

END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] DEC 2025-JAN 2026

Paper Code: MS-401

Subject: Principles of Entrepreneurship Mindset

Time: 3 Hours

Maximum Marks: 75

Note: Attempt all questions as directed. Internal choice is indicated.
Assume missing data if any.

- Q1. Attempt **any five** of the following questions. (5×5=25)
- (a) Explain the different types of entrepreneurs with suitable examples.
 - (b) Explain the role of individual entrepreneurs in economic development.
 - (c) What legal issues should be considered while starting a new venture?
 - (d) How can a startup build a competitive advantage?
 - (e) A startup expects monthly inflows of ₹2,00,000 and outflows of ₹1,50,000. Calculate the monthly cash surplus and suggest how it can be managed.
 - (f) Explain the role of budgeting in financial planning.
 - (g) How does effective leadership contribute to venture success?
 - (h) Explain the role of e-commerce in modern entrepreneurial ventures.
- Q2 (a) Define entrepreneurship. Discuss its nature and significance in the Indian context. [6.25]
- (b) What are the key traits of an entrepreneurial mindset? [6.25]
- Or**
- Q3 (a) Discuss the stages in the development of entrepreneurship. [6.25]
- (b) Highlight the importance of entrepreneurship in India's growth story. [6.25]
- Q4 (a) What is creativity in entrepreneurship? Explain how it helps in developing business ideas. [6.25]
- (b) Describe the process of opportunity recognition and assessment. [6.25]
- Or**
- Q5 (a) Explain the steps involved in creating and starting a new venture. [6.25]
- (b) Discuss the importance of intellectual property rights for entrepreneurs. [6.25]
- Q6 (a) List and explain various sources of funds available to entrepreneurs. [6.25]
- (b) What are the key components of a successful financial plan? [6.25]
- Or**
- Q7 (a) Discuss the importance of cash flow management in a new venture. [6.25]
- (b) What are the essential elements of a business plan? [6.25]
- Q8 (a) What are the key elements of a powerful marketing plan? [6.25]
- (b) Explain the role of e-commerce in modern entrepreneurial ventures. [6.25]
- Or**
- Q9 (a) What is Integrated Marketing Communication (IMC)? How does it benefit startups? [6.25]
- (b) Discuss any one leadership model suitable for entrepreneurial teams. [6.25]

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SEVENTH SEMESTER [B.TECH] DECEMBER 2025-JANUARY 2026

Paper Code: CIE-431T

Subject: Web Mining

Time: 3 Hours

Maximum Marks:75

Note: Attempt five questions in all including Q.No.1 which is compulsory. Select one question from each unit.

- Q1 Explain the following (any five) (5x5=25)
- a) Compare and contrast *Data Mining* and *Web Mining* with examples.
 - b) What are the basic difference between OLAP and Data mining?
 - c) Discuss Web Spamming and its effects on Web Mining processes.
 - d) Explain the concepts of Opinion Mining and Sentiment Analysis with real-world applications.
 - e) What is Query Log Mining? Discuss its applications.
 - f) What is the process of Discovery and Analysis of Web Usage data?
 - g) What is Web Personalization, and how do Recommender Systems play a role in it?

UNIT-I

- Q2
- a) What is Web Structure Mining? Explain the concepts of Web Graph and PageRank. (6)
 - b) What Data Mining? Explain all the techniques of data mining in detail with diagram. (6.5)
- Q3
- a) What is the PageRank algorithm, and how does it impact web search engines? (6)
 - b) Explain the role of Machine Learning in Data Mining with examples of algorithms commonly used. (6.5)

UNIT-II

- Q4
- a) Explain the importance of Text and Web Page Pre-processing in Web Content Mining. (6)
 - b) What is Social Network Analysis? How is it applied in the context of Web Mining? Also explain Web Crawlers. (6.5)
- Q5
- a) Define Inverted Indices and explain their role in search engines. Also explain Latent Semantic Indexing. (6)
 - b) Explain how is Structured Data Extraction performed in Web Mining? What is the role of Web Crawler in Web Content Mining? (6.5)

UNIT-III

- Q6
- a) Explain the process of Data Collection and Pre-processing in Web Usage Mining. (6)
 - b) What is Web Usage Mining? How does it differ from Web Content and Web Structure Mining? (6.5)
- Q7
- a) What are the steps involved in the Discovery and Analysis of Web Usage? (6)
 - b) Define Recommender Systems. How does Collaborative Filtering enhance their performance? (6.5)

