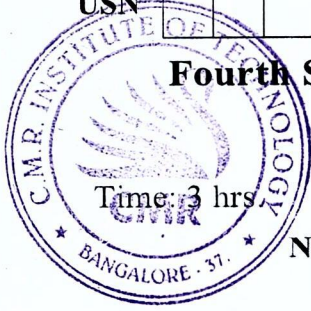


CBCS SCHEME

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Fourth Semester MBA Degree Examination, Dec.2025/Jan.2026 Machine Learning

Max. Marks: 100

- Note:** 1. Answer any **FOUR** full questions from Q.No.1 to Q.No.7.
 2. Question No. 8 is compulsory.
 3. M : Marks , L: Bloom's level , C: Course outcomes.

| | | | M | L | C |
|-----|----|---|----|----|-----|
| Q.1 | a. | Define Machine Learning and illustrate your answer with a suitable example. | 03 | L2 | CO1 |
| | b. | Explain the computer hardware components and architecture required to support Machine Learning applications. | 07 | L2 | CO1 |
| | c. | Discuss the major programming languages used in machine learning and describe their specific roles or advantages. | 10 | L2 | CO1 |
| Q.2 | a. | What is supervised and unsupervised in machine learning? | 03 | L2 | CO1 |
| | b. | Discuss any two Regression models used in machine learning. | 07 | L2 | CO1 |
| | c. | Discuss classification models used in machine learning. | 10 | L2 | CO1 |
| Q.3 | a. | What is decision tree? Write with an example. | 03 | L5 | CO4 |
| | b. | Discuss entropy with an example. | 07 | L5 | CO4 |
| | c. | Explain ID3 algorithm with an example. | 10 | L5 | CO5 |
| Q.4 | a. | What is an Ensemble model? Write with an example. | 03 | L3 | CO2 |
| | b. | Discuss bagging and boosting with an example. | 07 | L3 | CO2 |
| | c. | Discuss stacking with an illustration. | 10 | L3 | CO2 |
| Q.5 | a. | Explain Reinforcement learning. | 03 | L4 | CO3 |
| | b. | Discuss Q – learning by illustration. | 07 | L4 | CO3 |
| | c. | Discuss Reinforcement learning relation to Dynamic programming and active Reinforcement learning. | 10 | L4 | CO3 |
| Q.6 | a. | What is a virtual reality? | 03 | L1 | CO1 |
| | b. | Elaborate the importance of flight simulation. | 07 | L1 | CO1 |
| | c. | Discuss virtual environment requirement. | 10 | L1 | CO1 |

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| Q.7 | a. | What is Augmented Reality? | 03 | L1 | CO1 |
| | b. | Explain motivation and sampling theory in Reinforcement learning. | 07 | L1 | CO1 |
| | c. | Discuss visualization Techniques for augmented reality. | 10 | L1 | CO1 |
| Q.8 | | <p>Case Study :</p> <p>A large urban supermarket chain wants to improve customer experience increase sales and optimize operations. The store uses loyalty cards, billing systems, CCTV, mobile apps, Shelf sensors and employee management systems. The Management is exploring modern AI techniques and immersive technologies to solve common problems such as predicting customer behaviour optimizing pricing, improving restocking efficiency, guiding shoppers and training employees.</p> <p>Customers walk through the store picking products. Staff restocks shelves throughout the day, and managers analyse sales data to take decisions about pricing, inventory and promotions. The super market is looking for intelligent solutions to reduce stock outs, improve customer satisfaction and boost profitability.</p> | | | |
| | a. | <p>Decision tree algorithms.</p> <p>Explain how decision tree algorithms can be applied in a supermarket scenario. Provide three specific use cases where Decision Trees help in decision making or production within the store environment.</p> | 05 | L5 | CO4 |
| | b. | <p>Reinforcement learning.</p> <p>Describe how Reinforcement learning can be used in a supermarket setting mention three applications where RL can improve store operations, customer services or automation.</p> | 05 | L5 | CO4 |
| | c. | <p>Augmented Reality (AR) Virtual Reality (VR)</p> <p>Discuss the role of Augmented Reality (AR) and Virtual reality in enhancing supermarket operations and customer experience.</p> | 05 | L5 | CO4 |
| | d. | How AR and VR could be implemented on a modern supermarket? | 05 | L1 | CO1 |
