JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- MAY-2023

COURSE CODE(CREDITS): 22M11CI211(3)   MAX. MARKS: 25

COURSE NAME: Soft Computing

COURSE INSTRUCTORS: Dr. Simran Setia   MAX. TIME: 1 Hour 30 Minutes

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q1. Draw a perceptron to implement XOR gate. NOTE: You can either draw a multi layer/single layer perceptron.   [5 marks][CO2]

Q2. Calculate the value iteration for all the states in the following Markov Decision Process at discount rate=0.8 using Bellman optimality equation.   [5 marks][CO4]
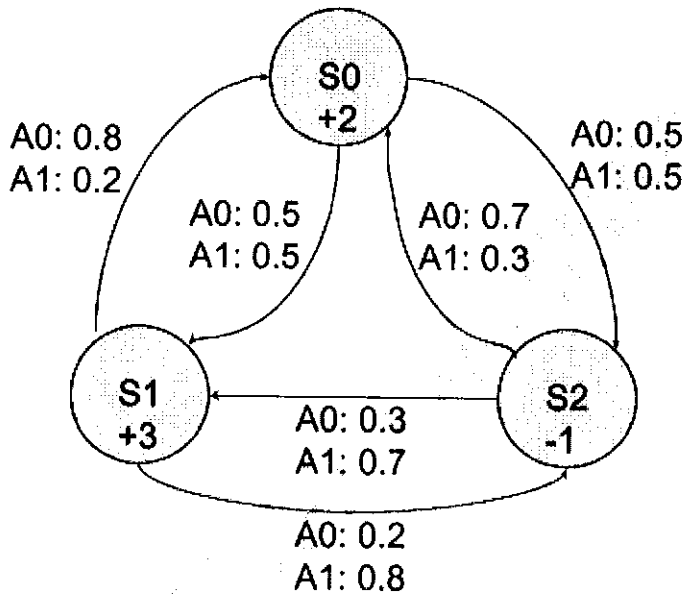
Q3. Answer the following questions in the context of neural networks:

    A. Explain the back propagation algorithm.
    B. What is the difference between Gradient descent and Stochastic Gradient descent optimizer?   [3+2][CO2]

Q4. Answer the following questions:

    A. Explain the Credit Assignment Problem in reinforcement learning.
    B. Explain the difference between reward function and value function in reinforcement learning.   [3+2][CO4]

Q5. Q1. If two fuzzy sets A and B are given with membership functions $\mu_A(x) = \{0.2, 0.4,$ 0.8, 0.5, 0.1\}, $\mu_B(x) = \{0.1, 0.3, 0.6, 0.3, 0.2\}$ and $\mu_c(x) = \{0.5, 0.2, 0.1, 0.3, 0.1\}$ Then calculate the value of membership functions for the following

    a. $A \cap B \cap C$
    b. $A \cup B \cap C$
    c. $\bar{A}$ [2+2+1][CO1]