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| LOGO.jpg | **GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY**  (**ANAUTONOMOUS INSTITUTION**)  **(Approved by AICTE, New Delhi & Affiliated to JNTUA, Ananthapuramu)**  **(Accredited by NAAC with “A” Grade, NBA(EEE, ECE & ME) & ISO 9001:2008 Certified Institution)** |
| **QUESTION BANK (DESCRIPTIVE)**  **Subject Name with Code: MACHINELEARNING(23A3205T)**  **Course & Branch: B. Tech CSE(DS) Year & Semester: III-I Regulation: RG23** | |

**UNIT - I**

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| **S.No.** | **Question** | **[BTLevel] [CO][Marks]** |
| **2 Marks Questions(Short)** | | |
| 1. | List any four examples of Supervised Machine Learning. | L1/CO1/2M |
| 2. | List basic types of data in Machine Learning | L1/CO1/2M |
| 3. | What is dimensionality reduction? | L1/CO1/2M |
| 4. | Outline bootstrap sampling? | L1/CO1/2M |
| 5. | What is data transformation? | L1/CO1/2M |
| 6. | Define human learning with example. | L1/CO1/2M |
| 7. | Define data cleaning. | L1/CO1/2M |
| 8. | Relate the terms penalty and reward in reinforcement learning | L2/CO1/2M |
| 9. | Interpret reinforcement learning. | L1/CO1/2M |
| 10. | What is generalization? | L2/CO1/2M |
| **Descriptive Questions(Long)** | | |
| **1** | What is Human Learning? Explain different types of human Learnings. | L2/CO1/12M |
| **2** | What is Machine Learning? Explain different forms of Machine Learning, with few examples. | L2/CO1/12M |
| **3** | Explain Supervised and Unsupervised Machine leanings. | L2/CO1/12M |
| **4** | Explain the Banking and Finance, Healthcare and Insurance applications of machine learning. | L2/CO1/12M |
| **5** | Compare between different types of data in ML. | L2/CO1/12M |
| **6** | Explain the applications of machine learning. | L2/CO1/12M |
| **7** | Explaindifferentissuesinmachinelearning. | L2/CO1/12M |
| **8** | Explain the process of data cleaning and Data Transformation. | L2/CO1/12M |
| **9** | Discuss the significance of data preprocessing in machine learning. | L2/CO1/12M |

**UNIT - II**

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| **S.No.** | **Question** | **[BTLevel] [CO][Marks]** | |
| **2 Marks Questions(Short)** | | | |
| **1** | Define Sensitivity of a model. | | L1/CO2/2M |
| **2** | Compare between predictive and descriptive models. | | L3/CO2/2M |
| **3** | Identify the use of kappa value? | | L3/CO2/2M |
| **4.** | Define Random Sampling. | | L1/CO2/2M |
| **5.** | What is hold-out method? | | L1/CO2/2M |
| **6.** | Write the formula for F1-Score. | | L1/CO2/2M |
| **7.** | Define the need for bootstrap sampling. | | L1/C02/2M |
| **8.** | Contrast between under fitting and over fitting | | L2/CO2/2M |
| **9.** | Find the use of Ensemble approach | | L1/CO2/2M |
| **10.** | Write formulae for Precision and Recall | | L1/CO2/2M |
| **Descriptive Questions(Long)** | | | |
| **1** | Explain how to selecting a model in machine learning? | | L2/CO2/12M |

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| **2** | Explain various methods used to train a model. | L2/CO2/12M |
| **3** | Explain K-fold Cross-validation method in detail. | L2/CO2/12M |
| **4** | Identify the differences between k-fold cross-validation and bootstrapping. | L3/CO2/12M |
| **5.** | Apply all the cases involved in evaluating the performance of a classification model in supervised learning. | L3/CO2/12M |
| **6.** | Demonstrate the model interpretability and representation. | L2/CO2/12M |
| **7.** | Choose the approaches involved in evaluating the performance of a  Clustering model in unsupervised learning. | L3/CO2/12M |
| **8.** | Illustrate ensemble approach to improve the performance of a model. | L3/CO2/12M |

