



W1-2-60-1-6

JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY
UNIVERSITY EXAMINATIONS 2017/2018
THIRD YEAR FIRST SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF
SCIENCE IN LANDSCAPE RESOURCE & PLANNING
AHS 2307: EXPERIMENTAL DESIGN

DATE: AUGUST 2018

TIME: 2 HOURS

SECTION A -ANSWER ALL QUESTIONS IN THIS SECTION (Total Marks Section A & B = 70)

- Q1a) Show the randomization and layout for a split-plot design with 5 levels of fertilizer and 4 groundnut varieties arranged according to a RCBD with 4 replications. The varieties are of secondary importance. (5 marks)
- b) The weight of 9 pawpaw fruits from an irrigation study are:
25, 21, 28, 23, 30, 25, 27, 24, 26,
Calculate the mean, standard deviation, variance, and the Confidence Limits at 95% (5 marks)
- c) What is sampling design? Give detailed examples. (5 marks)
- d) A researcher is studying the results of a cross between two bean varieties, yellow pod and white pod, with an expectation of a 3:1 ratio segregation in the F₂. Out of an F₂ population of 500 pods, he counts 386 yellow pods and 114 white pods.
Is the difference between the observed and expected ratio significant at the 5% level? (5 marks)
- Q2a) Is interaction useful in interpretation of experimental results? Explain, using illustrations. (5 marks)
- b) Discuss 4 types of competition effects in field experiments. (5 marks)
- c) Discuss:
i) planned and unplanned comparisons. (2 marks)
ii) three uses of the χ^2 test. (3 marks)
- d) The height of bamboo grown next to a river bed and on a hill top in meters is:
River bed: 23 27 26 21 30 29
Hill top: 32 35 31 30 37 36 41
Calculate the S^2 , S, df and t (at 5% and 1% levels). Of the two environments which one would you recommend for tall bamboo? (5 marks)

SECTION B - ANSWER ANY TWO QUESTIONS IN THIS SECTION

Q3) An adaptability trial with 4 arrowroot hybrids and a local non hybrid control

Row	Yield in kg/plot				Row total
	Column 1	Column 2	Column 3	Column 4	
1	55(A)	55(D)	57(C)	50(B)	
2	46(B)	58(A)	56(D)	58(C)	
3	59(D)	49(C)	47(B)	52(A)	
4	53(C)	52(B)	48(A)	44(D)	
Column total					
Grand total					

Complete the ANOVA table for this data at 5% level. (15 marks)

Q4) Butchers in Juja were classified according to level of education and inclination to have meat inspected before sale:

Inspection Inclination	Education			Total
	Low	Moderate	High	
Low	22	31	34	
Moderate	27	29	28	
High	33	24	26	
Total				

Is the inclination to have meat inspected independent of level of education? Use the 5% level of significance. (15 marks)

Q5) A factorial experiment in RCBD with 3 replications was carried out to test weight gain in 3 Water Buck species under 5 types of feed supplement

Supplement (gms)	Weight (kg/animal)			
	Block I	Block II	Block III	
Riomax				
0	45	41	47	133
25	52	50	55	157
35	47	46	48	141
45	53	51	57	161
55	54	52	55	161
			753	
Hudsons				
0	42	46	48	136
25	53	58	52	163
35	48	42	41	131
45	54	52	43	149
55	58	56	52	166
			745	
Jeffers				
0	48	44	42	134
25	53	52	51	156
35	42	48	48	138
45	53	55	58	166
55	52	58	54	164

Was there any interaction at the 5% level of significance? (15 marks)