Roll No. ..... Total Pages : 3

BT-4/M-22 **44228**

INTELLIGENT SYSTEMS

Paper–PC-CS-AIML-204A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *five* questions in all, selecting at least *one* question from each unit.

UNIT–I

1. (a) What are NP problems? What are NP-complete problems? Why do we categorize AI problems in NP?

(b) Differentiate between propositional and symbolic logic. Define the terms tautology and satisfiability with example for each. (8, 7)

2. (a) What do you mean by knowledge base? Explain the processes involved in knowledge engineering.

(b) What is the use of symbolic logic? Give two example notations and explain how AI approaches will be benefitted by symbolic and sub-symbolic logic? (6, 9)

UNIT–II

3. (a) What is hill climbing problem? Describe it. Why is it categorized as an optimization problem? What kind of problems can it solve?

   (b) What is the paradigm behind ant colony. Is ant colony optimization a swarm intelligence technique? Describe probability decision rule and pheromone trail updation rule in ACO. (8, 7)

4. (a) Why do we say that PCA is dimensionality reduction technique? Describe the need for covariance matrix computation and eigenvector computation here.

   (b) Illustrate parameters of Gaussian mixture functions. Describe in detail the expectation- maximization method used in GMM. (7, 8)

UNIT–III

5. (a) What characteristics do intelligent system possess? What are rule based systems?

   (b) Why do we apply conflict resolution strategies? Discuss two such methods. (9, 6)

6. (a) What are the features of forward chaining and backward chaining as applied to intelligent systems.

   (b) Explain challenges and phases involved in knowledge acquisition. (9, 6)

UNIT–IV

7. (a) Explain the importance of membership functions in fuzzy systems. Give different fuzzy set operations.

   (b) What are expert systems? What are decision support systems? Explain how AI will be applied in these systems. (7, 8)

8. (a) Why natural language processing is an AI application area? What different technologies are used in NLP?

   (b) How semantic web works? Discuss different available technologies. (7, 8)