**In Q1 to Q8, only one option is correct, Choose the correct option:**

- The computational complexity of linear regression is: A) $O(n^{2.4})$ B) $O(n)$ C) $O(n^2)$ D) $O(n^3)$

- Which of the following can be used to fit non-linear data?
  - Lasso Regression B) Logistic Regression C) Polynomial Regression D) Ridge Regression

- Which of the following can be used to optimize the cost function of Linear Regression?
  - Entropy B) Gradient Descent C) Pasting D) None of the above.

- Which of the following method does not have closed form solution for its coefficients?
  - extrapolation B) Ridge C) Lasso D) Elastic Nets

- Which gradient descent algorithm always gives optimal solution?
  - Stochastic Gradient Descent B) Mini-Batch Gradient Descent C) Batch Gradient Descent D) All of the above

- Generalization error measures how well a model performs on training data.
  - True B) False



- The cost function of linear regression can be given as $J(w, w) = \frac{1}{2n}\sum^{m}(w + w\,x^{(i)} - y^{(i)})^2$.

The half term at start is due to:

$\frac{0}{1}$

$i=1$ 0 1

- scaling cost function by half makes gradient descent converge faster.
- presence of half makes it easy to do grid search.
- it does not matter whether half is there or not.
- None of the above.

- Which of the following will have symmetric relation between dependent variable and independent variable?
  - Regression
  - B) Correlation
  - C) Both of them
  - D) None of these

**In Q9 to Q11, more than one options are correct, Choose all the correct options:**

- Which of the following is true about Normal Equation used to compute the coefficient of the Linear Regression?
  - We don't have to choose the learning rate.
  - It becomes slow when number of features are very large.
  - We need to iterate.
  - It does not make use of dependent variable.

- Which of the following statement/s are true if we generated data with the help of polynomial features with 5 degrees of freedom which perfectly fits the data?
  - Linear Regression will have high bias and low variance.
  - Linear Regression will have low bias and high variance.
  - Polynomial with degree 5 will have low bias and high variance.
  - Polynomial with degree 5 will have high bias and low variance.



- Which of the following sentence is false regarding regression?
  - It relates inputs to outputs.
  - It is used for prediction.
  - It discovers causal relationship.
  - No inference can be made from regression line.

**Q12 and Q13 are subjective answer type questions, Answer them briefly.**

- Which Linear Regression training algorithm can we use if we have a training set with millions of features?

Answer - batch gradient descent, stochastic gradient descent, or mini-batch gradient descent can be used.

- Which algorithms will not suffer or might suffer, if the features in training set have very different scales?

Answer - gradient descent algorithms