MACHAKOS UNIVERSITY

University Examinations for 2018/2019 Academic Year

SCHOOL OF BUSINESS AND ECONOMICS

DEPARTMENT OF ECONOMICS

THIRD YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF ECONOMICS AND FINANCE

EES 301: STATISTICS FOR ECONOMISTS II

DATE: 23/4/2019 **TIME: 2:00 – 4:00 PM**

INSTRUCTIONS:

- **(i) Answer question one (Compulsory) and any other two questions**
- **(ii) Do not write on the question paper**
- **(iii) Show your working clearly**
- **(iv) Where α has not been given, use α=0.05**

QUESTION ONE (COMPULSORY) (30 MARKS)

a) Define the following terms as applied in statistics. Give examples (8 marks)

i) Discrete probability distribution

ii) Continuous probability distribution

iii) Uniform probability distribution

iv) A Random variable

b) Recall that a sampling distribution of the sample means that it is normally distributed if it is taken from a normal population. However, in many instances, the population is not normally distributed. In such cases, we apply the central limit theorem. State the central limit theorem (2 marks)

c) The marketing department at Machakos University plans to install new equipment which will improve the efficiency of their operations. It has been found that the average telephone message is 150 seconds, with a standard deviation of 15 seconds. Before they can decide if such an investment would be cost effective, they require you to determine the probability that the mean of a sample of 35 calls will be:

i) Between 145 and 150 (2 marks)

ii) Between 145 and 155 (2 marks)

iii) Greater than 155 (2 marks)

d) Differentiate between a point estimate and an interval estimate. Use appropriate examples (4 marks)

e) If a bank receives on average 6 bad cheques per day, what is the probability that it will receive 4 bad cheques on any given day? (4 marks)

f) State and explain two types of error in statistics (4 marks)

g) State two characteristics of error term (2 marks)

QUESTION TWO (20 MARKS)

a) Discuss the characteristics of a good estimator (8 marks)

b) Explain (use symbols) the difference between mathematical and statistical models (4 marks)

c) State three characteristics of chi square distribution and highlight three circumstances when it can be applied (6 marks)

d) Mention two cases where permutations can be applied (2 marks)

QUESTION THREE (20 MARKS)

a) Differentiate between descriptive statistics and inferential statistics. (4 marks)

b) What do you understand by the term sample distribution of the mean (2 marks)

c) A supervisor has six workers with the following job experiences; 2, 4, 6, 6, 7, 8 with a mean of 5.5. Four workers are chosen randomly for different shifts and their means of experience recorded.

i) Determine the number of shifts (2 marks)

ii) Generate the samples and compute their respective means (4 marks)

iii) Generate the proportion distribution of the means (4 marks)

iv) Calculate the mean and variance (4 marks)

QUESTION FOUR (20 MARKS)

a) State any two characteristics of probabilities (2 marks)

b) What are the main assumptions about the error term (4 marks)

c) Discuss the five essential steps or procedures of hypothesis testing (10 marks)

d) State the significance of the error term (4 marks)

QUESTION FIVE (20 MARKS)

a) A census of retail shop in a particular month revealed that the mean monthly sales was Kshs 2500. A random sample of 16 shops taken in the following month had mean monthly sale of Kshs 2660 and a standard deviation of Kshs 480. Can we conclude that the mean monthly sales have increased since census? (5 marks)

b) A random sample is distributed about the mean, μ with a variance of 48mm. A random sample of 13 observations taken in the past gave a sample variance of 52mm. Can this outcome be attribute to chance or can it be taken as evidence that variability has risen? (5 marks)