

Unit-2: Advanced Concepts of Modeling in AI

Section A: Basics of AI, ML, DL

1. Which of the following is the umbrella term that includes both ML and DL?
 - a) Machine Learning
 - b) Artificial Intelligence
 - c) Deep Learning
 - d) Data Science

Answer: b) Artificial Intelligence

2. Machine Learning enables machines to:
 - a) Mimic human intelligence without data
 - b) Train themselves with vast datasets only
 - c) Improve performance through experience
 - d) Create rules without any data

Answer: c) Improve performance through experience

3. Deep Learning is a subset of:
 - a) Artificial Intelligence only
 - b) Machine Learning
 - c) Data Science
 - d) Rule-Based Models

Answer: b) Machine Learning

4. Which approach allows a system to **train itself with large amounts of data**?
 - a) Artificial Intelligence
 - b) Machine Learning
 - c) Deep Learning
 - d) Rule-Based Approach

Answer: c) Deep Learning

5. Which one of these is the **broadest category**?
 - a) DL
 - b) ML
 - c) AI
 - d) ANN

Answer: c) AI

Section B: Data and Features

6. In a dataset, columns are referred to as:

- a) Rows
- b) Labels
- c) Features
- d) Variables only

Answer: c) Features

7. What are labels in a dataset?

- a) Raw unprocessed data
- b) Tags attached to data for identification
- c) Features like size and color
- d) A type of neural network node

Answer: b) Tags attached to data for identification

8. Data without any tags is called:

- a) Labeled Data
- b) Structured Data
- c) Unlabeled Data
- d) Classified Data

Answer: c) Unlabeled Data

9. Which dataset is used for teaching the model?

- a) Testing dataset
- b) Training dataset
- c) Validation dataset
- d) Output dataset

Answer: b) Training dataset

10. Which dataset checks accuracy of the model?

- a) Training dataset
- b) Testing dataset
- c) Raw dataset
- d) Feature dataset

Answer: b) Testing dataset

Section C: AI Modelling Approaches

11. Rule-Based AI works on:

- a) Self-learning from examples
- b) Predefined rules and instructions

- c) Continuous adaptation
- d) Neural networks

Answer: b) Predefined rules and instructions

12. A drawback of rule-based AI is:

- a) It cannot handle FAQs
- b) It adapts too quickly
- c) Learning is static and does not improve
- d) Requires massive datasets

Answer: c) Learning is static and does not improve

13. A chatbot that works only on pre-programmed responses is an example of:

- a) Rule-Based AI
- b) Learning-Based AI
- c) Deep Learning
- d) Reinforcement Learning

Answer: a) Rule-Based AI

14. A spam email filter that adapts to new data is an example of:

- a) Rule-Based AI
- b) Supervised Learning
- c) Reinforcement Learning
- d) Association Model

Answer: b) Supervised Learning

15. Learning-Based AI refers to:

- a) Writing rules manually
- b) Machines learning from examples and feedback
- c) Using only raw data
- d) Static decision-making

Answer: b) Machines learning from examples and feedback

Section D: Machine Learning Types

16. Supervised Learning requires:

- a) Unlabeled Data
- b) Rewards and Penalties
- c) Labeled Data
- d) No Data

Answer: c) Labeled Data

17. Unsupervised Learning works on:

- a) Data with labels
- b) Trial and error
- c) Random unlabeled data
- d) Static datasets only

Answer: c) Random unlabeled data

18. Reinforcement Learning focuses on:

- a) Labeled Data
- b) Grouping patterns
- c) Maximizing rewards through feedback
- d) Association rules only

Answer: c) Maximizing rewards through feedback

19. Identifying whether an email is **spam or not spam** is:

- a) Classification
- b) Regression
- c) Clustering
- d) Reinforcement

Answer: a) Classification

20. Predicting the **price of a house** is:

- a) Classification
- b) Regression
- c) Clustering
- d) Association

Answer: b) Regression

Section E: Classification & Regression

21. Classification works on:

- a) Continuous values
- b) Discrete categories
- c) Random clustering
- d) Unlabeled data

Answer: b) Discrete categories

22. Regression models predict:

- a) Discrete outcomes
- b) Continuous values

- c) Grouping only
- d) Labels only

Answer: b) Continuous values

23. Predicting whether a customer is eligible for a loan is:

- a) Regression
- b) Classification
- c) Clustering
- d) Association

Answer: b) Classification

24. Predicting temperature for the next 24 hours is:

- a) Classification
- b) Regression
- c) Clustering
- d) Reinforcement

Answer: b) Regression

25. Predicting a car's resale price is an example of:

- a) Regression
- b) Classification
- c) Clustering
- d) Association

Answer: a) Regression

Section F: Unsupervised Models

26. Grouping songs into "liked" and "disliked" categories by patterns is:

- a) Regression
- b) Classification
- c) Clustering
- d) Reinforcement

Answer: c) Clustering

27. The main difference between clustering and classification is:

- a) Both need labeled data
- b) Classification uses predefined classes, clustering does not
- c) Clustering uses labels, classification does not
- d) Both are supervised

