

SCAN

Name \_\_\_\_\_ Index No. \_\_\_\_\_

1920/104  
MATHEMATICS  
July 2015  
Time: 3 hours

Candidate's Signature \_\_\_\_\_

Date \_\_\_\_\_



THE KENYA NATIONAL EXAMINATIONS COUNCIL  
CRAFT CERTIFICATE IN INFORMATION STUDIES

MATHEMATICS

3 hours



INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided above.

Sign and write the date of examination in the spaces provided above.

This question paper contains **FIFTEEN** questions in two sections: **A** and **B**.

Answer **ALL** the questions in section **A** and any **FOUR** in section **B** in the spaces provided in this paper.

Candidates should answer the questions in English.

For Examiner's Use Only

Section	Question	Maximum score	Candidate's score
A	1 - 10	40	
B	11	15	
	12	15	
	13	15	
	14	15	
	15	15	
Total score			

This paper consists of 16 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 (40 marks)

Answer ALL the questions in this section in the spaces provided.

1. State three properties of a binomial probability distribution.

(3 marks)

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2. A farmer intends to plant potatoes on a 40 acre piece of land, maize on a 25 acre piece and wheat on a 30 acre piece. The cost of seeds for an acre of potatoes, maize and wheat is Ksh 400, Ksh 300 and Ksh 500 respectively.

- (i) Using a row vector and column vector for acreage and cost respectively, represent this information.

(2 marks)



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- (ii) Determine the total cost of seeds for the three pieces of land.

(2 marks)

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3. Compute each of the following using binary arithmetic;

(2 marks)

- (a)  $23_{10} - 7_{10}$  using one's complement;

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8. (a) Table 1 shows the probability distribution of the commission earned by a salesperson. Determine the expected commission earned by a salesperson. (2 marks)

Commission in Ksh	0	1000	2000	3000	4000
Probability	0.05	0.15	0.25	0.45	0.1

Table 1

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- (b) Using binomial expansion determine the first **four** terms in the expansion of  $(1-2x)^8$  in ascending powers of  $x$ . (3 marks)

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9. Determine each of the following for matrix  $A = \begin{bmatrix} 5 & -7 \\ 3 & 2 \end{bmatrix}$
- (i)  $A^{-1}$  (2 marks)

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**SECTION B (60 marks)**

Answer any **FOUR** questions in this section in the spaces provided.

11. (a) Define each of the following terms as used in matrices:

(i) identity matrix;

(2 marks)

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(ii) singular matrix;

(2 marks)

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(iii) orthogonal matrix.

(2 marks)

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(b) Table 2 shows breakfast menu in that customer may choose an item from each of the groups. Use it to answer the questions that follow.

Breakfast Sandwich	Accompaniments	Juice
Beef burger chicken burger vegetable burger	breakfast potatoes apple slices fresh fruit cup pastry	orange cranberry tomato apple grape

Table 2





12. (a) Convert the number  $46_{10}$  to its excess-3 code equivalent. (2 marks)

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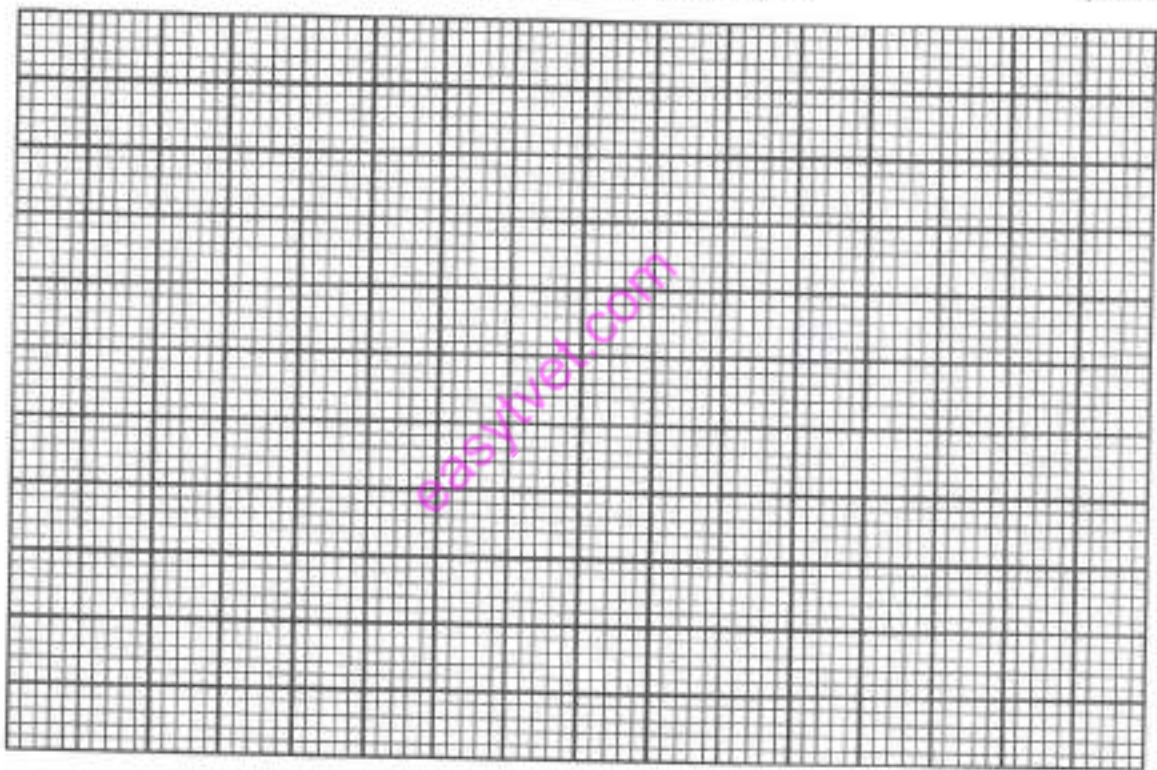
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- (b) Construct a graph to represent the linear inequality  $2x + y \leq 6$  (3 marks)



- (c) Explain each of the following measures as used in statistics:

(i) arithmetic mean;

(2 marks)

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(ii) standard deviation;

(2 marks)



(iii) quartiles.

(2 marks)

(d) Given that function  $g(x) = x^2$ , determine each of the following:

(i)  $g(2x) - 1$ ;

(2 marks)

(ii)  $g(-5)$  .

(2 marks)



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13. (a) Define each of the following computer coding systems:

(i) ASCII;

(2 marks)

(ii) GRAY.

(2 marks)