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UNIT-IV

- Q8 a) Discuss applications of Web Content and Structure Mining in e-commerce and social media platforms. (6)
b) How do Web Mining techniques enhance the efficiency of e-commerce systems? (6.5)
- Q9 a) What is Web Data Warehousing, and why is it essential for Web Mining applications? (6)
b) Provide an overview of tools, applications, and systems used for Web Mining. (6.5)

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END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] DECEMBER 2025-JANUARY 2026

Paper Code: ML-409T Subject: Reinforcement Learning and Deep Learning

Time: 3 Hours

Maximum Marks:75

Note: Attempt five questions in all including Q.No.1 which is compulsory. Select one question from each unit.

- Q1 Attempt any Five [5x5=25]
- a) Explain the various terms used in Reinforcement Learning.
 - b) Describe the RL framework with the help of an example.
 - c) What is policy optimization in reinforcement learning? How is it different from value-based methods?
 - d) What is model-based reinforcement learning? How does it differ from model-free RL?
 - e) What is Long Short-Term Memory (LSTM)? Why is it used?
 - f) What is deep learning? How does it is related with machine learning?
 - g) Describe the working of the sigmoid, tanh, and ReLU activation functions.
 - h) Differentiate between Continuous Skip-Gram Model and Continuous Bag-of-Words (CBOW) model.

UNIT-I

- Q2 Derive and explain the Bellman equations for value functions. Why are Bellman equations important in solving RL problems? [12.5]
- Q3 a) Discuss the advantages of using TensorFlow/Keras in building RL models. [6]
- b) Differentiate between Monte Carlo and Temporal-Difference (TD) methods. [6.5]

UNIT-II

- Q4 Explain the concept of Actor-Critic methods in reinforcement learning. Differentiate between A2C (Advantage Actor-Critic) and A3C (Asynchronous Advantage Actor-Critic). [12.5]
- Q5 Define meta-learning. How is it applied in reinforcement learning? What is Multi-Agent Reinforcement Learning (MARL)? Provide examples of its applications. [12.5]

UNIT-III

- Q6 Define a neural network. What are its types and applications? What is a perceptron? Discuss its structure and uses. [12.5]
- Q7 Discuss cost function, backpropagation and gradient descent in neural networks. Provide suitable example. [12.5]

UNIT-IV

- Q8 What is Natural Language Processing (NLP)? Explain its importance in AI. Discuss various applications of NLP. [12.5]
- Q9 Describe different methods of object detection in computer vision. Explain how Generative Adversarial Networks (GANs) are used for image generation. [12.5]

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SEVENTH SEMESTER [B.TECH] DECEMBER 2025 - JANUARY 2026

Paper Code: ML-411T

Subject: Pattern Recognition and Computer Vision

Time: 3 Hours

Maximum Marks: 75

Note: Attempt all questions as directed. Internal choice is indicated.

- Q1 Attempt **any five** of the following questions: (5x5=25)
- (a) Support Vector Machines
 - (b) Naïve Bayes Classifiers
 - (c) Multilayer feed forward network
 - (d) Centroidal Profiles
 - (e) Boundary Length Measures
 - (f) Texture Analysis
- Q2 Explain Naive Bayes Classifier. How is it different from decision tree. What is the distinction between prior probability and posterior probability. (4+4+4.5)
- OR**
- Q3 What is Instance based learning. Explain how Instance based learning algorithms are used for enhancing performance of supervised learning algorithms. (3+9.5)
- Q4 What do you understand by parameter estimation and when does it apply? Define Maximum Likelihood (ML) estimation. What are the values of the mean and standard deviation estimated using ML in case of a univariate normal distribution? (4+4+4.5)
- OR**
- Q5 What is the curse of dimensionality. How to mitigate the curse of dimensionality using Fisher's sample linear discriminant? How linear discriminant analysis is better than PCA? (4+4+4.5)
- Q6 Explain image thresholding techniques. What is the difference between local and global thresholding. What are thresholding methods. (4+4+4.5)
- OR**
- Q7 What is edge detection? Explain any two edge detection techniques in detail. (2+10.5)
- Q8 What is Object labeling and counting. Explain the steps involved in object labeling and counting. (4+4+4.5)
- OR**
- Q9 Explain Contours. How contours are detected. Explain practical results obtained using active contours. (4+4+4.5)

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END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] DECEMBER 2025-JANUARY 2026

Paper Code: CIE-421T/ML-407T

Subject: Machine Learning

Time: 3 Hours

Maximum Marks: 75

Note: Attempt all questions as directed. Internal choice is indicated.

