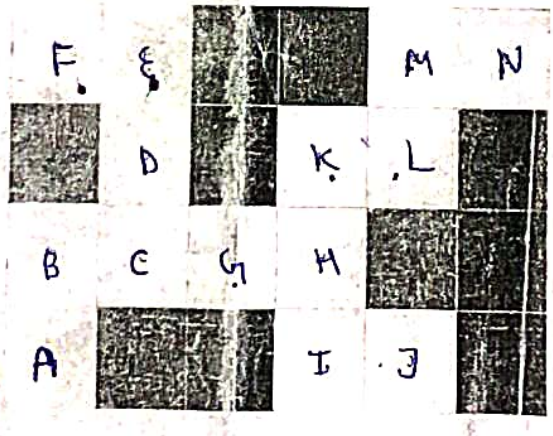
NATIONAL INSTITUTE OF TECHNOLOGY, KURUKSHETRA
MIDTERM-I EXAMINATION

Month and year: **Feb 2025**
Program: **B.Tech.-COE**
Subject: **AI & Soft Computing**
Maximum Marks: **15**

Total no. of pages used: **1**
Semester: **4th**
Course code: **CSPC-204/ITPC-204**
Time allowed: **50 Minutes**

Attempt all the questions

Q-1.	Define soft computing with its key features. Also differentiate between soft computing and hard computing.	3
Q-2.	Given a fuzzy temperature and pressure controller, where temperature (in degree Celsius) is input and pressure (in Millibars) is output. There are 2 fuzzy sets (low_temp, high_temp) for temperature and 2 fuzzy sets for pressure (low_pressure, high_pressure) for pressure. The two fuzzy rules are given as: **Rule1:** If temp is low_temp then pressure is low_pressure **Rule2:** If temp if high_temp then pressure is high_pressure The mebership function of low_temp = max { min{temp/20,1,(120-temp)/40},0} The mebership function of high_temp=max {min{(temp-80)/60,1,(200-temp)/20},0} The mebership function of low_pressure = max { min{pressure/200, 1, (1000-pressure)/200},0} The mebership function of high_pressure = max {min{(pressure-900)/200,1, (2000-pressure)/100},0} Assuming A → B = A×B, if input temperature is 100 degrees Celsius, find output pressure from the controller. Use centroid method for defuzzification.	3
Q-3.	Consider two fuzzy subsets of the set X, X = {a, b, c, d, e} referred to as A and B. A = {1/a, 0.3/b, 0.2/c 0.8/d, 0/e) and B = {0.6/a, 0.9/b, 0.1/c, 0.3/d, 0.2/e} Find: (i) Complement of B. (ii) Bounded Sum of A & B. (iii) Bounded Difference of A & B.	3
Q-4.	What is agent in AI? Explain reflex agent with state.	3
Q-5.	Given a maze where the agent cannot move to the black cell and can only move to non-black cells. Use BFS search to traverse from initial cell A to Goal N. Write in detail how the searching progresses, the sequences of the nodes traversed, and total moves. 	3