

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DOCTOR OF PHILOSOPHY IN PSYCHOLOGY

CPSY 912: QUANTITATIVE & QUALITATIVE DATA ANALYSIS IN COUNSELING

STREAMS: PhD (PSYCHOLOGY)

TIME: 3 HOURS

DAY/DATE: WEDNESDAY 5/12/2018

2.30 P.M - 5.30 A.M.

INSTRUCTIONS:

- Answer any THREE Questions
- Do not write anything on the question paper

QUESTION ONE: [20 MARKS]

(a) The marks for 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) [4 Marks]
- (ii) Draw a histogram and frequency polygon on the same axis to represent the data [4 Marks]
- (iii)Plot a stem and leaf display. [4 Marks]

(b) The data below represent a sample of statistics achievement test scores and calculate grades for 10 independently selected college students.

Student	1	2	3	4	5	6	7	8	9	10
Math test score (X)	39	43	21	64	57	47	28	75	34	52
Final calculate grade (Y)	65	78	52	82	92	89	73	98	56	75

Required:

From evidence, would you say that the achievement test scores and calculated grades are independent? Use t-test at 5% significance level. [8 Marks]

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QUESTION TWO [20 MARKS]

- (a) A milk producers union wishes to 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 a 5% significance level to find out if the preference patterns are independent of income levels. [10 Marks]

- (b) The following data shows the annual number of client who sort for counseling 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 the above information in a

- (i) Multiple bar chart [5 Marks]
(ii) Component bar chart [5 Marks]

QUESTION THREE: [20 MARKS]

Twelve people of different ages were given a memory test with the following results;

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

Required:

- (i) Fit a simple regression line to the above data [$Y = \beta_0 + \beta_1 X + e$] [12 Marks]
(ii) Calculate the Spearman's rank correlation coefficient and make a comment. [8 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

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sample from normal population. Using F-test at 5% significance level, test the null hypothesis that $H_0: \sigma_1^2 = \sigma_2^2$ vs $H_1: \sigma_1^2 \neq \sigma_2^2$ [9 Marks]

(b) The following table 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 [11 Marks]

QUESTION FIVE: [20 MARKS]

(a) The following is arrangement of men (M) and women (W) lined up to pay tuition fees at Chuka University;

MMMWWMMMWWMMWWMMMWWMMWWMMMWWMMM
 WWMMWWMMWWMMWWWWWMMMWMWWMMMWWMMMWW
 WWMMWWMMMWWMMWWMMWWMMWWMMWWMMMWWMMM

Test for randomness at alpha=5%. [12 Marks]

(b) The following data represent braking 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% [8 Marks]

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