CO5** |
| **(OR)** | | | |
| 10 b) | Explain Roulette Wheel concept with the help of example. | **U** | **CO5** |
| **Group C**  **Answer All the Questions (7 x 5 = 35)** | | | |
| 11 a) | i)What is membership function?  ii)What are the three features of membership function? | **U** | **CO1** |
| **(OR)** | | | |
| 11 b) | i)What is crisp set?  ii)Write down some of the operations on Crisp set. | **R** | **CO1** |
| 12 a) | List the basic logic operations performed over propositions. | **R** | **CO2** |
| **(OR)** | | | |
| 12 b) | For the given two fuzzy set  A=  B=  Find the following:   1. A’∩B’ b) A∩B’ c) A U B | **U** | **CO2** |
| 13 a) | Write the steps of back propagation algorithm. | **U** | **CO3** |
| **(OR)** | | | |
| 13 b) | Write the formula which help in updating weights of neurons and describe each component present in the formula. | **R** | **CO3** |
| 14 a) | Explain tournament selection with the help of an example. |  | **CO4** |
| **(OR)** | | | |
| 14 b) | Explain crossover. What are the major types of crossover in genetic algorithms? | **U** | **CO4** |
| 15 a) | What is mutation? After which step mutation is being recognized? |  | **CO4** |
| **(OR)** | | | |
| 15 b) | How genetic algorithm is different from traditional algorithm? | **Ap** | **CO4** |
| 16 a) | Explain Rank based Selection method with the help of an example. | **U** | **CO5** |
| **(OR)** | | | |
| 16 b) | What are evolutionary algorithms? Name some of evolutionary algorithms. | **U** | **CO5** |
| 17 a) | List characteristics of genetic algorithm. | **R** | **CO5** |
| **(OR)** | | | |
| 17 b) | Write a neat flowchart, explain operation of a simple genetic algorithm. | **U** | **CO5** |