KFUPM Term 121 Date: 17/12/2012

Mathematics & Statistics STAT 319 Duration: 25 minutes

Quiz# 4

Name: ID #: Section 4 Serial #:

***Q*1**. A study of the ability of individuals to walk in a straight line reported the accompanying descriptive summary on cadence (strides per seconds) for a sample of 20 randomly selected healthy men, from MINITAB:

Variable	n	Mean	Median	St. Dev.	SEMean
Cadence	***20***	***0.9255***	***0.9300***	***0.0809***	***0.0181***

where StDev= standard deviation and SEMean= standard error of the mean.

a. Test the claim that population mean is less than 0.95 cadence at $\alpha = 0.04$.

Hypotheses:

Test Ratio:

Critical Value:

Decision Rule:

Decision:

Interpretation: *The data provide sufficient evidence to conclude that*

b. What assumption you needed to perform your test?

***Q*2**. A steel bolt is to be produced *twice* by a production line worker, once by the old machine and again by the new machine to compare the quality of both machines. The thickness, in mm, of steel bolts produced by randomly selected 8 workers is given in the table below:

Worker	1	2	3	4	5	6	7
Old	9.7	9.9	10.3	10.1	10.5	9.4	9.9
New	9.1	10.4	9.8	10.6	10.0	9.8	10.5

a. Find a point estimate for the population mean difference of thickness of bolts produced by the two machines.

b. What is the standard error of the estimate in a before?

c. Find the maximum error of estimation for the true mean difference of thickness of the two machines using a 98% confidence level.

d. Construct a 98% confidence interval estimate for the mean difference of thickness.

***Q*3**. Tensile strength tests were carried out on two different grades of wire rod resulting in the accompanying data:

Grade	Sample size	Sample mean (kg/mm^2)	Sample Std. Dev.
High	**16**	**108**	**1.3**
Low	**16**	**124**	**2.0**

a. Does the data provide compelling evidence for concluding that true average strength for the High grade exceeds that for the Low grade by 10 kg/mm^2? Test the appropriate hypotheses using the *p*–value approach.

b. Estimate the difference between true average strengths for the two grades using 90% confidence interval.

With My Best Wishes