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| | **GEETHANJALIINSTITUTEOFSCIENCE&TECHNOLOGY**<br>**(ANAUTONOMOUS INSTITUTION)**<br>**(Approved by AICTE, New Delhi & Affiliated to JNTUA, Ananthapuramu)**<br>**(Accredited by NAAC with "A" Grade, NBA(EEE,ECE&ME)&ISO9001:2008 Certified Institution)** |

**QUESTION BANK (DESCRIPTIVE)**

**Subject Name: Predictive Analytics**
**Subject Code: 23A3210T**

**Course & Branch :** B.Tech & CSE(DS)
**Year & Semester: III B.Tech II Semester** **Regulation:** RG23

## Unit-1

| S.No | 2 Marks Questions (Short) | [BT Level][CO][Marks] |
|---|---|---|
| 1 | Define Predictive Analytics | L1, CO1, 2 M |
| 2 | What is the role of Business Intelligence in Predictive Analytics? | L1, CO1, 2 M |
| 3 | List any two types of predictive models. | L1, CO1, 2 M |
| 4 | What is classification in predictive modeling? | L1, CO1, 2 M |
| 5 | What is regression analysis? | L1, CO1, 2 M |
| 6 | Differentiate supervised and unsupervised learning. | L1, CO1, 2 M |
| 7 | Mention any two applications of predictive analytics. | L1, CO1, 2 M |
| 8 | What is a predictive modeling workflow? | L1, CO1, 2 M |
| 9 | State any two challenges in predictive analytics. | L1, CO1, 2 M |
| 10 | What is time series prediction? | L1, CO1, 2 M |

| S.No | Descriptive Questions (Long) | [BT Level] [CO][ Marks] |
|---|---|---|
| 1 | (a) Explain Predictive Analytics and its importance in business decision-making.<br>(b) Discuss the role of Business Intelligence in Predictive Analytics with examples. | L2, CO1, 5M<br>L2, CO1, 5M |
| 2 | (a) Explain classification and regression models with suitable examples.<br>(b) Compare supervised and unsupervised learning techniques. | L2, CO1, 5M<br>L2, CO1, 5M |
| 3 | Describe the predictive modeling workflow with neat diagram. | L2, CO1, 10M |

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| 4 | (a) Discuss challenges faced in predictive analytics.<br>(b) Explain time series predictive models with real-world use cases. | L2, CO1, 5M<br><br>L2, CO1, 5M |
| 5 | Explain how Predictive Analytics is used in Healthcare decision-making. | L3, CO1, 10M |
| 6 | Explain applications of predictive analytics in marketing and finance. | L2, CO1, 10M |
| 7 | Explain different types of predictive models with suitable examples. | L2, CO1, 10M |
| 8 | Compare descriptive, diagnostic, predictive, and prescriptive analytics. | L2, CO1, 10M |
| 9 | Illustrate real-world applications of predictive analytics. | L2, CO1, 10M |
| 10 | Differentiate Predictive Analytics and Business Intelligence with suitable use cases. | L2, CO1, 10M |

UNIT-2

| S.No | 2 Marks Questions (Short) | [BT Level][CO][Marks] |
|---|---|---|
| 1 | What is data cleaning? | L1, CO3, 2 M |
| 2 | Define missing data. | L1, CO3, 2 M |
| 3 | What is noisy data? | L1, CO3, 2 M |
| 4 | What is feature selection? | L1, CO3, 2 M |
| 5 | Define dimensionality reduction. | L1, CO3, 2 M |
| 6 | What is PCA? | L1, CO3, 2 M |
| 7 | What is LDA? | L1, CO3, 2 M |
| 8 | Differentiate normalization and standardization. | L1, CO3, 2 M |
| 9 | What is categorical data encoding? | L1, CO3, 2 M |
| 10 | What is class imbalance? | L1, CO3, 2 M |

| S.No | Descriptive Questions (Long) | [BT Level] [CO][ Marks] |
|---|---|---|
| 1 | Explain the importance of data cleaning in predictive modeling. | L2, CO3, 10M |
| 2 | (a) Describe methods for handling missing data with examples.<br>(b) Explain techniques used to handle noisy and inconsistent data. | L2, CO3, 5M<br>L2, CO3, 5M |
| 3 | (a) Describe Principal Component Analysis (PCA) with steps and advantages.<br>(b) Explain Linear Discriminant Analysis (LDA) and compare it with PCA. | L2, CO3, 5M<br>L2, CO3, 5M |
| 4 | Discuss Feature Selection techniques and their impact on model performance. | L3, CO3, 10M |
| 5 | Differentiate Normalization and Standardization with examples. | L2, CO3, 10M |
| 6 | Describe Feature Extraction and Feature Construction with examples. | L2, CO3, 10M |
| 7 | Discuss techniques to handle imbalanced datasets. | L3, CO3, 10M |
| 8 | Explain data preprocessing steps required before model building. | L2, CO3, 10M |
| 9 | Explain Dimensionality Reduction and its need in high-dimensional datasets. | L2, CO3, 10M |
| 10 | Explain the problem of class imbalance and its impact on model accuracy. | L2, CO3, 10M |

Unit-3

| S.No | 2 Marks Questions (Short) | [BT Level][CO][Marks] |
|---|---|---|
| 1 | Define linear regression. | L1, CO2, 2M |
| 2 | What is polynomial regression? | L1, CO2, 2M |
| 3 | What is logistic regression used for? | L1, CO2, 2M |
| 4 | Define decision tree. | L1, CO2, 2M |
| 5 | What is Random Forest? | L1, CO2, 2M |
| 6 | What is k-NN algorithm? | L1, CO2, 2M |
| 7 | Define Naïve Bayes classifier. | L1, CO2, 2M |

