CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF DOCTOR OF PHILOSOPHY IN COUNSELLING PSYCHOLOGY

CPSY 912: QUANTITATIVE AND QUALITATIVE DATA ANALYSIS IN COUNSELLING PSYCHOLOGY

STREAMS: PhD (COUNSELING PSYCHOLOGY)   **TIME: 3 HOURS**

DAY/DATE: THURSDAY 19/12/2019   **8.30 A.M. – 11.30 A.M.**

INSTRUCTIONS:
- **Answer any THREE questions.**

QUESTION ONE (20 MARKS)

(a)   The following data shows the annual number of client who sort for consultancy services in three different MCK offices over a period of four years.

	Annual number of		Client
	X	Y	W
2014	250	150	250
2015	200	180	200
2016	150	200	150
2017	200	250	150

Required: Present above information in a

(i)   Multiple bar chart   (3 marks)
(ii)   Component bar chart   (3 marks)

(b)   The following tables shows the distribution of masses of 40 logs of wood in a particular Town

Mass (Kg)	20-29	30-39	40-49	50-59	60-69	70-79	80-89

Frequency	6	5	7	10	5	4	3

Required

    (i)   Mean
    (ii)   Mode
    (iii)   Median
    (iv)   Standard Deviation
    (v)   Coefficient of variation   (8 marks)

(c)   The time taken to compete jobs of a particular type is known to be normally distributed with a mean of 6.4 hours and standard deviation of 1.2 hours. What is the probability that randomly selected job of this type takes;

    (i)   Less than 6 hours   (2 marks)
    (ii)   Between 6 and 7 hours   (2 marks)
    (iii)   More than 7 hours   (2 marks)

QUESTION TWO (20 MARKS)

(a)   A milk producers union wishes to the test whether the preference pattern of consumers for its products is dependent on income levels. A random sample of 500 individuals gives the following data.

	Product Preferred			
Income	A	B	C	Total
Low	170	30	80	280
Medium	50	25	60	135
High	20	10	55	85
Total	240	65	195	500

Required
Use Chi-Square test at 5% significance level to find out if the preference patterns are independent of income levels?   (10 marks)

(b)   Twelve people of different ages were given a memory test with the following results.

Age	70	68	62	53	50	46	35	28	25	22	20	18
Test Score	48	50	60	55	62	74	69	78	82	80	93	90

Required: Calculate the Spearman's rank correlation coefficient and make a comment.
    (10 marks)

QUESTION THREE (20 MARKS)

(a)   Outline four uses of regression analysis in social science.   (4 marks)

(b)   The demand and prices (in Kshs thousands) for a bag of a hybrid 100kg bag of wheat in different regions of the country is as shown below.

Price (X)	56	60	62	65	70	80	90
Demand (Y)	138	148	150	156	153	160	173

Required:
(i)   Fit a least square regression line ((8 marks)
(ii)   Suppose that you found a bag in one of the shops of the same kind of wheat costing Kshs 58,000 what would you approximate its demand in that area
to be?
                                                                 (2 marks)
(iii)   Compute Pearson moment correlation coefficient and make comment. (6 marks)

QUESTION FOUR (20 MARKS)

(a)   In comparing the length of the tensile strength of two kinds of structural steel, an experiment yielded the following results: $m = 13$, $n = 16$. The sample variance of the first sample was 19.2 and for the second sample was 3.5. Assuming the measurements constitute   an independent sample from normal population. Using F-test at 5% significance level, test
        the null hypothesis that   (5 marks)

(b)   The marks of 30 students in class were recorded as follows:

320	324	335	312	324	312	300	348	325	351
340	314	315	340	308	301	316	326	350	310
326	352	327	303	350	342	328	327	328	341

Required
(i)   Create a suitable Grouped frequency distribution (start: 300-309 class) (5 marks)
(ii)   Draw a histogram and frequency polygon on the same axis to represent data.
                                                                 (5 marks)
(iii)   Plot a stem and leaf display   (5 marks)

QUESTION FIVE (20 MARKS)

(a)   In a political group of 12 members the probability of picking a member from any of the
six   geo-political zones in Kenya is two third ( ). If some members are to represent the group in a National meeting. Assuming binomial distribution, find the probability that

(i)   8 members are chosen

(ii)   At most 8 members are chosen

(iii)   At least 8 members are chosen   (10 marks)

(b)   The following data represent the breaking strength of a certain kind of elastic material in pounds.

163	165	160	189	161	171	158	151	169	163	139	162		
172	165	148	166	172	163	187	173	149	175	163	130	185	159

Required

Use the sign-test to test whether the average breaking strength is greater than 160. Use alpha =5%   (10 marks)