



Date: 02-05-2025

Dept. No.

Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

SECTION A – K1 (CO1)**Answer ALL the questions****(5 x 1 = 5)****1 MCQ: Choose the best answer:**

- a) Regression methods and Classification methods come under
(i) Unsupervised Learning (ii) Supervised Learning
(iii) Supervised and Unsupervised Learning (iv) None of these
- b) A Linear Regression equation shall involve ----- number of independent variables.
(i) 1 (ii) 2
(iii) 3 (iv) n, where n is a positive integer
- c) SVM kernel trick is used when the data points are
(i) linearly separable (ii) not linearly separable
(iii) close to one another (iv) None of these
- d) Clustering algorithms
(i) determine compact representation of data (ii) identify distinct groups of data
(iii) determine the association rules (iv) predict the values of features
- e) Lift for the association rule $X \rightarrow Y$ is used to indicate the ----- of association between X and Y.
(i) prevalence (ii) intensity
(iii) confidence (iv) None of these

SECTION A – K2 (CO1)**Answer ALL the questions****(5 x 1 = 5)****2 Define each term.**

- a) Independent variable
- b) Polynomial Regression
- c) Confusion Matrix
- d) Principal Components
- e) Association Rule

SECTION B – K3 (CO2)**Answer any THREE of the following****(3 x 10 = 30)**

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|---|---|
| 3 | Briefly discuss any four tools for Machine Learning. |
| 4 | What is meant by Multiple Regression method? Give a programming example. |
| 5 | Illustrate margin, support vectors and kernel trick in the context of SVM method. |
| 6 | Discuss the collaborative Filtering method. Give an example. |
| 7 | Briefly explain the terms Agent, Actions, State, Reward, and Policy. |

SECTION C – K4 (CO3)**Answer any TWO of the following****(2 x 12.5 = 25)**

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| 8 | Differentiate between Overfitting and Underfitting problems. |
| 9 | Discuss the Bagging and Boosting methods. |
| 10 | Illustrate K-Means Clustering method with an example. |
| 11 | Explain FP-Growth algorithm with an example. |

SECTION D – K5 (CO4)**Answer any ONE of the following****(1 x 15 = 15)**

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| 12 | Discuss Decision Tree Classification and Decision Tree Regression with examples. |
| 13 | How can we use Bellman's equation to obtain optimum plan in a maze problem? |

SECTION E – K6 (CO5)**Answer any ONE of the following****(1 x 20 = 20)**

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| 14 | (a) What is meant by Unsupervised Learning approach? Give an example. | (10 marks) |
| | (b) Compare Ridge Regression and Lasso Regression methods. | (10 marks) |
| 15 | (a) Discuss Logistic Regression Classification method with a programming example. | (10 marks) |
| | (b) Explain Principal Component Analysis method with an example. | (10 marks) |
