Section – A (20 questions)

1. **What is Artificial Intelligence (AI)?**

a) The ability of machines to think and learn like humans

b) The ability of machines to mimic human behavior

c) The ability of machines to perform tasks that typically require human intelligence

d) The ability of machines to perform repetitive tasks

**2. Which of the following is NOT a popular application of Machine Learning (ML)?**

a) Image recognition b) Natural language processing

c) Social media sharing d) Autonomous driving

**3. What is the primary programming language used for AI and ML?**

a) Java b) Python c) C++ d) JavaScript

4**. Which Python library is commonly used for numerical operations and array manipulation in AI and ML?**

a) TensorFlow b) PyTorch c) NumPy d) Pandas

**5. What is the primary data structure used in Pandas for storing two-dimensional labeled data?**

a) Series b) Array c) DataFrame d) Tuple

**6. How can you read a CSV file into a DataFrame in Pandas?**

a) `pd.read\_csv()` b) `pd.load\_csv()` c) `pd.read\_file()` d) `pd.load\_file()`

**7. What is the purpose of descriptive statistics?**

a) To summarize and describe data b) To predict future outcomes

c) To clean and preprocess data d) To visualize data

**8. Which statistical measure represents the average value of a dataset?**

a) Variance b) Standard deviation c) Median d) Mean

**9. What is the primary purpose of Exploratory Data Analysis (EDA)?**

a) To clean and preprocess data b) To predict future outcomes

c) To understand the characteristics of the data d) To visualize data

**10. Which Python library is commonly used for creating visualizations in AI and ML?**

a) NumPy b) Matplotlib c) Pandas d) TensorFlow

**11. What is the primary goal of supervised learning?**

a) To find hidden patterns in data b) To classify data into predefined categories

c) To explore the structure of data d) To predict future outcomes based on past data

**12. What are the two main components of a supervised learning algorithm?**

a) Features and labels b) Training and testing

c) Mean and median d) Variance and standard deviation

**13. Which of the following is an example of unsupervised learning?**

a) Spam email detection b) Image recognition

c) Customer segmentation d) Stock price prediction

**14. What is the purpose of the scikit-learn library in Python?**

a) Web development b) Machine learning algorithms

c) Data visualization d) Text processing

**15. What type of learning is used when a machine learns from its experiences?**

a) Supervised learning b) Unsupervised learning

c) Reinforcement learning d) Semi-supervised learning

**16. Which type of visualization is suitable for showing the distribution of a single variable?**

a) Line plot b) Scatter plot c) Histogram d) Box plot

**17. What is the primary purpose of data cleaning and preprocessing?**

a) To reduce the size of the dataset b) To enhance the complexity of the dataset

c) To remove noise and inconsistencies in the data d) To increase the variability of the data

**18. What is the first step in any machine learning project?**

a) Data cleaningb) Model building

c) Data visualization d) Data preprocessing

**19. Which of the following is NOT a commonly used visualization library in Python?**

a) Matplotlibb) Seabornc) Plotlyd) TensorFlow

**20. Which statistical measure represents the spread or dispersion of a dataset?**

a) Meanb) Medianc) Varianced) Mode

Section – B (15 questions)

**21.What is the mean of the dataset: `[12, 15, 18, 22, 25]`?**

a) 18.4b) 18.2c) 18.4 d) 18.6

**22. Consider a DataFrame with the column 'Age'. If the DataFrame has 100 rows and the mean age is 35, what is the total sum of ages?**

- a) 3500 b) 3550 c) 3450 d) 3600

**23. Calculate the median for the dataset: `[25, 30, 35, 40, 45, 50, 55]`.**

a) 40 b) 35 c) 45 d) 42.5

**24. Given a DataFrame with columns 'Quantity' and 'Price', if the DataFrame has 50 rows and the total sales revenue is $5000, what is the average price per unit?**

a) $100 b) $50 c) $75 d) $125

**25. Calculate the standard deviation for the dataset: `[8, 10, 12, 15, 20]`.**

a) 3.5 b) 4.5 c) 5.5 d) 6.5

26. **Consider a DataFrame with columns 'Height' (in cm) and 'Weight' (in kg). If the DataFrame has 50 rows and the total weight is 2500 kg, what is the average weight per individual?**

a) 50 kg b) 55 kg c) 60 kg d) 45 kg

**27. Calculate the variance for the dataset: `[5, 8, 12, 15, 20]`.**

a) 20.5 b) 22.5 c) 24.5 d) 26.5

**28. Given a DataFrame with columns 'Length' (in meters) and 'Width' (in meters), if the DataFrame has 100 rows and the total area is 500 square meters, what is the average length?**

a) 5 meters b) 10 meters c) 15 meters d) 20 meters

29**. Calculate the interquartile range (IQR) for the dataset: `[5, 8, 12, 15, 20]`.**

a) 8 b) 7 c) 6 d) 5

30. **Consider a DataFrame with the columns 'Length' and 'Width'. If the DataFrame has 50 rows and the total perimeter is 300 meters, what is the average width?**

a) 4 metersb) 6 metersc) 8 meters d) 10 meters

**31. Calculate the mean absolute deviation (MAD) for the dataset: `[10, 15, 20, 25, 30]`.**

a) 4b) 5c) 6d) 7

**32. Given a DataFrame with columns 'Temperature' (in Celsius) and 'Humidity' (in percentage). If the DataFrame has 50 rows and the total humidity is 2000%, what is the average temperature?**

a) 20°C b) 25°C c) 30°C d) 35°C

**33. Calculate the coefficient of variation (CV) for the dataset: `[15, 20, 25, 30, 35]`.**

a) 0.20 b) 0.25 c) 0.30 d) 0.35

**34. Consider a DataFrame with the columns 'Length' (in meters) and 'Width' (in meters). If the DataFrame has 100 rows and the total area is 600 square meters, what is the average length?**

a) 5 meters b) 6 meters c) 7 meters d) 8 meters

**35. Calculate the root mean squared error (RMSE) for the dataset: `[10, 15, 20, 25, 30]`, if the predicted values are `[12, 18, 21, 24, 29]`.**

a) 1.58 b) 1.73 c) 2.08 d) 2.24