Answer: b) Classification uses predefined classes, clustering does not

28. Finding patterns of items purchased together in a store is:

- a) Clustering
- b) Association
- c) Classification
- d) Regression

Answer: b) Association

29. Netflix recommending movies based on watch history uses:

- a) Supervised Learning
- b) Reinforcement Learning
- c) Unsupervised Learning (Clustering)
- d) Regression

Answer: c) Unsupervised Learning (Clustering)

30. Identifying fraud in banking by unusual transactions is:

- a) Supervised
- b) Reinforcement
- c) Unsupervised (Anomaly Detection)
- d) Rule-Based

Answer: c) Unsupervised (Anomaly Detection)

Section G: Reinforcement Learning

31. Reinforcement Learning is based on:

- a) Trial and Error
- b) Predefined Labels
- c) Clustering
- d) Static Rules

Answer: a) Trial and Error

32. Parking a car with repeated attempts is:

- a) Supervised Learning
- b) Unsupervised Learning
- c) Reinforcement Learning
- d) Regression

Answer: c) Reinforcement Learning

33. Which of the following does NOT require labeled data?

- a) Supervised Learning
- b) Regression

- c) Reinforcement Learning
- d) Classification

Answer: c) Reinforcement Learning

34. An AI agent playing chess and learning from wins/losses is:

- a) Supervised
- b) Reinforcement
- c) Unsupervised
- d) Regression

Answer: b) Reinforcement

35. Reinforcement Learning differs because it:

- a) Needs massive datasets
- b) Can adapt to unforeseen environments
- c) Requires labeled data
- d) Is rule-based only

Answer: b) Can adapt to unforeseen environments

Section H: Neural Networks & Deep Learning

36. Neural networks are inspired by:

- a) Internet connections
- b) Human brain
- c) Decision trees
- d) Mathematical equations only

Answer: b) Human brain

37. Which layer only **accepts data** but does not process it?

- a) Input Layer
- b) Hidden Layer
- c) Output Layer
- d) Association Layer

Answer: a) Input Layer

38. Actual processing in a neural network occurs in:

- a) Input Layer
- b) Hidden Layer
- c) Output Layer
- d) Feature Layer

Answer: b) Hidden Layer

39. The layer that provides results to the user is:

- a) Input Layer
- b) Hidden Layer
- c) Output Layer
- d) Regression Layer

Answer: c) Output Layer

40. Adjusting weights and biases during learning is:

- a) Optimization
- b) Regression
- c) Classification
- d) Clustering

Answer: a) Optimization

Section I: Deep Learning Types

41. Artificial Neural Networks (ANN) are modeled after:

- a) Rule-based systems
- b) Human brain neurons
- c) Database models
- d) Statistical regression

Answer: b) Human brain neurons

42. CNN is most useful for:

- a) Image recognition
- b) Predicting prices
- c) Spam classification only
- d) Association rules

Answer: a) Image recognition

43. Which type of AI handles very large datasets effectively?

- a) Rule-Based
- b) ANN
- c) Regression
- d) Association

Answer: b) ANN

44. Deep Neural Networks are networks with:

- a) Single Layer
- b) Multiple Hidden Layers

- c) Only Input Layer
- d) Rule-based instructions

Answer: b) Multiple Hidden Layers

45. Digit recognition (0–9) is an application of:

- a) Classification
- b) Deep Learning (ANN)
- c) Regression
- d) Association

Answer: b) Deep Learning (ANN)

Section J: Applications & Case Studies

46. Identifying a friend in a social media photo uses:

- a) Supervised Learning
- b) Unsupervised Learning
- c) Reinforcement Learning
- d) Association

Answer: a) Supervised Learning

47. Grouping customers by shopping patterns without labels is:

- a) Supervised Learning
- b) Reinforcement Learning
- c) Unsupervised Learning
- d) Regression

Answer: c) Unsupervised Learning

48. Predicting the number of hospital stay days is:

- a) Classification
- b) Regression
- c) Clustering
- d) Association

Answer: b) Regression

49. Predicting if a loan will default (Yes/No) is:

- a) Regression
- b) Classification
- c) Clustering
- d) Association

Answer: b) Classification

50. Discovering which products are usually bought together in a supermarket is:

- a) Classification
- b) Clustering
- c) Regression
- d) Association

Answer: d) Association