

**BACHELOR OF TECHNOLOGY (CBCS - 2023)**  
**B. Tech. Sem-V INFORMATION TECHNOLOGY : WINTER: 2025**  
**SUBJECT: ARTIFICIAL INTELLIGENCE & MACHINE LEARNING**

Day : Wednesday  
Date : 10/12/2025

**W-30778-2025**

Time : 02:30 PM-05:30 PM  
Max. Marks : 60

NB :

1. All questions are COMPULSORY.
2. Figures to the right indicate FULL Marks.
3. Draw neat and labelled diagrams WHEREVER necessary.

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|-----------|---|--------------|
| Q. 1      | Using the Gradient Descent algorithm, illustrate how model parameters are updated during the process of minimizing a cost function.       | CO1 BT2 (10) |
| <b>OR</b> |   |              |
| Q. 1      | Describe the characteristics of a Normal Distribution and explain why it is widely used in ML model assumptions.                          | CO1 BT1 (10) |
| Q. 2      | Apply the concept of feature extraction to a real-world example and explain how it improves the efficiency of ML algorithms.              | CO2 BT3 (10) |
| <b>OR</b> |   |              |
| Q. 2      | Demonstrate, with an example, how feature extraction reduces redundancy while retaining essential information.                            | CO2 BT1 (10) |
| Q. 3      | Analyze the decision boundary characteristics of Logistic Regression and discuss how sigmoid activation impacts classification.           | CO3 BT4 (10) |
| <b>OR</b> |   |              |
| Q. 3      | Explain Amazon Bedrock and describe how it provides access to multiple foundation models for enterprise use.                              | CO3 BT2 (10) |
| Q. 4      | Apply Linear Regression to a small sample dataset and interpret the meaning of regression coefficients.                                   | CO4 BT3 (10) |
| <b>OR</b> |   |              |
| Q. 4      | Using an example, demonstrate how the residuals of a Linear Regression model help evaluate its performance.                               | CO4 BT3 (10) |
| Q. 5      | Analyze how models like BERT and LaMDA differ in their pretraining objectives and evaluate how this affects conversational understanding. | CO5 BT4 (10) |
| <b>OR</b> |   |              |
| Q. 5      | Discuss how Amazon Bedrock simplifies model deployment and integration in cloud-based applications.                                       | CO5 BT2 (10) |
| Q. 6      | Explain Amazon Bedrock and describe how it provides access to multiple foundation models for enterprise use.                              | CO6 BT2 (10) |
| <b>OR</b> |   |              |
| Q. 6      | Compare the architecture and use cases of BERT and LaMDA, highlighting which model is more suitable for dialogue-based AI systems.        | CO6 BT4 (10) |

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