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 **6 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** functions of social statistics. (8 marks)

   (b) The following are marks scored by 50 candidates in a Statistics examination.

28	43	66	64	99	80	21	30	60	44
62	84	96	60	41	25	30	70	69	88
73	70	21	20	36	32	91	97	58	38
47	41	55	49	54	70	82	53	63	72
80	77	93	40	61	70	84	89	81	92

   (i) Prepare a frequency distribution table using the exclusive methods; starting with 20 - 30. (10 marks)

   (ii) From the table prepared in (i) above, calculate the mean mark. (2 marks)

2. (a) Explain **four** qualities of a good measure of central tendency. (8 marks)

   (b) The following table shows the distribution of the number of water pipes sold to 50 retailers in Wema town.

Number. of water pipes	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Number. of retailers	3	7	12	15	8	3	2

   Using the above information, calculate:

   (i) variance;
   (ii) standard deviation.

   (12 marks)

3. (a) Explain each of the following types of correlation:

   (i) Positive correction; (2 marks)
   (ii) Negative correlation; (2 marks)
   (iii) Zero correlation; (2 marks)
   (iv) Spurious correlation. (2 marks)

   (b) Jenny has a bag with 7 green tennis balls and 3 blue tennis balls in it. He picks a ball at random from the bag, replaces it and then picks a ball again at random.

   (i) Draw a tree diagram to represent the above information.

(ii) Calculate the probability that she picks:

    (I)   two blue balls;

    (II)   no blue ball;

    (III) at least one green ball;

    (IV) one ball of each colour.

(12 marks)

4. (a) Highlight **four** reasons for using sampling techniques in carrying out research.

(8 marks)

(b) Wabera Community intends to undertake a project which has the following activities and duration.

Activity		Processing activity	Duration (days)
A		–	5
B		–	4
C		A	8
D		B	8
E		B	8
F		B	5
G		C, D	8
H		E, I	22
I		F	2
J		G	12

(i) Draw a network diagram to represent the project. (10 marks)

(ii) Determine the:

    (I)   critical path;

    (II)   project duration.

(2 marks)

5. (a) Explain **four** uses of time-series analysis. (8 marks)

(b) Mr. Kairo wanted to investigate whether gender and preferred colour of T-shirt were independent. He carried out a survey and organized the data as follows:

T-shirts Gender	Green	Yellow	Black	Red
Male	48	12	33	57
Female	34	46	42	26

(i) Calculate the (χ^2) chi-square test statistic.   (10 marks)

(ii) Interpret the result obtained in (i) above at 5% level of significance.   (2 marks)

6. (a) Explain **four** factors that should be considered when evaluating an investment project.   (8 marks)

(b) Jersey Limited uses material X_2 in its manufacturing process. The following information relates to the company.

- Annual requirement 12,000 kilograms.
- The purchase price is Ksh 3 per kilogram.
- The carrying cost is 20% of the purchase price.
- The ordering cost is Ksh 100 per order.

Calculate the :

(i) Economic Order Quantity (EOQ);
(ii) number of orders to be made in a year;
(iii) total inventory cost.   (12 marks)

7. (a) Explain **five** essentials of a well prepared statistical table.   (10 marks)

(b) Karl Pearson's co-efficient of skewness of a distribution is +0.32. The standard deviation is 6.5 and mean is 29.6. Calculate:

(i) mode;   (5 marks)
(ii) median.   (5 marks)

8.   (a)   Highlight **four** uses of the theory of probability in real life situation.   (8 marks)

(b)   Mohan Limited intends to purchase either machine X or Y. The cost of each machine is Ksh 50,000. The following are the expected cash inflows from the machines.

Year		Machine X (Ksh)	Machine Y (Ksh)
1		15,000	5,000
2		26,000	15,000
3		25,000	20,000
4		15,000	30,000
5		10,000	20,000

(i)   Calculate the payback period for each machine.   (10 marks)

(ii)   Advice the management on which machine to purchase, depending on the result obtained in (i) above.   (2 marks)