THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN SOCIAL WORK AND COMMUNITY DEVELOPMENT MODULE II

STATISTICS

3 hours

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided above.
Sign and write the date of the examination in the spaces provided above.
This paper consists of EIGHT questions in TWO sections; A and B.
Answer a total of FIVE questions, as shown below, in the spaces provided in this question paper:
   any TWO questions from section A;
   any TWO questions from section B;
   any other ONE question from either section A or section B.
ALL questions carry equal marks.
Candidates should answer the questions in English.

For Examiner's Use Only

Section	Question	Maximum Score	Candidate's Score
A		20	
		20	
B		20	
		20	
		20	
	Total Score		

This paper consists of 12 printed pages.

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

SECTION A

Answer at least TWO questions from this section.

1. (a) State and explain **four** ways of classifying data (8 marks)

   (b) In a certain faculty there were 250 students. 72 students registered for communication skills, 64 for entrepreneurship education, 62 for economics, 18 for both communication skills and entrepreneurship education, 24 for communication skills and economics, 20 for economics and entrepreneurship education and 8 for all the three subjects:

   (i) draw a venn diagram to represent this information; (8 marks)

   (ii) determine the number of students who registered for at least one subject; (2 marks)

   (iii) determine the number of students who did not register for any subject. (2 marks)

2. (a) (i) Explain the meaning of 'bias' as applied in sampling. (2 marks)

   (ii) State and explain **four** types of bias. (8 marks)

   (b) A random sample of 1000 households showed 13% to be living below a defined poverty line. Calculate a 95% confidence interval for the percentage living below the defined poverty line in the population. (10 marks)

3. (a) Explain the following measures of dispersion:

   (i) range;
   (ii) quartile deviation;
   (iii) mean deviation;
   (iv) standard deviation.

   (8 marks)

(b)   The following table shows masses of parcels delivered by an organisation.

Mass (gm)	Frequency
120 - 124	10
125 - 129	15
130 - 134	12
135 - 139	23
140 - 144	16
145 - 149	20
150 - 154	4

Determine the:

(i)   interquartile range;   (8 marks)

(ii)   4th decile.   (4 marks)

4.   A sociologist was hired by a large city hospital to investigate the relationship between the number of unauthorized days that an employee is absent per year and distance in kilometres between home and work place for the employees. A sample of 10 employees were chosen and the following data was collected:

Distance to work (km)	1	3	4	6	8	10	12	14	14	18
Number of days absent	8	5	8	7	6	3	5	2	4	2

(i)   compute the least squares regression line of number of days absent on distance to work;   (11 marks)

(ii)   determine the number of days absent if the distance to work is 7 kilometres;   (3 marks)

(iii)   calculate the product moment correlation coefficient.   (6 marks)

SECTION B

Answer at least TWO questions from this section.

5. (a) Explain the meaning of the following terms as applied in network analysis:

   (i)   network planning;
   (ii)   an activity;
   (iii)   an event;
   (iv)   sub-critical;
   (v)   critical path.

   (10 marks)

   (b) A community project has the following data:

Activity	Intermediate predecessors	Duration (weeks)
A	-	5
B	-	4
C	B	6
D	A,C	2
E	A,C	7
F	A,C	12
G	B	6
H	F,G	4
I	E,D	5
J	H,I	3

   (i)   draw a network diagram to represent the various activities of the project;

   (8 marks)

   (ii)   determine the critical path and the normal project duration.   (2 marks)

6. (a) Describe the following terms as applied in statistics:

   (i)   statistical inference;
   (ii)   statistical estimation;
   (iii)   testing of hypothesis.

   (6 marks)

(b)   The following are marks obtained by students in a statistics examination:

24	13	28	15	25	29	15	46
9	10	17	22	23	17	16	32
11	12	18	20	13	27	18	22
20	14	26	14	19	19	40	31
17	21	23	26	18	24	21	27

(i)   make a frequency distribution table starting with a class interval of 5 - 9, ...

(9 marks)

(ii)   using the frequency distribution table in (i) above, determine the mean and median mark.

(5 marks)

7.   Loki Limited can invest in one of the following two projects A and B, which require an initial cash outlay of kshs. 1,000,000 and will pay an interest rate of 10% on the amount. The project will generate the following cash inflows:

Year	Project A	Project B
1	500,000	600,000
2	40,000	100,000
3	100,000	40,000
4	600,000	500,000
5	160,000	100,000

Calculate:

(i)   payback period (P.B.P);   (4 marks)
(ii)   net present value (N.P.V);   (6 marks)
(iii)   internal rate of return (I.R.R).   (10 marks)

8.   (a)   Describe the following methods of forecasting:

(i)   market research;
(ii)   business barometers;
(iii)   delphi method;
(iv)   lead-lag analysis.

(8 marks)

(b)   The mean number of strikes in a particular industry was found to be 1.2 per week. Determine the probability that during a given week there will be:

(i)   no strikes;   (3 marks)
(ii)   more than 2 strikes;   (5 marks)
(iii)   exactly 4 strikes.   (4 marks)