- Q1 Attempt **any Five** of the following Questions (5x5=25)
- a) What are the key tasks of machine learning?
 - b) What is the difference between supervised learning and unsupervised learning?
 - c) What is independent component analysis? Discuss
 - d) What is Bayes theorem? How is it useful in machine learning context?
 - e) Explain the over fitting.
 - f) What is nearest neighbor?
 - g) How is KNN different from K-means clustering?
 - h) What is bagging and boosting?
- Q2 What is learning system? Explain the application of machine learning. (12.5)
- OR**
- Q3 Define machine learning? Discuss the issues in machine learning. (12.5)
- Q4 What is PCA? Write down the difference between PCA and LDA. (12.5)
- OR**
- Q5 Explain in brief logistic regression, simple linear regression and multiple regression. (12.5)
- Q6 What is support vector machine? Explain briefly issues in SVM. (12.5)
- OR**
- Q7 What is classification? Explain the classification Errors? (12.5)
- Q8 What is density based clustering? Discuss any one density based clustering algorithm. (12.5)
- OR**
- Q9 Discuss K-Means clustering with example. Also discuss value function approximation. (12.5)

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END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] DECEMBER 2025

Paper Code: CIE-405T/MAO-417T

Subject: Data Science

Time: 3 Hours

Maximum Marks: 75

Note: Attempt all questions as directed. Internal choice is indicated.

Q1 Attempt **any five** of the following questions:- (5x5=25)

- (a) What is overfitting, and how can it be overcome?
- (b) Explain the concepts of Bias-Variance trade-off in machine learning.
- (c) What are outliers in the dataset, and how can we detect and remove them?
- (d) What R data structure would you use to store a dataset with rows = observations and columns = variables? Give the R command to read the CSV file data.csv into that structure
- (e) Explain PCA and the advantages and limitations of PCA. Also Provide at least two real-world applications of PCA in data analysis
- (f) What is the difference between cross-validation and train-test split?
- (g) Given the contingency table below, compute the (Pearson) chi-square statistic

	Yes	No	Row total
Group A	20	10	30
Group B	30	40	70
Column total	50	50	100

- (h) Two cluster centroids are $A=(2,3)$, $B=(5,7)$. For point $P=(4,6)$, which cluster is closer?

Q2 Explain the stages of data preprocessing. Explain the importance of data visualization in identifying patterns and outliers. (12.5)

OR

Q3 Calculate Pearson's correlation coefficient for $X=[2,4,6,8,10]$ and $Y=[1,2,3,4,5]$. (12.5)

Q4 Compare linear, generalized, and nonlinear regression in terms of assumptions and applications. (12.5)

OR

Q5 Define latent variables with suitable examples. Also explain basic structure of Structural Equation Modelling (SEM). (12.5)

Q6 Explain the concept of stationarity in time series analysis. Clearly differentiate between strict and weak stationarity with suitable examples. Discuss why ensuring stationarity is important in time series modeling. Finally, for the given series $[200,220,240,260,280]$, apply first differencing and comment on whether the resulting series is stationary. (12.5)

OR

Q7 Explain the concept of recurrent models in time series forecasting and highlight how they differ from classical autoregressive (AR) models. Discuss the importance of feedback connections in recurrent structures. (12.5)

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P.T.O.

Q8 ✓ Provide an overview of Support Vector Machines (SVM). Explain the concept of the optimal hyperplane, margin maximization, and support vectors. Discuss how SVM handles non-linear data using kernel functions. Illustrate with a diagram. (12.5)

OR

Q9 Explain the structure and working of a decision tree. Highlight the advantages and disadvantages of decision trees in classification tasks. (12.5)

For the given table below find the Entropy of the data set.

Outlook	Temp	Play?
Sunny	Hot	No
Sunny	Cool	Yes
Rainy	Cool	Yes

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