Here are the correct answers to the questions:

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

Question 12:

Correct options:

- A) We don’t have to choose the learning rate.
- B) It becomes slow when the number of features is very large.

Explanation:

- Normal Equation doesn't involve iterative optimization like gradient descent, so there's no need to choose a learning rate.
- It involves matrix inversion, which becomes computationally expensive for large feature sets.

Question 13: Explain the term regularization.

Regularization is a technique used in machine learning to prevent overfitting by adding a penalty term to the loss function. This penalty term discourages model complexity and encourages simpler models that generalize better to unseen data. It helps to reduce variance in model predictions, making them less sensitive to noise in the training data.

Question 14: Which particular algorithms are used for regularization?

Common algorithms that employ regularization include:

- Ridge Regression: Adds a penalty based on the L2 norm of the coefficients, effectively shrinking them towards zero.
- Lasso Regression: Uses an L1 penalty, which can drive some coefficients to exactly zero, performing feature selection as well as regularization.
- Elastic Net: A combination of L1 and L2 penalties, offering a balance between feature selection and coefficient shrinkage.

Question 15: Explain the term error present in the linear regression equation.

In linear regression, the model aims to fit a line to the data points. The error term, often denoted as ε (epsilon), represents the difference between the actual values (y)

and the predicted values (ŷ) on the line. It captures the unexplained variation that the model cannot account for. The goal of linear regression is to minimize this error term to achieve the best possible fit.