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| 8 | What is Support Vector Machine (SVM)? | L1, CO2, 2M |
| 9 | What is model selection? | L1, CO2, 2M |
| 10 | What is model comparison? | L1, CO2, 2M |

| S.No | Descriptive Questions (Long) | [BT Level] [CO][ Marks] |
|---|---|---|
| 1 | Describe Polynomial Regression and compare it with Linear Regression. | L3, CO2, 10M |
| 2 | Explain Logistic Regression for binary classification problems. | L2, CO2, 10M |
| 3 | Describe k-Nearest Neighbors (k-NN) algorithm and its working principle. | L2, CO2, 10M |
| 4 | (a) Explain Linear Regression and its assumptions<br>(b) Describe Decision Tree algorithm with a neat example. | L2, CO2, 5M<br>L2, CO2, 5M |
| 5 | Describe real-world applications of classification algorithms. | L2, CO2, 10M |
| 6 | Explain overfitting in regression models with examples. | L2, CO2, 10M |
| 7 | Explain model selection criteria for classification models. | L2, CO2, 10M |
| 8 | Compare Logistic Regression and SVM. | L3, CO3, 10M |
| 9 | Describe Support Vector Machines (SVM) with kernel functions. | L2, CO2, 10M |
| 10 | Explain Naïve Bayes classifier and its probabilistic assumptions. | L2, CO2, 10M |

Unit-4

| S.No | 2 Marks Questions (Short) | [BT Level][CO][Marks] |
|---|---|---|
| 1 | Explain training, testing, and validation datasets. | L1, CO4, 2M |
| 2 | Explain k-fold cross validation. | L1, CO4, 2M |
| 3 | Explain stratified cross validation. | L1, CO4, 2M |
| 4 | Explain confusion matrix. | L1, CO4, 2M |
| 5 | Explain accuracy and precision. | L1, CO4, 2M |

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| 6 | Explain recall and F1-score. | L1, CO4, 2M |
| 7 | Explain ROC curve and AUC. | L1, CO4, 2M |
| 8 | Explain bias–variance trade-off. | L1, CO4, 2M |
| 9 | Explain overfitting and underfitting. | L1, CO4, 2M |
| 10 | Explain hyperparameter tuning techniques. | L1, CO4, 2M |

| S.No | Descriptive Questions (Long) | [BT Level] [CO][ Marks] |
|---|---|---|
| 1 | Explain the need for training, testing, and validation datasets. | L2, CO4, 10M |
| 2 | Describe k-Fold Cross Validation with advantages. | L2, CO4, 10M |
| 3 | (a) Explain Bias-Variance Trade-off.<br>(b) Explain Confusion Matrix with a suitable example. | L2, CO4, 5M<br>L2, CO4, 5M |
| 4 | Explain Stratified Cross Validation and its applications. | L2, CO4, 10M |
| 5 | Describe Leave-One-Out Cross Validation (LOOCV). | L2, CO4, 10M |
| 6 | Describe Random Search and compare it with Grid Search. | L3, CO4, 10M |
| 7 | Explain model validation techniques for real-time systems. | L2, CO4, 10M |
| 8 | Describe Overfitting and Underfitting with remedies. | L2, CO4, 10M |
| 9 | Analyze the impact of evaluation metrics on business decisions. | L3, CO4, 10M |
| 10 | Explain Hyperparameter Tuning using Grid Search. | L2, CO4, 10M |

Unit-5

| S.No | 2 Marks Questions (Short) | [BT Level][CO][Marks] |
|---|---|---|
| 1 | What is ensemble learning? | L1, CO5, 2M |
| 2 | Define bagging technique. | L1, CO5, 2M |
| 3 | What is boosting? | L1, CO5, 2M |
| 4 | What is AdaBoost? | L1, CO5, 2M |
| 5 | What is XGBoost? | L1, CO5, 2M |

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| 6 | What is ARIMA model? | L1, CO5, 2M |
| 7 | What is LSTM? | L1, CO5, 2M |
| 8 | Mention any one application of predictive analytics in healthcare. | L1, CO5, 2M |
| 9 | What is ethical issue in predictive analytics? | L1, CO5, 2M |
| 10 | What is an end-to-end predictive system? | L1, CO5, 2M |

| S.No | Descriptive Questions (Long) | [BT Level] [CO][ Marks] |
|---|---|---|
| 1 | Describe Bagging technique with an example. | L2, CO5, 10M |
| 2 | Explain Boosting and AdaBoost algorithm. | L2, CO5, 10M |
| 3 | (a) Describe XGBoost and its advantages<br>(b) Explain Ensemble Learning and its benefits. | L2, CO5, 5M<br>L2, CO5, 5M |
| 4 | Explain Time Series forecasting and its components. | L2, CO5, 10M |
| 5 | Explain LSTM networks and their role in sequence prediction. | L2, CO5, 10M |
| 6 | (a) Describe ARIMA model with assumptions.<br>(b) Explain Prophet model and its applications. | L2, CO5, 10M |
| 7 | Describe Artificial Neural Networks (ANNs). | L2, CO5, 10M |
| 8 | Discuss healthcare applications of predictive modeling. | L2, CO5, 10M |
| 9 | Explain the role of Predictive Analytics in Retail industry. | L2, CO5, 10M |
| 10 | Describe steps involved in building and deploying end-to-end predictive systems. | L2, CO5, 10M |

Signature of the Staff :

Signature of Department Academic Committee Member 1:

Signature of Department Academic Committee Member 2:

Signature of Department Academic Committee Member 3: