THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN SOCIAL WORK AND COMMUNITY DEVELOPMENT

MODULE II

STATISTICS

3 hours

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INSTRUCTIONS TO CANDIDATES

This paper consists of EIGHT questions.
Answer FIVE questions in the answer booklet provided.
All questions carry equal marks.
Maximum marks for each part of a question are as indicated.
Candidates should answer the questions in English.

This paper consists of 7 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

Turn over

1. (a) Explain **four** reasons for studying Social Statistics. (8 marks)

(b) The following are marks scored by 50 students in an examination:

57	44	80	75	00	18	45	14	04	64
72	51	69	34	22	83	70	20	57	28
96	56	50	47	10	34	61	66	80	46
22	10	84	50	47	73	42	33	48	65
10	34	66	53	75	90	58	46	39	69

Prepare a frequency distribution table using the exclusive method, starting with 0 - 10, 10 - 20, ... (12 marks)

2. (a) The following are the scores awarded by two Judges: Judge I and Judge II, in a beauty contest, involving eight contestants:

Contestant	:	A	B	C	D	E	F	G	H
Judge I	:	17	13	15	16	6	11	14	9
Judge II	:	36	46	35	24	12	18	27	22

(i) Determine the Spearman's Rank Correlation Coefficient;

(ii) Interpret the results in (i) above. (12 marks)

(b) The following are the scores of 120 interviewees for a vacant post in a community organization:

Score (x)	:	10	20	25	40	50
Number of interviewees (f):		20	30	50	15	5

Using the data above, calculate the Harmonic Mean. (8 marks)

3. (a) Explain **four** characteristics of a good measure of dispersion. (8 marks)

(b) The following information relates to monthly income of 6 households in a community and their respective number of children.

Household Monthly Income (Ksh '000') (x)	Number of Children (y)
10	6
12	6
16	5
22	3
30	2
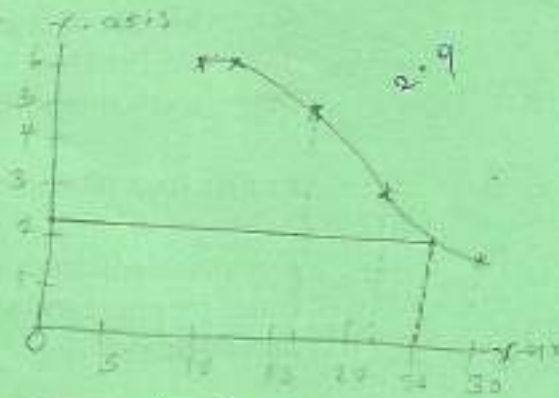
(i) Using the data above, determine the regression equation of y on x.

(ii) Based on the equation in (i) above, estimate the number of children in a household with a monthly income of Ksh 25,000. (12 marks)

4. (a) In a language college, there are 60 students. Of these students, 30 study French, 25 study German and 20 study both French and German.

(i) Draw a Venn diagram to present the information above.

(ii) Calculate the number of students who study:

I. French only;
II. German only;
III. neither French nor German.

(iii) Calculate the probability that a student chosen at random studies either French or German. (12 marks)

(b) Highlight **four** factors to be considered when choosing the size of a sample. (8 marks)

5. (a) The manager of a beverage company claims that the average content of their bottles of a soft drink is 0.5 litres. A random sample of 100 bottles is selected and the mean content of the bottles is found to be 0.45 litres, with a standard deviation of 0.10 litres. Test the manager's claim at 5% level of significance. (8 marks)
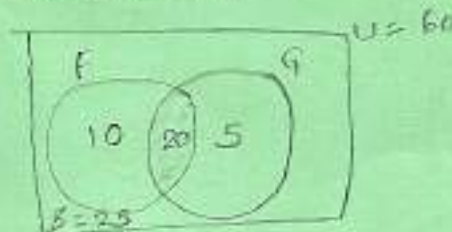
(b) The annual demand for material, Mx, used in a production process of a company is 50,000 units. The ordering cost is Ksh 500 per order. The purchase price of the material is Ksh 400 per unit. The holding cost is Ksh 200 per unit per annum. Determine the:

(i) Economic Order Quantity (EOQ);
(ii) number of orders per year;
(iii) total relevant costs associated with inventory;
(iv) total costs of the inventory. (12 marks)

6. (a) Explain **four** rules to be followed when drawing a network diagram. (8 marks)

(b) A community intends to invest in either project A or project B. The initial investment outlay for either project is Ksh 1,000,000. The following are the expected cash inflows of each project:

Cash Inflows (Ksh)

Year	Project A	Project B
1	200,000	300,000
2	450,000	600,000
3	350,000	200,000
4	200,000	200,000

The cost of capital is 12%.

(i) Determine the Net Present Value (NPV) of each project.
(ii) Based on the results in (i) above, advise the management on the project to invest in. (12 marks)

7. (a) The following are the monthly wages paid in a community project for the year 2017.

Month	Wages (Ksh '000')
January	20
February	22
March	20
April	24
May	30
June	32
July	20
August	18
September	22
October	24
November	30
December	32

(i)   Determine the three month moving averages from the information above.

(ii) Based on the results in (i) above, determine the three months with the lowest expenditure on wages. (12 marks)

(b) Differentiate between the following pairs of terms as applied in estimation and test of hypothesis:

(i)   Point estimate and interval estimate;
(ii) Z-test and t-test. (8 marks)

8. (a) Distinguish between each of the following pairs of terms as applied in project appraisal:

(i)   Annuity and perpetuity;
(ii) Compounding and discounting. (8 marks)

(b) The following information relates to production of three commodities in a community over a period of 4 years:

Production (Tonnes)

Year	Beans	Maize	Groundnuts
2014	10	15	5
2015	5	10	5
2016	15	20	10
2017	15	15	10

Present the information above in a component bar chart. (12 marks)