**UNIT - III**

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| **S.No.** | | **Question** | **[BT Level] [CO][ Marks]** | |
| **2 Marks Questions (Short)** | | | | |
| 1. | What is supervised learning? Why it is called so? | | | L1/CO3/2M |
| 2. | List any 2 examples of supervised learning. | | | L1/CO3/2M |
| **3.** | Define classification and regression in supervised learning? | | | L1/CO3/2M |
| **4.** | List few examples of common classification algorithms. | | | L1/CO3/2M |
| **5.** | What are the advantages of the Naïve Bayes model? | | | L1/CO3/2M |
| **6.** | List the disadvantages of the k-NN algorithm? | | | L1/CO3/2M |
| **7.** | Define entropy of a decision tree. | | | L2/CO3/2M |
| **8.** | Define information gain in a decision tree. | | | L2/CO3/2M |
| **9.** | Outline three weaknesses of a decision tree method. | | | L2/CO3/2M |
| **10.** | Define random forest model. | | | L2/CO3/2M |
| **Descriptive Questions (Long)** | | | | |
| **1** | Differentiate between supervised learning, semi-supervised learning, and unsupervised learning | | | L2/CO3/12M |
| **2** | Explain any five examples of classification problems in detail. | | | L2/CO3/12M |
| **3** | Explain classification learning steps in detail. | | | L2/CO3/12M |
| **4** | Apply k-NN algorithm by taking suitable dataset to find a class label for new example . | | | L3/CO3/12M |
| **5** | Apply Backpropagation technique by assume that neurons have a sigmoid activation function perform a forward pass and a backward pass the network.  Assume that the actual output of y is 0.5 and learning rate is 1. Perform another forward pass. | | | L3/CO3/12M |
| **6** | Apply Naïve Bayes technique by using the following dataset to find a class label. | | | L3 |
| **7** | Construct an algorithm for random forest by choosing ensemble learning technique with an example | | | L3/CO3/12M |
| **8** | Construct an algorithm for random forest tree by choosing Bagging and Bootstrapping approaches | | | L3/CO3/12M |
| **9** | Construct decision tree usingID3 algorithm for the following data set. | | | L3/CO3/12M |

**UNIT - III**

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| **S.No.** | | **Question** | **[BT Level] [CO][ Marks]** |
| **2 Marks Questions (Short)** | | | |
| **1** | | Compare dependent and an independent variable in a linear equation | L4/CO4/2M |
| **2** | | What is simple linear regression? Give one example. | L1/CO4/2M |
| **3** | | Define slope in a linear regression. | L2/CO4/2M |
| **4** | | Compare and contrast between the conditions of a positive slope & negative slope in linear regression? | L4/CO4/2M |
| **5** | | Define multiple linear regression. | L1/CO4/2M |
| **6** | | Define ridge & lasso regression | L1/CO4/2M |
| **7** | | What is polynomial regression? | L1/CO4/2M |
| **8** | | Categorize various regression techniques. | L4/CO4/2M |
| **9** | | Which method is used for the best line of fit? | L1/CO4/2M |
| **10** | | Recall multicollinearity in regression analysis. | L1/CO4/2M |
| **Descriptive Questions (Long)** | | | |
| **1** | Explain simple linear regression with suitable example. | | L2/CO4/12M |
| **2** | Illustrate logistic regression in detail with an example. | | L2/CO4/12M |
| **3** | With suitable example analyze method of least squares. | | L4/CO4/12M |
| **4** | List the assumptions in regression analysis. | | L1/CO4/12M |
| **5** | Choose the method to improve accuracy of the linear regression model? | | L3/CO4/12M |
| **6** | Infer the need for polynomial regression using following an example. | | L4/CO4/ |
| **7** | Explain multiple linear regression with the following an example. | | L2/CO4/12M |

**UNIT - V**

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| **S.No.** | **Question** | **[BT Level] [CO][ Marks]** | |
| **2 Marks Questions (Short)** | | | |
| **1.** | Explain the use of unsupervised learning. | L2/CO5/2M | |
| **2.** | List few application areas of unsupervised learning. | L1/CO5/2M | |
| **3.** | List categories of clustering techniques | L1/CO5/2M | |
| **4.** | List various partitioning methods. | L1/CO5/2M | |
| **5.** | Define clade. | L2/CO6/2M | |
| **6.** | Define DBSCAN. | L2/CO6/2M | |
| **7.** | List various methods of hierarchical clustering. | L1/CO6/2M | |
| **8.** | What is a dendrogram? | L1/CO6/2M | |
| **9.** | Compare between DENCLUE and OPTICS. | L3/CO6/2M | |
| **10.** | Compare between k-Means and k-Medoids approaches. | L3/CO5/2M | |
| **Descriptive Questions (Long)** | | | |
| **1** | Distinguish between supervised and unsupervised learning techniques. | L4/CO5/12M | |
| **2** | Explain the concept of clustering with neat diagram. | L2/CO5/12M | |
| **3** | Apply agglomerative hierarchical clustering with a suitable example.  18, 22, 25, 42, 27, 43 | L3/CO6/12M | |
| **4** | Apply DBSCAN algorithm on the given data set | L3/CO6/12M | |
| **5** | Apply k-means algorithm on the data set | L3/CO5/12M | |
| **6** | Explain in detail about DENCLUE clustering technique with an  example. | L2/CO6/ | |
| **7** |  | L3/CO5/12M |
| **8** | Explain OPTICS clustering Algorithm with an example. | L2/CO6/12M |

**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:**