

**THE KAVERY ENGINEERING COLLEGE***(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL/MAY 2026***Fourth Semester**Computer Science and Engineering***UCSTL24401 / CS3491 – Artificial Intelligence and Machine Learning***(Common to Fourth Semester Information Technology &**(Sixth Semester Biomedical Engineering, Electronics and Communication Engineering)**Regulations – 2024 & 2021**Duration : 3 Hrs**Maximum : 100 Marks***PART – A (ANSWER ALL QUESTIONS) (Marks 10\*2=20)**

| <i>Q.No</i> | <i>Questions</i>                                                                                    | <i>BLT</i> | <i>CO</i> | <i>Marks</i> |
|-------------|-----------------------------------------------------------------------------------------------------|------------|-----------|--------------|
| 1.          | Mention any four expert tasks where AI plays its role.                                              | L2         | 1         | 2            |
| 2.          | List down the characteristics of Intelligent agent.                                                 | L1         | 1         | 2            |
| 3.          | Give any two applications of naïve Bayes classifier algorithm.                                      | L2         | 2         | 2            |
| 4.          | Compare LDA and Independent component analysis techniques with respect to dimensionality reduction. | L2         | 2         | 2            |
| 5.          | How do we extract a rule from a decision tree?                                                      | L2         | 3         | 2            |
| 6.          | State Bayes Rule.                                                                                   | L1         | 3         | 2            |
| 7.          | List any three issues while applying the K Nearest neighbor algorithm.                              | L2         | 4         | 2            |
| 8.          | List the advantages of bagging over boosting.                                                       | L2         | 4         | 2            |
| 9.          | What is the learning rate in perceptron model?                                                      | L1         | 5         | 2            |
| 10.         | Why is back propagation necessary in neural networks?                                               | L2         | 5         | 2            |

**PART – B (ANSWER ALL QUESTIONS) (Marks 5\*16 = 80)**

| <i>Q.No</i> | <i>Questions</i>                                                                            | <i>BLT</i> | <i>CO</i> | <i>Marks</i> |
|-------------|---------------------------------------------------------------------------------------------|------------|-----------|--------------|
| 11.         | a i Explain in detail the structure of different intelligent agents.                        | L2         | 1         | 8            |
|             | ii Explain the performance of problem-solving method based on depth first search algorithm. | L2         | 1         | 8            |
|             | Or                                                                                          |            |           |              |
|             | b i Explain How does a problem-solving agent work.                                          | L2         | 1         | 8            |
|             | ii Explain A* search algorithm and its properties.                                          | L2         | 1         | 8            |
| 12.         | a i Describe the applicability of the Bayesian model selection strategy.                    | L2         | 2         | 8            |
|             | ii Describe the apriori algorithm to find frequent item sets using Bayesian rule.           | L2         | 2         | 8            |
|             | Or                                                                                          |            |           |              |
|             | b i Discuss about Bayes estimator.                                                          | L2         | 2         | 8            |
|             | ii Describe approximate inference explain with suitable example.                            | L2         | 2         | 8            |

13. a Discuss about multivariate regression in machine learning domain with suitable example. L2 3 16

Or

b Describe support vector machine and decision tree with suitable example. L2 3 16

14. a i Is k-nearest neighborhood estimation used as distance-based classification? -Justify the answer. L4 4 8

ii Compare k-nearest neighbor method with the condensed nearest neighbor method for classification. L4 4 8

Or

b The table below has information about 10 wines sold in the market along with their alcohol and alkalinity of ash content. Use k-means clustering algorithm to get the clusters. L4 4 16

| Wine              | 1    | 2     | 3    | 4  | 5    | 6    | 7    | 8    | 9     | 10   |
|-------------------|------|-------|------|----|------|------|------|------|-------|------|
| Alcohol content   | 14.8 | 11.05 | 12.2 | 12 | 14.5 | 11.2 | 11.5 | 12.8 | 14.75 | 10.5 |
| Alkalinity of ash | 28   | 12    | 21   | 20 | 29   | 13   | 12   | 19   | 28    | 14   |

15. a i Explain the structure of Neural network using suitable diagram. L2 5 8

ii Explain the role of backpropagation in a multilayer Neural Network. L2 5 8

Or

b i Explain the following terms related to neural networks: i) neuron ii) loss function iii) accuracy iv) cost function v) regularization. L2 5 10

ii Explain how neural network can be applied for face recognition. L2 5 6