



Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S8 (R,S) Examinations April 2026 (2019 Scheme)

Course Code: RAT402
Course Name: AI AND MACHINE LEARNING

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

Marks

- | | | |
|----|--|-----|
| 1 | Explain the concept of Artificial Intelligence. | (3) |
| 2 | Draw the block diagram of an Expert System. | (3) |
| 3 | Mention three unsupervised learning algorithms. | (3) |
| 4 | Which are the basic elements of reinforcement learning. | (3) |
| 5 | List any three industrial applications of convolutional neural networks. | (3) |
| 6 | Explain the role of activation function in a neural network. | (3) |
| 7 | What are the challenges in image detection. | (3) |
| 8 | Give three applications of machine vision. | (3) |
| 9 | List the application of robots in health care. | (3) |
| 10 | Sketch the block diagram of robotic perception process. | (3) |

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

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|----|---|-----|
| 11 | a) Discuss in detail the Turing test with necessary diagrams. | (8) |
| | b) What is the role of Deep Learning in speech processing. | (6) |

OR

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|----|--|-----|
| 12 | a) What is deep learning and how is it different from traditional Machine Learning. | (6) |
| | b) Explain in detail how artificial intelligence can be applied in providing vision to robots. | (8) |

Module II

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|----|--|-----|
| 13 | a) With neat sketches explain supervised and unsupervised learning. | (8) |
| | b) Explain how stochastic gradient descent differs from the gradient descent with the help of neat diagrams. | (6) |

OR

- 14 a) With neat figures, explain how the decision tree algorithm can be modified to form the random forest algorithm. (10)
b) Define the role of hyperplane related to SVM. (4)

Module III

- 15 a) Explain the multilayer feed forward network with a neat sketch. (7)
b) With a neat diagram, explain RNN architecture related to AI. (7)

OR

- 16 a) Draw a neat block diagram and explain the process of computer vision. (10)
b) What is optical character recognition (OCR). (4)

Module IV

- 17 a) Which are the different stages in texture analysis. (6)
b) What is meant by image acquisition. Which are the main components in acquisition. (8)

OR

- 18 a) How can computer vision be utilized for effective traffic sign detection. (7)
b) Explain the application of AI in crop monitoring. (7)

Module V

- 19 Explain Machine learning in robot perception with a neat block diagram. (14)

OR

- 20 a) Explain the Markov localization. (8)
b) Differentiate between effectors and actuators. (6)
