BMAT 160

TEST #3 – FORMULA SHEET

CHAPTER- 7: ***Probability Distributions***

Expected Value, **E(X):** $E(X) = \sum[x\,P(x)] = x_1 \cdot P(x_1) + x_2 \cdot P(x_2) + \cdots + x_n \cdot P(x_n)$

where, x = each outcome , and p(x) = its corresponding probability

Probability in a Binomial Distribution, P(x): $P(x) = {}_nC_x \cdot p^x \cdot q^{(n-x)}$

where, p = probability of success, and q = probability of a failure. q = 1 – p

Expected Value for a Binomial Distribution, E(X) : E(X) = np

CHAPTER- 8: ***The Normal Distribution***

The Empirical Rule for a Normal Distribution:

1. Approximately 68% of all observations fall within one standard deviation of the mean.
2. Approximately 95% of all observations fall within two standard deviations of the mean.
3. Approximately 99.7% of all observations fall within three standard deviations of the mean.

Normal distributions: $z = \frac{x-\mu}{\sigma}$

where, μ =the mean of the population , and σ = the standard deviation of the population

Confidence Intervals: $\bar{x} - E < \mu < \bar{x} + E$ or $\bar{x} - z \cdot \frac{\sigma}{\sqrt{n}} < \mu < \bar{x} + z \cdot \frac{\sigma}{\sqrt{n}}$

where, $\bar{x}$ = the sample mean, σ= the population standard deviation,
n = the sample size, and z = is the z value for the desired confidence level

Margin of Error, E : $E = z \cdot \frac{\sigma}{\sqrt{n}}$

Commonly used confidence levels and their z-scores:

Confidence Level	Critical Value, Z_C
90%	1.645
95%	1.96
99%	2.576

The minimum Sample Size for a certain margin of error: $n = \left(\frac{z\sigma}{E}\right)^2$