KFUPM | Term 181 | Date: 25/11/2018
Math & Stat Dept. | STAT 319 | Duration: 40 minutes
Class Test #2

Name: ID#: Section #1 Serial

1. If the probability is 0.40 that steam will condense in a thin-walled aluminum tube at 10 atm pressure. Under the stated conditions find

a. The probability that steam will condense for at most 80 of 150 such tubes.

b. The probability that the average proportion exceeds 0.3 for a sample of 50 such tubes.

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2. The following represents a sample of 13 measurements of the time (in minutes) it takes to finish a chemical process.

22 24 25 30 22 20 28 30 24 34 36 15 37

a. Calculate the sample median.

b. Calculate the sample 90^{th} percentile.

c. Construct a boxplot of the times and comment on it.

P.T.O. ➔

3. Thirty automobiles were tested for fuel efficiency (in miles per gallon). The following frequency distribution was obtained

classes	7.5 – 12.5	12.5 – 17.5	17.5 – 22.5	22.5 – 27.5	27.5 – 32.5
f_i	3	5	15	5	2

a. Find the mean of miles per gallon for the thirty automobiles.

b. Find the standard deviation of miles per gallon for the thirty automobiles.

c. Find the probability an automobile will drive more than 22.5 miles per gallon.

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4. To check on an ambulance service's claim that **at least** 40% of its calls are life-threatening emergencies, a random sample was taken from its files' and it was found that only 49 of 150 calls were life-threatening emergencies. Based on the given information above,

a. Construct a 97% confidence interval for the true percentage of calls that are life-threatening emergencies.

b. Would you accept the above claim at 3% level of significance? Use the critical value approach.

With My Best Wishes

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1. A wire-bonding process is said to be in control if the mean pull strength is 10 pounds. It is known that the pull-strength measurements are **normally distributed** with a standard deviation of 1.5 pounds. Periodic random samples of size 4 are taken from this process and the process is said to be ***out of control*** if a sample mean is **less than** 8 pounds.

a. What is the probability that the wire-bonding process is still under control?

b. What sample mean has only 4% of the wire-bonding process is out of control?

2. The number of calls received per day by a telephone answering machine is a **Poisson** random variable with **mean** 144.

a. What is the probability that, in one day, the answering machine receives more than 150 calls?

b. In 40 randomly selected days, what is the probability that, on average, the number of received calls will not exceed 130?

P.T.O. ➔

3. The tensile strength (measured in psi) of a certain brand of polythene sheet can be modelled by a **normal distribution**.

a. How many sheets of polythene must be drawn if you wish a 99% confidence interval for the population mean to be [33 , 37] and the strength variance is 16 psi^2?

b. If a sample of 20 sheets is randomly selected, test the claim that the tensile strength of that brand of polythene is less than 36 at 3% level of significance? Use the *p*-value approach.

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4. The following stem-and-leaf shows the weights of a sample of 25 people in kg

Freq	Stem	Leaf
3	4	3 4 7
7	5	1 2 3 5 7 7 9
9	6	1 2 2 4 5 6 8 8 8
3	7	2 5 8
2	8	0 4
1	9	0

a. Compute the mode of the weights.

b. Compute the normal score of the weight 90.

c. Is there any outliers in the weights? Justify your answer.

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