MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2013/2014

FIRST YEAR SECOND SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE (AGRICULTURAL ECONOMICS) WITH INFORMATION TECHNOLOGY

(MAIN - CAMPUS)

AEG 114: STATISTICS FOR ECONOMISTS

Date: *23rd July 2014* ***Time:*** *11.00 – 1.00 pm*

INSTRUCTIONS:

- Answer THREE questions. Question ONE is Compulsory.

AEG 114 STATISTICS FOR ECONOMISTS

INSTRUCTIONS. ANSWER THREE QUESTIONS. Question one is compulsory

1. a. In a class of 20 children , 4 of the 9 are boys and 3 of the 11 girls are in the athletics team. A person from the class is selected to be in the egg and spoon race on the sports day. Find the probability that the person chosen is in the athletes team and a

   i. female **3 MARKS.**

   ii. A female member of the athlete team **3 MARKS.**

   iii. a female or in the athletie team **4 MARKS.**

   B. The time taken by a milkman to deliver milk in Kisumu town is normally distributed with a mean 12 minutes and a standard deviation of 2 minutes. He delivers milk daily. Estimate the number of days in the year he takes

   i. longer than 17 minutes **4 MARKS.**

   ii. less than 10 minutes **3 MARKS.**

   iii. between 10 and 13 minutes **3 MARKS.**

2. a. The heights of female students is normally distributes with a a mean of 174 cm and a standard deviation of 6cm.

   i. given that 80% of the female students have a height of h cm, find the value of h **2.5 MARKS**

   ii. given that 60% of the female students have a height greater than s, determine the value of s **2.5 MARKS**

   b. A six sided die has faces labeled 1,3,5,7,9,and 11. It is biased so that the probability of obtaining a number is proportional to the R

   i. Show that the probability distribution is given by $P(R = r) = \frac{r}{36}$ where r= 1,3,5,7,9,11. **5 MARKS.**

   ii. The die is to be rolled and a rectangle of sides 6cm and r 6cm drawn. Calculate the area of the rectangle **5 MARKS.**

   iii. The die is to be rolled and a square of sides $24R^{-1}$cm. Calculate the perimeter of the square. **5 MARKS.**

3. A continuous variable X has a p.d.f f(x) where

$$f(x) = \begin{cases} K(x+2)^2 & -2 \le x \le 0 \\ 4k & 0 \le x \le 1\frac{1}{3} \\ 0 & \text{otherwise} \end{cases}$$

   i. find the value of k **4 MARKS.**

   ii. sketch y=f(x) **4 MARKS.**

   iii. find p(-1≤x≤1) **4 MARKS.**

   iv. find (x>1) **3 MARKS.**

4. Your muffler factory claims to manufacture mufflers with a lifespan of more than 10,000 miles of usage. A consumer group tests this claim at the 95% significance level, and finds that a sample of 64 mufflers have a mean lifespan of 10,002 miles, with a standarddeviation of 10 miles.

Test the following alternate hypotheses using this data, and interpret the results:
(a) Manufacturer's hypothesis: H_a: $\mu > 10{,}000$ **(5 MARKS).**
(b) Consumer group's hypothesis: H_a: $\mu < 10{,}000$ **(5 MARKS).**
(c) If the manufacturer wanted to state that the survey proved their claim to be true, what should $\bar{x}$ have been? **(5 MARKS).**
(d) If the consumer group wanted to state that the survey proved the manufacturer's claim to be false, what should $\bar{x}$ have been? **(5 MARKS).**