Program/Sem:	T.Y. B.Sc. CS – Sem - V	**Course:**	**Artificial Intelligence**
Program Code:	1S00195	**Course Code:**	**USCS501**

Duration: 2 ½ Hour 0 3 NOV 2025 **Max. Marks:** 75

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Draw neat diagrams wherever necessary.

Q. 1 Attempt ANY FOUR from the following: **[20]**

a) Differentiate between Narrow AI, General AI, and Superintelligent AI.

b) Explain the contribution of philosophy to AI.

c) Discuss four real-world applications of AI in different domains.

d) What are the four major approaches to AI as per Russell & Norvig?

e) Describe the PEAS framework with a suitable example.

f) Explain the structure of intelligent agents with the help of examples.

Q. 2 Attempt ANY FOUR from the following: **[20]**

a) Explain why Knowledge Representation (KR) is important in AI systems.

b) Differentiate between Declarative knowledge and Procedural knowledge with examples.

c) Explain Semantic Networks with a suitable example.

d) Describe Frames in knowledge representation with an example.

e) Apply Modus Ponens to prove "Socrates is mortal."

f) Apply Production Rules in a medical diagnosis example.

Q. 3 Attempt ANY FOUR from the following: **[20]**

a) Explain Bayesian Networks with a suitable example.

b) What is the Naïve Bayes classifier? Explain its advantages and limitations.

c) Describe the working of the Expectation-Maximization (EM) algorithm.

d) Define Unsupervised Learning and give two real-world applications.

e) Apply Hidden Markov Models (HMMs) in speech recognition.

f) Apply Association Rule Mining to supermarket analysis with milk and bread.

Q. 4 Attempt ANY FIVE from the following: **[15]**

a) Distinguish between Simple Reflex Agents and Model-based Reflex Agents.

b) Differentiate between Decision Tree, SVM, Boosting, and KNN.

c) Use Q-learning to explain how an agent learns in a grid-world environment.

d) Compare Goal-based Agents and Utility-based Agents.

e) Compare Propositional Logic and First-Order Logic.

f) Differentiate between K-means clustering and Hierarchical clustering.

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