



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations for 2015/2016 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF MATHEMATICS AND STATISTICS

FIRST SEMESTER EXAMINATION FOR DEGREE IN BACHELOR OF ARTS

ACU 201: INTRODUCTION TO STATISTICS IN SOCIAL SCIENCES

DATE: 12/8/2016

TIME: 2.00-4.00 PM

INSTRUCTIONS:

Answer Question One and Any Other Two Questions

QUESTION ONE (30 MARKS)

- (a) Explain the meaning of the following terms as applied in Statistics
- (i) Population
 - (ii) Sample
 - (iii) Variable
 - (iv) Data (4 marks)
- (b) Differentiate between each of the following terms:
- i) Descriptive and inferential statistics
 - (ii) Nominal and interval measurement
 - (iii) Point and interval estimation (6 marks)
- c) The following frequency distribution the lower quartile is 44.5. Determine the values of a and b .

<u>CLASS</u>	<u>FREQUENCY</u>
30 – 34	7
35 – 39	12
40 – 44	a
45 – 49	b
50 – 54	38
55 – 59	15
60 – 64	8
	$\Sigma f = 200$

- d) A college collects the following set of data on the number of credits C that a randomly selected group of students carry and the number of hours H that they work during the week

- e) A study of 50 randomly chosen 6-year olds shows that they watch television an average of 38 hours per week with standard deviation of 6.4 hours. Determine a 99% confidence interval for the average time such children watch television.

- (a) Explain the meaning of the following sampling techniques:-

- Random sampling
- Stratified sampling
- Judgmental sampling
- Cluster sampling

- (b) A study is conducted to determine the relationship between a student's height and shoe size. The following set of data pairs is obtained

- (i) Determine the equation of the regression line relating height to shoe based on this sample.

- (ii) Use the equation on (i) above to predict the most likely shoe size for a person who is 70 inches tall

QUESTION THREE

The data below shows the number of hours worked in one week by employees in certain company

46.3 39.2 44.2 41.3 45.1 42.3 43.5 40.0
45.6 40.6 42.0 42.6 45.6 39.5 43.1 39.7
46.1 38.9 42.4 42.1 45.0 44.4 42.4 40.8

- (a) Tabulate a frequency distribution table with class intervals by 38.9 – 40.4, ... etc (6 marks)
- (b) Use the table in 2(a) above to calculate the:
- (i) quartile deviation (6 marks)
 - (ii) mode (4 marks)
 - (iii) median (4 marks)

QUESTION FOUR

- (a) A small company is interested in analyzing the effects of advertising on its sales. Over a 5-month period the results are as follows

Money spend on advertising (sh. 000')	Total sales (sh. '000')
5	6
8	15
10	20
15	30
22	39

Calculate the correlation coefficient between sales and advertising. (10 marks)

- (b) The following table shows the number of household members in certain town in 2010.

No of House hold Members	Percentage
1	18
2	32
3	20
4	19
5	7
6 or more	4

- (i) Calculate the mean and standard deviation of the number of households. (5 marks)
- (ii) Assuming the data is based on a single random sample of 445; calculate a 95% confidence interval for the mean household size. (5 marks)

QUESTION FIVE

- (a) The result of an experiment is a discrete random variable which has the binomial distribution with mean 1.2 and variance 1.08.
Calculate the value of the sample size and the probability ($x \leq 1$) (10 marks)
- (b) A small firm has 10 personal computers. The probability that any one of them will require repair on a given day is 0.12. Determine the probability that:
- (i) Exactly 3 computers (3 marks)
 - (ii) At most 2 computers (3 marks)
 - (iii) At least 4 computers will require repair (4 marks)