



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2017/2018

FIRST SEMESTER EXAMINATION FOR THE DEGREE OF MASTER OF ECONOMICS

EES 814: STATISTICS FOR AGRICULTURE

DATE: Friday 24th November, 2017

TIME: 2.00 p.m. - 5.00 p.m.

INSTRUCTIONS: Answer ALL questions

QUESTION ONE

- a. Six truck models are rated on a scale of 1 to 10 by two companies that purchase entire fleet of trucks for industrial use. Calculate the Spearman rank correlation coefficient and determine at 5% level if the rankings are independent.

Model	1	2	3	4	5	6	7
Rating by first company	4	3	1	2	7	6	5
Rating by second company	3	4	2	5	6	1	7

(10 Marks)

- b. Over a 12 day period, Gladys Glucose sold 4, 11, 5, 7, 10, 13, 12, 5, 9, 6, 2 and one gallons of vanilla, and 19, 4, 6, 8, 18, 17, 17, 15, 3, 16, 14 and 0 gallons of chocolate. Using Man-Whitney U test, can she conclude that she sells the same amount of both flavors on the average?

(10 Marks)

QUESTION TWO

- a. 12 persons were appointed in clerical position in an office. Their performance was noted by giving a test and the marks recorded out of 20. They were given 3 month's training and again they were given another test and their marks recorded out of 25. The employees' performance was not normally distributed.

Employees	A	B	C	D	E	F	G	H	I	J	K	L
Before training	14	15	13	17	18	16	15	19	20	16	14	13
After training	15	14	16	18	17	15	19	19	20	16	15	14

Can it be concluded that the training has improved the performance of the employees?

Proof your answer

(10 Marks)

- b. The following data is given on the aggregate consumption and the national income of an utopia economy for the stated period.

Year	n	Yi (in billion of shillings)	Xi (in billion of shillings)
1988	1	102	114
1989	2	106	118
1990	3	108	126
1991	4	110	130
1992	5	122	136
1993	6	124	140
1994	7	128	148
1995	8	130	156
1996	9	142	160
1997	10	148	164
1998	11	150	170
1999	12	154	178

Find the regression equation for the estimated consumption, interpret the coefficients and predict consumption if the income (X_i) is sh 172 billions. Calculate goodness of fit of the model and inteprete the result (15 Marks)

QUESTION THREE

a) Distinguish between the following concepts.

- (i) Marginal and joint probability (2 Marks)
- (ii) Independent and Mutually exclusive events (2 Marks)

b) In 2016 there were 37 Jubilee senators in the Kenya senate, 16 of whom supported the devolution of all Agricultural services. 20 of the 25 Cord senators supported the said devolution. The remaining 5 senators, of whom 3 supported devolution, were neither Jubilee nor Cord. 2 senators were to be chosen at random without replacement to serve in an advisory capacity regarding devolution of Agricultural matters. Find the following probabilities:

- (i) The probability that both favor devolution (2 Marks)
- (ii) The probability that only one senator favors devolution (2 Marks)
- (iii) The probability that both are Cord senators who favours devolution (2 marks)
- (iv) If only one senator is selected at random, find the probability that he or she favours devolution given that he is Jubilee senator (3 Marks)
- (v) If only one senator is selected at random, find the probability he or she is a Cord senator who favors Devolution (2 Marks)

QUESTION FOUR

- a) Explain the concept of sampling bias as used in Agricultural statistics and discuss any five causes of this bias in the agricultural research (7 Marks)
- b) Define the term scientific decision making process and highlight the steps that the decision maker will follow before a decision can be made (7 Marks)
- c) Distinguish between decision making under certainty and under an uncertainty and identify any two methods under each (6 Marks)