SAMPLE QUESTIONS

1) For the given matrix $\begin{bmatrix} 1 & 3 & 7 \\ 4 & 2 & 3 \\ 1 & 2 & 1 \end{bmatrix}$, the sum of all eigen values is
   a) 4
   b) 5
   c) 6
   d) 7

2) While optimizing the objective function $I = x^4$, the obtained optimum is
   a) Maximum
   b) Minimum
   c) Saddle point
   d) None of the above

3) Why gradient descent is preferred over Newton's method for solving machine learning problems?
   a) Gradient descent is derivative based.
   b) Gradient descent can use variable step size.
   c) **Gradient descent does not require matrix inversion.**
   d) All of the above.

4) The progress of the gradient descent is shown in following figure where objective function F(x) is minimized. With respect to given figure, select the most appropriate statement.

$$x_{k+1} = x_k - \alpha \nabla F(x)$$
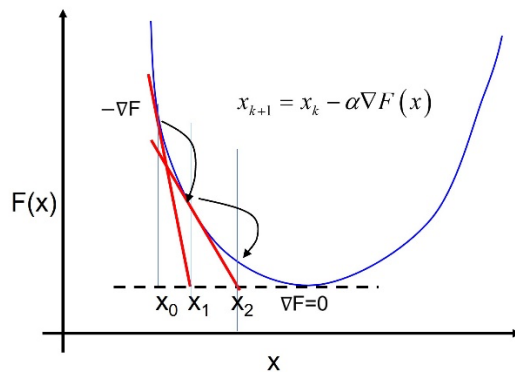
   a) Step size is fixed.
   b) Step size is variable.
   c) Step size is variable and obtained optimally for each step.
   d) None of the above.

5. For the below box plot shows the variability of body of weight of various students in class. If some has got a weight of 60, can it be considered as an outlier?

80

75

70

66
65

60
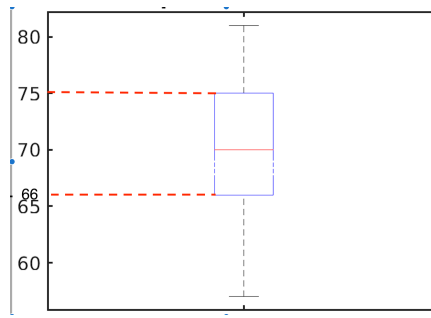
a. Yes
b. No
c. None of these

6. Sample mean tend to follow Normal distribution, no matter how non-normal the underlying population. This is a statement regarding:

A. Central limit theorem

B. Bayes theorems

C. Maximum likelihood estimation

D. None of these.

7. The standard deviation is always _____ than the mean deviation

A. Greater

B. Less

C. Equal

D. None of these

8. Suppose for 40 observations, the variance is 50. If all the observations are increased by 20, the variance of these increased observations will be

A. 50
B. 70
C. 2.5
D. 30

9. The median value for the dataset (12,10,16,8,90,50,30,24) is _____

A. 20

B. 10

C. 30

D. 22

10. For the below data set, what is 45th percentile?

22,28,35,25,29,38,25,30,39,26,33,40

    A. 29
    B. 25
    C. 38
    D. 28