

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR AWARD OF DOCTOR OF PHILOSOPHY IN BUSINESS ADMINISTRATION

DBAM 901: STATISTICS FOR RESEARCHERS

STREAMS: Ph.D (BUSINESS ADMINISTRATION)

TIME: 3 HOURS

DAY/DATE: TUESDAY 13 /07/ 2021

2.30 PM – 5.30 PM

INSTRUCTIONS:

Answer ANY Three Questions

QUESTION ONE [20 MARKS]

a) Distinguish the following terms as used in Statistics

- | | |
|---|-----------|
| i. Descriptive and inferential statistics | [2 marks] |
| ii. Type I and Type II errors | [2 marks] |
| iii. Quantitate and Qualitative Data | [2 marks] |

b) The following table shows the distribution of masses of 40 logs of wood in a particular Town

Mass(Kg)	20-29	30-39	40-49	50-59	60-69	70-79	80-89
Frequency	6	5	7	10	5	4	3

Required

- | | | |
|------------|--------------------------|-------------------------------|
| (i). Mean | (iii). Median | (v). Coefficient of Variation |
| (ii). Mode | (iv). Standard Deviation | |

[10 marks]

- c) The following data shows the annual sales reported by the three firms over a period of four years

	Sales (Kshs Millions)		
	Bidco Africa Ltd	Uniliver Ltd	Pwani oil Ltd
2009	250	150	250
2010	200	180	200
2011	150	200	150
2012	200	250	150

Required

Present the above information in a multiple bar Chart

[4 marks]

QUESTION TWO [20 MARKS]

- a) Outline 5 steps in Hypothesis testing

[5 marks]

- b) The advisor of Statistics club of a large college believes that the group consists of 10% freshmen, 20% sophomores, 40% juniors and 30% seniors. The membership for the club this year consisted of 14 freshmen, 19 sophomores, 51 juniors and 16 seniors. At $\alpha = 10\%$ test the advisors conjecture.

[5marks]

- c) A market segmentation survey was conducted to test the model of rowing machine and the type of customer purchasing it as shown below.

		Customer type		
		Practical	Impulsive	Total
Rowing machine	Basic	22	25	47
	Designer	13	88	101
	Complete	54	19	73
	Total	89	132	221

Required

Use Chi-square (χ^2) test at 5% significance level to find out if the model of rowing machine purchased is associated with type of customer.

[10 marks]

QUESTION THREE [20 MARKS]

- a) Outline 4 importance of regression analysis in Statistics/Management science [4 marks]
- b) The demand and prices (in Kshs. thousands) for a bag of a hybrid 100kg bag of wheat in different regions of the country is as shown below.

Price(X)	56	60	62	65	70	80	90
Demand (Y)	138	148	150	156	153	160	173

Required

- (i) Fit a least square regression line ($Y=c+mX$) [8 marks]
- (ii) Suppose that you found a bag in one of the shops of the same kind of wheat costing Kshs 58,000, what would you approximate its demand in that area to be? [2 marks]
- (iii) Compute Pearson product moment correlation coefficient and make comment [6 marks]

QUESTION FOUR [20 MARKS]

- (a) A businessman who is almost bankrupt is trying to sell his business. He claims that the mean daily returns from the business is at least USD 4500. A prospective buyer conducts his own investigation and finds that during the next 20 days the mean return is USD 4300 with standard deviation of USD 400. Is there enough evidence to reject the businessman claim at 5% significance level [10 marks]

- (b) Two random samples taken from two normal populations are as follows

sample I	20	16	26	27	23	22	18	24	25	19		
Sample II	17	23	32	25	22	24	28	18	31	33	20	27

Estimate the variances of the populations and test whether the two populations have equal variance at 5% level of significance. [10marks]

QUESTION FIVE [20 MARKS]

- a) Briefly distinguish between Regression and correlation analysis [4 marks]
- b) The following is a regression output on advertisement expenditure and sales of a certain firm in Kenya.

	<i>Coefficient</i>	<i>Std .Error</i>	<i>t- statistic</i>	<i>p-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
<i>Intercept</i>	65.71	27.73	2.37	0.033	4.67	126.74
<i>Advertising</i>	48.98	10.66	4.60	0.000	25.52	72.44
<i>Promotions</i>	59.65	23.63	2.53	0.024	7.66	111.65
<i>Competitors sales</i>	-1.84	0.81	-2.26	0.040	-3.63	-0.047
<i>R²=0.833</i>						
<i>Adjusted R²= 0.787</i>						
<i>F-statistic=18.290(0.000)</i>						

Required

Write a report on multiple regression function and interpret the results [10 marks]

- c) The time taken to complete jobs of a particular type is known to be normally distributed with a mean of 6.4 hours and standard deviation of 1.2 hours. What is the probability that randomly selected job of this type takes;
- Less than 6 hours [2 mark]
 - Between 6 and 7 hours [2 marks]
 - More than 7 hours [2 marks]