1. A) Least Square Error
2. A) Linear regression is sensitive to outliers
3. B) Negative
4. B) Correlation
5. C) Low bias and high variance
6. B) Predictive model
7. D) Regularization
8. D) SMOTE
9. A) TPR and FPR
10. B) False
11. B) Apply PCA to project high dimensional data
12. A) We don’t have to choose the learning rate, D) It does not make use of dependent variable.
13. In machine learning, regularization is a technique used to prevent overfitting and improve the generalization performance of a model. Overfitting occurs when a model is too complex and learns the noise in the training data, resulting in poor performance on new, unseen data.

Regularization methods add a penalty term to the loss function of the model that controls the complexity of the model. The penalty term is based on the magnitude of the model's parameters, and it encourages the model to have smaller parameter values, effectively shrinking the parameters towards zero. This helps to reduce the model's variance and make it more robust to noise in the training data.

Two common regularization techniques are L1 regularization (also known as Lasso) and L2 regularization (also known as Ridge). L1 regularization adds the absolute value of the parameters to the loss function, while L2 regularization adds the square of the parameters. L1 regularization tends to produce sparse models by setting some of the parameters to zero, which can help with feature selection. L2 regularization tends to produce models with smaller parameter values overall, which can help with reducing the impact of outliers in the data.

14. Linear Regression: L1 regularization (Lasso), L2 regularization (Ridge), Elastic Net regularization.

Logistic Regression: L1 regularization, L2 regularization.
Support Vector Machines (SVM): L2 regularization (C-parameter), L1 regularization (L1-SVM), Elastic Net regularization.
Decision Trees: Tree pruning, which involves removing branches with low information gain or complexity.
Random Forests: Tree pruning, bootstrapping, feature subsampling.
Neural Networks: L1 regularization, L2 regularization, dropout regularization, early stopping, weight decay.
K-Nearest Neighbor (KNN): Distance-based regularization, such as using a kernel function or distance weighting.

15. In linear regression, the error represents the difference between the predicted value (i.e., the value estimated by the linear regression model) and the true value of the target variable. The error is also referred to as the residual, which is calculated as the difference between the observed value of the target variable and the predicted value given by the linear regression equation.