

KABARAK



UNIVERSITY

EXAMINATIONS

2008/2009 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF COMMERCE

COURSE CODE: BMGT 220

COURSE TITLE: BUSINESS STATISTICS II

STREAM: Y2S2

DAY: FRIDAY

TIME: 11.00-1.00 P.M

DATE: 19/12/2008

INSTRUCTIONS:

- 1. Answer question ONE and any other TWO questions.**
- 2. Question one carries 30 marks while the rest carry 20 marks each.**
- 3. Illustrate where possible**

PLEASE TURN OVER

1. a) Distinguish between the following paired concepts:
- i) Type I error and type II error **(3 Marks)**
 - ii) Consistency and efficiency of an estimator **(3 Marks)**
 - iii) Mean and Expected value **(3 Marks)**
 - iv) Discrete probability distribution and continuous probability distribution **(3 Marks)**
 - v) Coefficient of determination and correlation coefficient **(3 Marks)**
- b) What is literature review? Explain its importance as a phase in research **(4 Marks)**
- c) One hundred tickets are being sold in a draw in which you hold one ticket. The first prize is Kshs. 10, the two second prizes are each Kshs. 4 while ten third prizes are each Kshs. 1
- i) What is your expected value? **(4 Marks)**
 - ii) Is it a fair lottery **(2 Marks)**
 - iii) If the ticket is costing 25 cts, should you participate **(1 Mark)**
- d) i) What is permutation **(2 Marks)**
- ii) Suppose there are eight machines available but only three spaces on the floor of a machine shop for the machines are left. In how many different ways can eight machines be arranged in the three available spaces. **(3 Marks)**
- iii) In how many ways can the machines in d(ii) above be combined in threes **(3 Marks)**
2. a) A random sample of 36 construction workers has a daily wage of Kshs. 130. Could this sample have been drawn from a population normally distributed about a mean of Kshs. 120 with a standard deviation of Kshs. 12? **(6 Marks)**
- b) In a random sample of 199 audit partners in Kenya's accounting firms, 104 sample members indicates some level of agreement with the statement: "Cash flow from operations is a valid measure of profitability". Test at the 10 percent level of significance against a two sided alternative the null hypothesis that one half of the members of this population would agree with the statement. **(7 Marks)**
- c) i) What is Bayes' Theorem? **(2 Marks)**
- ii) Suppose that five men out of 100 and 25 women out of 1000 are colour blind. A colour blind person is chosen at random. What is the probability of his being a male (assuming that males and females are in equal proportion)? **(5 Marks)**

3. a) What is binomial distribution **(2 Marks)**
- b) Based on recent experience, 5 percent of the worm gears produced by the Kicomi factory are defective.
- i) Generate the probability distribution for six selected gears **(6 Marks)**
- ii) What is the probability that zero gears will be defective, exactly five gears are defective. **(2 Marks)**
- iii) Find the mean and the variance of the distribution **(2 Marks)**
- c) i) Explain the origin of normal distributions. **(2 Marks)**
- ii) Two hundred employees of a certain company have an average annual wage of Kshs. 15,000 with a standard deviation of Kshs. 2,500. The wages are normally distributed. How many employees earn between Kshs. 10,000 and Kshs. 20,000? **(6 Marks)**

4. a) What is correlation? **(2 Marks)**
- b) The following data shows the ages in years of ten husbands and their wives at marriage:

Husbands' ages: 23 27 28 29 30 31 33 35 36 39

Wives' ages: 18 22 23 24 25 26 28 29 30 32

- i) Calculate and interpret the correlation coefficient **(6 Marks)**
- ii) Test for the significance of this coefficient **(2 Marks)**
- c) i) What are the characteristics of the chi-square distribution? **(3 Marks)**
- ii) Two research workers classified some people in income groups on the basis of sampling studies and their results were:

Investigators	Income groups		
	Poor	Middle	Rich
A	160	30	10
B	140	120	40

Using the chi-square statistic, test whether the sampling techniques used by the research workers are similar (use 5% level) **7 Marks)**

5. a) Explain any five classical assumptions of the least squares estimators (OLS) **(5 Marks)**

- b) As a result of the declining sales, a firm's management decides to determine if advertisement could be used as a policy to arrest the trend. The data on the level of sales and the number of advertisements were collected to establish their relationship. The following data was generated.

TV adverts/day	Sales
4	13
5	16
6	18
7	18
8	26
9	22
9	28
10	26
11	32
12	28

- i) Plot a scatter diagram for the relationship **(2 Mark)**
- ii) Determine the equation of the least squares regression line **(6 Marks)**
- iii) Interpret the results **(1 Mark)**
- iv) Predict sales if there are 20 adverts. Is it acceptable to make such a prediction **(2 Marks)**
- v) Calculate and interpret the coefficient of determination **(2 Marks)**
- vi) Calculate the advertising elasticity of sales and comment. What happens if advertisements are raised by 10% **(2 Marks)**
- vii) From elasticity, is advertisement a policy variable **(1 Mark)**