POKHARA UNIVERSITY

Level: Bachelor   Semester: Fall   Year   : 2024
Programme: BE   Full Marks : 100
Course: Artificial Intelligence (New)   Pass Marks : 45
                                                        Time   : 3 hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Define Artificial Intelligence? Have you ever used any AI technology like ChatGPT? Do you think that it has intelligence? If yes, explain in detail.   7

   b) Explain the terms- agent, percept, percept sequence, agent function and agent program with example of vacuum-cleaner agent.   8

2. a) How does the A-star search escape from the infinite loop? Explain with suitable example.   8

   b) Explain the concept of Hill-Climbing Search algorithm. What are the common problems associated with it? Explain in detail.   7

   OR

   Formulate and trace the constraint satisfaction procedure for solving the Cryptarithmetic Problem: CROSS + ROADS = DANGER.

3. Consider the following facts:

   i. All creatures that live in forests are beautiful, are magical.

   ii. Unicorns live in Forests

   iii. The creature named Twilight is unicorn

   iv. Twilight is beautiful

   a) Convert the facts in predicate logic.   5

   b) Use resolution to prove "Twilight is magical."   5

   c) Writes those facts in prolog statements.   5

4. a) How does Min-conflicts algorithm work? Explain with the example of 4 queen problem.   7

b) Suppose you are given a problem to test a tissue paper whether it is good or bad. You are given a set of following data: 8

S.N.	X1(Acid Durability)	X2(Strength)	Y (class)
1	7	7	Bad
2	1	4	Good
3	3	5	Good
4	7	4	Bad
5	2	3	Good
6	3	4	Good
7	8	6	Bad

Which method- classification or clustering do you prefer? Use the method you chose to check whether the tissue paper with X1=7 and X2=3 is good or bad.

5. a) What is Perceptron? Explain Perceptron Learning algorithm. 7

OR

Explain how a single layer perceptron learns logical OR operation: assume weights w1=0.3 and w2=-0.2 and bias=0.4 and learning rate α=0.2. (Activation function=Step function)

b) Describe the process of fuzzification and defuzzification with an example. 8

6. a) What is an expert system? Explain how the knowledge required for the expert system is gathered. 8

b) Explain the forward chaining and backward chaining inference mechanism in detail. 7

7. Write short notes on: (**Any two**) 2×5

a) Learning Agent

b) Semantic Net and Frames

c) Alpha-beta pruning