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Question Paper Code : 50055

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

Sixth Semester

Artificial Intelligence and Data Science

AD 8601 – ARTIFICIAL INTELLIGENCE II

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the four primary sources of uncertainty.
2. Mention the need for probabilistic reasoning in AI.
3. Represent the various applications of HMM.
4. List the variables involved in the Kalman filter.
5. What is meant by Utility Theory?
6. Distinguish between non-cooperative game theory and cooperative game theory.
7. Difference Between Discriminative and Generative Models.
8. What is an EM algorithm?
9. List the two significant functionalities of Reinforcement learning.
10. What is Planning in AI?

PART B — (5 × 13 = 65 marks)

11. (a) Explicate the Bayesian networks with a suitable sketch.

Or

- (b) Discuss in detail the various probabilistic reasoning with suitable mathematical notations.

12. (a) Elucidate the Dynamic Bayesian Networks (DBN) with a suitable sketch. Also, compare the DBN with HMM.

Or

- (b) Discuss in detail about HMM model in AI with a neat diagram.

13. (a) Mention Multiagent environments in AI. Also, brief the same with suitable examples.

Or

- (b) Mention the MDPs with suitable sketch and mathematical notation.

14. (a) With suitable example, analyse the Bayesian Linear Regression? and explain the pro's and con's with neat sketch.

Or

- (b) Explain Gaussian mixture models with suitable mathematical notations.

15. (a) Discuss in detail passive reinforcement learning. Also, mention the various approaches involved in both known and unknown environments of the same.

Or

- (b) How the Inverse Reinforcement Learning (IRL) differ from regular reinforcement learning? Also, brief the IRL with suitable mathematical notation.

PART C — (1 × 15 = 15 marks)

16. (a) What is meant by Clustering? List the Clustering Methods and its steps involved with suitable numerical examples.

Or

- (b) How reinforcement learning aids in Robotic frameworks. Consider one of the real-time problems and discuss it with a suitable sketch, how this model will follow the ethics and safety.