**CBA: Practice Problem Set 2**

**Topics: Sampling Distributions and Central Limit Theorem**

1. Examine the following normal Quantile plots carefully. Which of these plots indicates that the data …
2. Are nearly normal? Ans: c
3. Have a bimodal distribution? (One way to recognize a bimodal shape is a “gap” in the spacing of adjacent data values.) Ans: B
4. Are skewed (i.e., not symmetric)? Ans: A, C, D
5. Have outliers on both sides of the center? Ans: A



1. For each of the following statements, indicate whether it is True/False. If false, explain why.

The manager of a warehouse monitors the volume of shipments made by the delivery team. The automated tracking system tracks every package as it moves through the facility. A sample of 25 packages is selected and weighed every day. Based on current contracts with customers, the weights should have *μ* = 22 lbs. and *σ* = 5 lbs.

1. Before using a normal model for the sampling distribution of the average package weights, the manager must confirm that weights of individual packages are normally distributed.
2. The standard error of the daily average SE() = 1.

Statements and for this statement, we have to show that this statement is true or false. So in the first we are given them an age of warehouse melted, a volume of shipments made in the deliverie terms. So here the tracking of package is given so here for the first statement for the first answered. The answer is true: according to the statement, and here in the second part, in the second statement, the control limit does not affect the. In the second part, the cool limit control limit does not affect the change of of type 2 error. So this statement is the false statement in this third statement. Third statement is also false because it would ignore the risk of risk of type 1 and type 2. In the last force, statement for statement is also false because there will be focused attention of type 1 error ignore and riskovtype 2 error. So here we are given x by controlling, which is in the pound of 22 plus minus 3. So the margin error here is 3, so the standard error is the ratio of sigma divides by the under root of n. Here the value of sigma is given, which is 5, and the value of under root n is given, which is 25 point, so the under root of 25 is 5 point. So here the answer is 1, so the z value is a marginal error divide by the standard error and the marginal error is 3 standard. Error is 1, so here the values 3. So from here we can say that the p of z is greater than 3, which is equal to 0.001. So this is the answer here and due to this f is d: false.

1. Auditors at a small community bank randomly sample 100 withdrawal transactions made during the week at an ATM machine located near the bank’s main branch. Over the past 2 years, the average withdrawal amount has been $50 with a standard deviation of $40. Since audit investigations are typically expensive, the auditors decide to not initiate further investigations if the mean transaction amount of the sample is between $45 and $55. What is the probability that in any given week, there will be an investigation?
2. 1.25%
3. 2.5%
4. 10.55%
5. 21.1%
6. 50%

Ans: D. 21.1%

1. The auditors from the above example would like to maintain the probability of investigation to 5%. Which of the following represents the minimum number transactions that they should sample if they do not want to change the thresholds of 45 and 55? Assume that the sample statistics remain unchanged.
2. 144
3. 150
4. 196
5. 250
6. Not enough information

Ans: E. Not enough information

1. An educational startup that helps MBA aspirants write their essays is targeting individuals who have taken GMAT in 2012 and have expressed interest in applying to FT top 20 b-schools. There are 40000 such individuals with an average GMAT score of 720 and a standard deviation of 120. The scores are distributed between 650 and 790 with a very long and thin tail towards the higher end resulting in substantial skewness. Which of the following is likely to be true for randomly chosen samples of aspirants?
2. The standard deviation of the scores within any sample will be 120.
3. The standard deviation of the mean of across several samples will be 120.
4. The mean score in any sample will be 720.
5. The average of the mean across several samples will be 720.
6. The standard deviation of the mean across several samples will be 0.60

**Ans. The average of the mean across several samples will be 720.**