

**Note:** Attempt all Sections. If require any missing data; then choose suitably.

**SECTION A**

**1. Attempt *all* questions in brief.**

**2 x 10 = 20**

- a) What is an intelligent agent?
- b) State any two foundation areas of artificial intelligence.
- c) Compare uninformed and informed search methods.
- d) Briefly explain the concept of adversarial search.
- e) Differentiate between procedural and declarative knowledge.
- f) What do you mean by the knowledge representation?
- g) Define the term machine learning.
- h) Write a short note on reinforcement learning.
- i) Define the term pattern with example.
- j) State nearest neighbour rule.

**SECTION B**

**2. Attempt any three of the following:**

**10 x 3 = 10**

- a) Discuss various categories of artificial intelligence tasks.
- b) Explain Best-first search algorithm with the help of a diagram.
- c) Discuss and compare forward and backward chaining methods with example.
- d) What do you mean by statistical learning? Explain Naïve Bayes model.
- e) Define the term clustering. Discuss k-means clustering algorithm.

**SECTION C**

**3. Attempt any *one* part of the following:**

**10 x 1 = 10**

- a) diagram Discuss functioning of model based intelligent agent with the help of a
- b) Explain various steps involved in natural language processing.

**4. Attempt any *one* part of the following:**

**10 x 1 = 10**

- a) Explain AND-OR graph searching algorithm.
- b) Discuss the concept of MIN MAX search algorithm with diagram.

**5. Attempt any *one* part of the following:**

**10 x 1 = 10**

- a) Explain concept and use of clause form conversion algorithm.
- b) What is Bayesian network? Explain steps to create a Bayesian network.

**6. Attempt any *one* part of the following:**

**10 x 1 = 10**

- a) What do you mean by Maximum Likelihood estimation? Also explain Expectation Maximization algorithm.
- b) Discuss steps and algorithm to construct a decision tree.

**7. Attempt any *one* part of the following:**

**10 x 1 = 10**

- a) Explain design cycle of a pattern recognition system with diagram.

- b) Explain need and concept of principle component analysis in pattern recognition process.