



WI 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 ARCHITECTURE & PLANNING
ASH 1307: 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 3 levels of fertilizer and 4 groundnut varieties arranged according to a RC(31) 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:	52	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)	52(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 (kg/plot)	Weight (kg/animal)			
	Block I	Block II	Block III	
Rising				
0	45	43	47	135
25	52	50	55	157
50	47	47	49	143
75	58	51	57	166
100	54	52	55	161
Hudsons			753	
0	42	46	48	136
25	53	58	52	163
50	48	47	43	138
75	54	52	45	151
100	58	56	52	166
Jeffers			745	
0	48	44	42	134
25	52	52	51	155
50	42	48	46	136
75	53	55	58	166
100	52	58	54	164

Was there any interaction at the 5% level of significance?

(15 marks)