STATISTICS WORKSHEET-9

Q1 c

Q2 b

Q3 b

Q4 b

Q5 c

Q6 a

Q7 c

Q8 b

Q9 c

Q10 c

Q11 a

Q12 b

Q13 The **Z** distribution is a special case of the normal distribution with a mean of **0** and standard deviation of **1**. The **t-distribution** is similar to the **Z-distribution**, but is sensitive to sample size and is used for small or moderate samples when the population standard deviation is unknown. At large samples, the **z** and **t samples** are very similar.

The **t-statistic** is used to test hypotheses about an unknown population mean **u** when the value of σ� is unknown. The formula for the **t statistic** has the same structure as the **z-score formula**, except that the t statistic uses the estimated standard error in the denominator. The only difference between the **t formula** and the **z-score** formula is that the **z-score** uses the actual population variance, σ2�2 (or the standard deviation) and the **t formula** uses the corresponding sample variance (or standard deviation) when the population value is not known. Simply put, the basic difference between these two is that the t statistic uses sample variance **(s ²)** and the z-score uses the population variance $(\sigma 2)(�2)$. To determine how well a **t-statistic** approximates a **z-score**, we must determine how well the sample variance approximates the population variance. Basically, for small samples, the t-statistic is used.

$$Z=X-\mu\sigma t=\bar{x}-\mu 0 s\surd$$

The mean must be known prior to computing the sample variance. This places a restriction on sample variability such that only n-1 scores in a sample are free to

vary. The value **n-1** is called the **degrees of freedom (df)** for the sample variance. Degrees of freedom describe the number of scores in a sample that are free to vary. Because the sample mean places a restriction on the value of one score in the sample, there are **n-1** degrees of freedom for the sample.

Q14 **The t-distribution is a type of normal distribution** that is used for smaller sample sizes. Normally-distributed data form a bell shape when plotted on a graph, with more observations near the mean and fewer observations in the tails.

Q15 The t-distribution describes **the standardized distances of sample means to the population mean when the population standard deviation is not known, and the observations come from a normally distributed population**.