2428/204
STATISTICS
June/July 2016
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN SOCIAL WORK AND COMMUNITY DEVELOPMENT

MODULE II

STATISTICS

3 hours

INSTRUCTIONS TO CANDIDATES

*This paper consists of **EIGHT** questions.*
*Answer any **FIVE** questions in the answer booklet provided.*
All questions carry equal marks.
Candidates should answer the questions in English.

This paper consists of 5 printed pages.

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

1. (a) Define the following terms as used in measures of central tendency:

(i) mean;
(ii) median;
(iii) mode.

(6 marks)

(b) The table below shows the monthly wages paid to social workers of Jinja County:

Monthly wages Ksh (000)	Number of workers
5 - 10	5
10 - 15	6
15 - 20	15
20 - 25	10
25 - 30	5
30 - 35	4
35 - 40	2
40 - 45	2

Calculate the:

(i) mean;
(ii) median;
(iii) mode.

(14 marks)

2. (a) Outline **four** importance of sampling in research. (8 marks)

(b) A society plans to undertake a certain project, which has the following activities with their associated duration in days:

Activity	Predecessor	Time (days)
A	-	5
B	-	4
C	A	6
D	B	2
E	A, C	7
F	B	12
G	C, D	6
H	G, F	4
I	E	5

(i) draw a network diagram for the project;
(ii) identify the critical path and associated critical activities;
(iii) determine the normal project duration. (12 marks)

3. Distinguish between each of the following terms as applied in investment appraisal:

(a) (i) simple and compound interest;
(ii) annuities and perpetuities. (8 marks)

(b) Mali Mali enterprises is considering whether to invest in a given project. The expected net cash flows for the project is as shown below:

Year	Cash flow Ksh (000)
0	(9,500)
1	6,000
2	9,400
3	9,600
4	6,400

The cost of capital is 20 per cent.

Calculate the:

(i) net present value; (4 marks)
(ii) profitability index; (2 marks)
(iii) internal rate of return. (4 marks)

(c) advice the management on whether to proceed with the investment in (b) above. (2 marks)

4. (a) (i) Explain the term "kurtosis". (2 marks)
(ii) With the aid of an appropriate diagram, explain each of the following terms:

(I) leptokurtic;
(II) platykurtic;
(III) mesokurtic. (6 marks)

(b) A bag contains eight green balls and six red balls. Two balls are picked randomly from the bag. Find the probability that:

(i) both balls are red;
(ii) both balls are green;
(iii) the two balls are of different colours;
(iv) at least one ball is red. (12 marks)

5. (a) Kismart Limited uses material Z in its production process. The material is consumed at a rate of 500 kilograms per week. The cost of material is Ksh 75 per kilogram. Stock holding cost is 25 per cent on purchase price per kilogram. Stock ordering costs are Ksh 375 per order. The firm operates for 50 weeks in a year.

Find:

(i) economic order quantity;
(ii) the economic order quantity if the stockholding cost increase to 31.25 per cent on purchase price;
(iii) total relevant cost. (12 marks)

(b) Explain the following terms as used in probability:

(i) mutually exclusive events;
(ii) compound events;
(iii) complementary events;
(iv) independent events. (8 marks)

6. (a) Differentiate the following terms as used in hypothesis testing:

(i) null and alternative hypothesis;
(ii) type I and type II error;
(iii) one tailed and two tailed test. (12 marks)

(b) The following information relate to monthly wages paid to workers of Mambo enterprises:

Amount Ksh (000)	Number of workers
12	4
13	11
14	32
15	21
16	15
17	8
18	5
20	4

Calculate the standard deviation of the wages paid to workers of Mambo enterprises. (8 marks)

7. (a) Describe **three** main uses of regression analysis. (6 marks)

(b) The following information relate to marks scored by seven students in two different examination papers:

Paper I	51	54	55	59	65	60	70
Paper II	38	44	33	36	33	23	10

(i) Find the coefficient of correlation between the marks scored in the two examination papers;
(ii) Interpret the results above;

Hint: $r = \frac{n\Sigma dx.dy - \Sigma dx.\Sigma dy}{\sqrt{[n\Sigma dx^2 - (dx)^2][n\Sigma dy^2 - (\Sigma dy)^2]}}$ (14 marks)

8. (a) In the 1992 Summer Olympics, 37 countries won gold models, 44 won Silver Medals, 54 won bronze medals, 30 won both gold and silver medals, 33 won both gold and bronze medals, 36 won silver and bronze medals and 28 won gold, silver and bronze medals.

Required:

(i) Present the information above in a venn diagram. (8 marks)
(ii) How many countries won only gold medals? (2 marks)
(iii) How many countries won gold and silver medals but no bronze medals? (2 marks)
(iv) Determine the total number of countries that won at least an olympic medal in the competitions. (2 marks)

(b) Explain **three** importance of time series analysis. (6 marks)

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