

CHUKA



UNIVERSITY

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EXAMINATION FOR THE AWARD OF DIPLOMA IN COMPUTER SCIENCE

COSC 0172: MATHEMATICS FOR COMPUTING II

STREAMS: DIP. COMP.SCI

TIME: 2 HOURS

DAY/DATE: MONDAY 08/4/2019

11.30 A.M. – 1.30 P.M.

INSTRUCTIONS: Answer question ONE and any other TWO questions

QUESTION ONE (30 MARKS)

(a) State six applications of linear programming [6 marks]

(b) If $A = \begin{bmatrix} 2 & 1 & 3 \\ -1 & 0 & 1 \\ 3 & 4 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -1 & 3 \\ 1 & 0 & 1 \\ 1 & 1 & 3 \end{bmatrix}$

(i) Find AB [3 marks]

(ii) Find $B^{-1}A$ [5 marks]

(c) If we have 12 soft centred and 8 hard centred chocolates in a box, draw a tree diagram and use it to find the following

(i) The probability of selecting the first chocolate and getting a soft-centred and hard centred chocolate [2 marks]

(ii) P (soft and soft centred) [2 marks]

(iii) P (Hard and soft centred) [2 marks]

(iv) P (soft and Hard centred) [2 marks]

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(v) P (Hard and soft or soft and Hard) [2 marks]

(d) Solve for x in the linear inequality and state its property $2(3x+2)-20 > 8(x-3)$

[3

marks]

(e) Find the mean of the following data

x	2.0	2.2	2.3	2.8	3.0
f	2	4	6	3	5

[3 marks]

QUESTION TWO (20 MARKS)

(a) (i) State the advantages and disadvantages of mean as used in the measures of dispersion [5

marks]

(ii) Find the mean of the following data using the assumed mean of 109.5. [5 marks]

Class limit	f
60- 79	8
80 – 99	16
100 – 119	12
120 – 139	8
140 – 159	6

(iii) Find median and mode of the data below

[8 marks]

Class interval	f
90 - 99	5
100 – 109	8
110 – 119	22
120 – 129	27
130 – 139	17
140 – 149	9
150 – 159	5
160 – 169	5
170 – 179	2

(iv) Find MN if $\begin{bmatrix} 2 \\ -1 \\ 1 \end{bmatrix}$ and $N = [1-2-3]$ [2 marks]

QUESTION THREE (20 MARKS)

(a) Use the data given below to find;

- (i) D_7
- (ii) P_{65}
- (iii) Mean
- (iv) Mode
- (v) Semi-Interquartile deviation
- (vi) Mean Absolute Deviation (M.A.D)
- (vii) Standard deviation

[20 marks]

Class level	f
0 – 9	5
10 – 19	8
20 – 29	7
30 – 39	12
40 – 49	28
50 – 59	20
60 – 69	10
70 – 79	10

QUESTION FOUR (20 MARKS)

- (a) State four advantages and disadvantages of liner programming [8 marks]
- (b) At the start of the current week, there were 30 units of Y in stock. Available processing time on machine A is forecasted to be 40 hours and on machine B is forecasted to be 35 hours. The demand for X is the current week in forecasted to be 75 units. Company policy is to maximize the combined sum of the units of X and the units of Y in stock at the end of the week

Required:

- (i) Formulate the problem of dividing how much of each product to make in the current week as a linear program [4 marks]
- (ii) Solve the linear program graphically [8 marks]

QUESTION FIVE (20 MARKS)

(a) The question “Do you smoke?” was asked of 100 people.

Results are as shown in the table

	YES	NO	TOTAL
MALE	19	41	60
FEMALE	12	28	40
TOTAL	31	69	100

- (i) What is the probability of randomly selecting an individual being a male who smoke [2 marks]
- (ii) What is the probability of randomly selecting an individual being a male? [2 marks]
- (iii) What is the probability of randomly selecting an individual who smoke? [2 marks]
- (iv) What is the probability of selecting a male and a female who smoke? [2 marks]
- (v) What is the probability that a randomly selected smoker is male? [2 marks]

(b) Given $A = \begin{bmatrix} 0 & -1 & 2 \\ 1 & -1 & -3 \\ -2 & 3 & 5 \end{bmatrix}, B = \begin{bmatrix} 4 & 11 & 5 \\ 1 & 4 & 2 \\ 1 & 2 & 1 \end{bmatrix}$

- (i) Find AB [5 marks]
- (ii) Hence solve the simultaneous equation

$$4x + 11y + 5z = 2$$

$$x + 4y + 2z = 1$$

$$x + 2y + z = 4$$

[4 marks]