MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

VII SEMESTER B.TECH. (COMPUTER SCIENCE & ENGINEERING)

END SEMESTER MAKEUP EXAMINATION, Feb/Mar 2022

SUBJECT: OPEN ELECTIVE – PRINCIPLES OF SOFTCOMPUTING [CSE 4305]

REVISED CREDIT SYSTEM

(01/03/2022)

Time: 75 Minutes MAX. MARKS: 20

Instructions to Candidates:

- Missing data may be suitably assumed.

PART B

1A Consider a output neuron J as output neuron. Derive the weight updating rule for this in multilayer perceptron using error back propagation. 5

1B With appropriate equations elaborate on probabilistic activation function. 3

1C Derive the memory matrix used to store m patterns. 2

2A Illustrate the fuzzy inference method using the knowledge of geometry shapes and geometry. 5

2B We want to compare two sensors based upon their detection levels and gain settings. The following table shows sensor detection levels for different gain settings. The item being monitored provides typical membership values to represent the detection levels of each of the sensors. 3

Gain Setting	Sensor S1 detection level	Sensor S2 detection level
0	0	0
20	0.5	0.45
40	0.65	0.6
60	0.85	0.8
80	1	0.95
100	1	1

Form the two fuzzy sets for sensors S1 and S2. Find the following membership functions using standard fuzzy set operations:

(a) $\mu_{s1 \cup s2}(x)$ (b) $\mu_{\overline{s1 \cup s2}}(x)$ (d) $\mu_{\overline{s1 \cap s2}}(x)$

2C What is the drawback of single nearest neighbor classifier? How is it overcome? 2