

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF
ECONOMICS**

ECON 235: ECONOMICS STATISTICS II

STREAMS:

TIME: 2 HOURS

DAY/DATE: THURSDAY 21/4/2023

11.30 A.M. – 1.30 P.M.

INSTRUCTIONS:

Answer Question ONE and any other TWO Questions

Do not write anything on the Question paper

Question One

- a) Explain the meaning of the following terms:
- i) Discrete random variable (1 mark)
 - ii) Correlation (1 mark)
 - iii) Sampling distribution (1 mark)
 - iv) Mutually exclusive events (1 mark)
 - v) Level of significance (1 mark)
- b) A graduate applies for a job in two firm X and Y. The probability of him being selected in firm X is 0.7 and being selected by firm Y is 0.5. The probability of at least one of his applications being rejected is 0.6. What is the probability that he will be selected in one of the firms? (3 marks)
- c) A workshop produces 2000 units per day. The average weight on units is 130kg with a standard deviation of 10kg. Assuming normal distribution, how many units are expected to weigh less than 142kg? (3 marks)

- d) The distribution of typing mistakes committed by a typist is given below. Assuming a Poisson model, find out the expected frequencies (8 marks)

Mistakes per page	0	1	2	3	4	5
Number of pages	142	156	69	27	5	1

- e) Car Stereo of manufacturer A have mean lifetime of 1400 hours with a standard deviation of 200 hours, while those of manufacturer B have a mean lifetime of 1200 hours what a standard of 100 hours. If random sample of 125 stereos of each manufacturer are tested, what is the probability that the manufacturer A stereos will have a mean lifetime which is at least
- 160 hours more than the manufacturer B stereos. (3 marks)
 - 250 hours more than the manufacturer B stereos. (3 marks)
- f) You are given the following data about the life of two brands of bulbs:

	Mean Life in Hours	Standard Deviation in hours	Sample size
Brand A	2,000	250	12
Brand B	2,230	300	15

Do you think there is significant difference in the quality of the two brands of bulbs?

(5 marks)

Question Two

- a) Use of chi-square test to test if the two attributes are independent. Take $\alpha = 5\%$.

(8 marks)

	Training		
	Intensive	Good	Average
Above Average	100	150	40
Average	100	100	100
Poor	50	80	150

- b) Out of 20,000 customers' ledger accounts, a sample of 600 accounts was taken to test the accuracy of posting and balancing wherein 45 mistakes were found. Assign limits within the number of defectives cases can be expressed at 5% level of confidence. (4 marks)

- c) A random sample is selected from each of three makes of rope and their breaking strength (in sh) are measured with the following results:

I	II	III
70	100	60
72	110	65
75	108	57
80	112	84
83	120	87
	107	73

Test, whether the breaking strength of the ropes differ significantly. (8 marks)

Question Three

- a) Explain the properties a good estimator. (4 marks)
- b) The following table gives the number of refrigerators sold by four salesmen in three months.

Month	Salesmen			
	A	B	C	D
May	50	40	48	39
June	46	48	50	45
July	39	44	40	39

Required:

- i) Determine, whether there is any significant difference in the average sales made by four salesmen. (8 marks)
- ii) Determine, whether the sales differ with respect to different months. (8 marks)

Question Four

- a) A random sample of 200 consumer accounts at a large brokerage firm is selected for the purpose of estimating the mean number of transactions per year for each customer. The sample mean is 12. Determine 99% confidence interval for the mean number of transactions of all consumer accounts of the firm. (4 marks)

- b) In trying to evaluate the effectiveness in its advertising campaign, a firm compiled the following information:

Year	2011	2012	2013	2014	2015	2016	2017	2018
Advertisement Expenditure (sh."000")	12	15	15	23	24	38	42	48
Sales (sh)	5.0	5.6	5.8	7.0	7.2	8.8	9.2	9.5

Required:

- i) Calculate the regression equation of sales on advertising expenditure. (10 marks)
- ii) Estimate the probable sales when advertisement expenditure is sh. 60 thousand.
(2 marks)
- iii) Compute the coefficient of correlation. (4 marks)

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