ECON 315: QUANTITATIVE TECHNIQUE II

INSTRUCTIONS

(i) Answer Question 1 and any other Two
(ii) Do not write on the question paper
(iii)Show your working clearly

Question One

a) The weekly wages of 2000 workmen are normally disributed with a mean wage of ksh 60 and wage standard deviation of Ksh 5. Estimate the number of workers whose weekly wages are:-

i. Ksh 59 and 64 **(3 marks)**
ii. Less than Ksh 55 **(3 marks)**

b) Kenya Pharmacy limited has been selling a drug in the Kenyan market and claims that the drug relieves fever for 64% cases. A test on a random sample of 880 patients showed that the fever was relieved in 540 cases. By testing the hypothesis, check if the company's claim may be validated at 10% level of significance? **(10 marks)**

c) Given the following information on sales of cars by a given sales lady per day:

No. of cars sold	Probability
0	0.10
1	0.14
2	0.18
3	0.22
4	0.11
5	0.15

i. What kind of distribution is this? Give a reason **(2 marks)**
ii. How many cars does this sales lade sale on a typical day? **(8 marks)**
iii. What is the variance of the sales? **(4 marks)**

Question Two

a) Explain the qualities of a good estimator. **(4 marks)**

b) Suppose Mombasa University has bought 6000 bulbs and the life time of the bulbs has historically been to be normally distributed with mean of 700 hours and a standard deviation of 130 hours. How many bulbs are expected to fail in the first 550 hours. **(8 marks)**

c) A machine that produces laptops sometimes malfunctions with 5% defects in a day. Both defective and non defective laptops proceed from the same line. If 8 laptops are drawn at random, find the probability that three of them are defective. **(8 marks)**

stion Three

Explain when each of the following test statistics are applied **(12 marks)**

i. F- statistics

ii. t – statistics

iii. Z-statistics

iv. χ^2 - statistcs

a) A study carried out a few years ago on the rise in the cost of hourly training in counselling using 150 observations yieleded the following confidence interval:

Ksh. 270<Ц<Ksh.310

Calculate the values of standard deviation, s, and mean, x, used to construct this confidence interval. **(8 marks)**

Question Four

a) A committee of four must be chosen from four women and five men. Calculate
   i. In how many ways the committee must be chosen **(4 marks)**
   ii. In how many ways two men and two women can be chosen **(4 marks)**

b) Explain the two types of errors in hypothesis testing **(4 marks)**

c) Mr X, a salesman in industrial chemical, had sales of Ksh 200,000. The industrial chemical department had a mean sale of ksh 120,000 and a standard deviation of ksh 40,000. On the other hand , Babu, a sales person in office supplies department had sales of Ksh 100,000.The office supplies department had a mean sales of Ksh 40,000 and a standard deviation of Ksh 20,000.Compare their performance. **(8 marks)**

Question Five

a) An advertising company estimates, historically, its monthly sales to have averaged Ksh.36 million per depot with a standard deviation of Ksh.10 million. As a result of a sharp rise in competition from similar firms, a random sample of 36 depots was taken this year and gives mean sales of Ksh.32 million. Test if the company has significantly lost sales? **(10 marks)**

b) In a sample of 200 livestock where a particular devise was selected, 100 were given a drug and the others were not given any drug. The results are as follows

	Drug	No drug	Total
Cured	65	55	120
Not cured	35	45	80
Total	100	100	200

Test whether the drug will be effective or not, at 5% level of significance. **(10 marks)**

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