

(Time: 2½ hours)

[Total Marks: 60]

- N. B.: (1) All questions are compulsory.
(2) Make suitable assumptions wherever necessary and state the assumptions made.
(3) Answers to the same question must be written together.
(4) Numbers to the right indicate marks.
(5) Draw neat labeled diagrams wherever necessary.
(6) Use of Non-programmable calculator is allowed.

1. **Attempt any two of the following:** 12
a. Explain the foundation of Artificial Intelligence with respect to the following areas:
i) Mathematics ii) Neuroscience iii) Control Theory
b. Describe the architecture of an Expert System.
c. Write a short note on Blackboard Systems.
d. What is Truth Maintenance System? Explain Monotonic and Non Monotonic Truth Maintenance Systems.
2. **Attempt any two of the following:** 12
a. Write a short note on
i) Joint Probability ii) Conditional Probability
b. What is Bayes' Theorem? Derive Bayes' Theorem from Conditional Probability.
c. Describe the Basic Reshaping Operations on Fuzzy Sets with an example.
d. List any six types of Membership Functions of Fuzzy Sets.
3. **Attempt any two of the following:** 12
a. Explain the components of Machine Learning Systems.
b. Write a short note on Support Vector Machines.
c. Describe the components of Artificial Neural Network.
d. Explain the architecture of Single Layer Feed-Forward Networks.
4. **Attempt any two of the following:** 12
a. Describe the different Encoding schemes used on chromosomes in Genetic Algorithm.
b. Write a short note on Swarm Intelligence.
c. Explain the classification of Intelligent Agents.
d. List the different architecture types of Intelligent Agent. Explain Layered Architecture of an agent in detail.
5. **Attempt any two of the following:** 12
a. List all the Conceptual Primitive actions with an example.
b. Describe the components of Script Structure? Give the script for event - Going Theater to see the play.
c. What are the different phases of Sentence Analysis?
d. Explain the Link and Chart types of parsers for parsing sentences.