Nirma University

Institute of Technology

Semester End Examination (IR), December - 2021

B. Tech. in Computer Science and Engineering, Semester-VII

2CSDE85 Artificial Intelligence

Roll / Exam No. | Supervisor's Initial with Date

Time: 2 Hours | Max Marks: 50

Instructions:
1. Attempt all the questions.
2. Figures to right indicate full marks.
3. Draw neat sketches wherever necessary.

Q-1 Do as directed **[18]**

a) **CO2** Explain the following terms:- [6]
- i) Operator subgoaling
- ii) Annealing schedule
- iii) Operationalization
- iv) Inferential Efficiency
- v) Graceful Decay of Admissibility
- vi) Ridge

b) **CO2** Draw figures to depict the following situations:- [6]
1) A longer path may be better
2) Interacting sub-goals
3) Unnecessary backward propagation

c) **CO1** Give a detailed classification of production systems. Explain each type of production system along with the suitable examples. [6]

Q-2 Do as directed **[16]**

a) **CO3** Solve the following crypt arithmetic problem step-by-step: [6]
CROSS + ROADS = DANGER

b) **CO3** Convert the following facts into Conjunctive Normal Form (CNF), and resolve the answer to the question: Is Tomy alive? [6]

Facts:-
1) Tomy was an animal.
2) Tomy was a dog.
3) Tomy was born in 40 A.D.
4) All dogs died when volcano erupted in 70 A.D.
5) No mortal lives longer than 150 years.
6) It is now 2021.
7) Alive means not dead.
8) If someone dies then it is dead at all later times.

c) **CO4** For the given instance object O, how can we retrieve a value V for an attribute A? List out all the necessary steps. [4]

Q-3 Do as directed **[16]**

a) CO4 Write a program in PROLOG to split the input list of numbers IN_LIST into two output lists: POS and NEG, which contains positive numbers and negative numbers respectively. [3]

b) CO4 What is Dempster Shafer Theory? Apply the theory to the real-life example and justify its usefulness. [6]

OR

b) CO4 Explain in detail: Certainty Factors And Rule-Base Systems. [6]

c) CO3 Write the algorithm of "Simulated Annealing". What is the effect of "Annealing schedule" on this search process? [7]

OR

c) CO3 Write the steps involved in A* search algorithm. Take a suitable example to demonstrate its working. [7]