1)What is Lasso Regression, and how does it differ from other regression techniques?

Ans- This is a regularization technique used in feature selection using a Shrinkage method also referred to as the penalized regression method. Lasso is short for Least Absolute Shrinkage and Selection Operator, which is used both for regularization and model selection.

Lasso is a modification of linear regression, where the model is penalized for the sum of absolute values of the weights. Thus, the absolute values of weight will be (in general) reduced, and many will tend to be zeros.

2) What is the main advantage of using Lasso Regression in feature selection?

Ans- The main advantage of a LASSO regression model is that it has the ability to set the coefficients for features it does not consider interesting to zero. This means that the model does some automatic feature selection to decide which features should and should not be included on its own.

3) How do you interpret the coefficients of a Lasso Regression model?

Ans- A positive coefficient indicates that as the value of the independent variable increases, the mean of the dependent variable also tends to increase. A negative coefficient suggests that as the independent variable increases, the dependent variable tends to decrease.

4) What are the tuning parameters that can be adjusted in Lasso Regression, and how do they affect the model's performance?

Ans- A tuning parameter (λ), sometimes called a penalty parameter, controls the strength of the penalty term in ridge regression and lasso regression. It is basically the amount of shrinkage, where data values are shrunk towards a central point, like the mean.

5) Can Lasso Regression be used for non-linear regression problems? If yes, how?

Ans- The ordinary lasso penalty has been extensively used in the framework of linear regression models; however, sufficient results have not been obtained for nonlinear regression models with Gaussian basis functions.

Lasso regression is a regularization technique. It is used over regression methods for a more accurate prediction. This model uses shrinkage. Shrinkage is where data values are shrunk towards a central point as the mean.

6) What is the difference between Ridge Regression and Lasso Regression?

Ans- Similar to the lasso regression, ridge regression puts a similar constraint on the coefficients by introducing a penalty factor. However, while lasso regression takes the magnitude of the coefficients, ridge regression takes the square. Ridge regression is also referred to as L2 Regularization.

Lasso will eliminate many features, and reduce overfitting in your linear model. Ridge will reduce the impact of features that are not important in predicting your y values.

7) Can Lasso Regression handle multicollinearity in the input features? If yes, how?

Ans- Another Tolerant Method for dealing with multicollinearity known as Least Absolute Shrinkage and Selection Operator (LASSO) regression, solves the same constrained optimization problem as ridge regression, but uses the L1 norm rather than the L2 norm as a measure of complexity.

8) How do you choose the optimal value of the regularization parameter (lambda) in Lasso Regression?

Ans- The best cross-validation score is obtained for the 0.4 value of lambda. This is your optimal value of lambda. This is how we choose the estimated best model with optimal hyper-parameter values. Use this same process with different types of algorithms like Ridge, LASSO, Elastic-Net, Random Forests, and Boosted trees