COSC 0172: MATHEMATICS FOR COMPUTING II

I NSTRUCTIONS:

Answer all questions in section A and any other two in section B

Do not write anything on the question paper

Non-programmable electronic calculators may be used

SECTION A

QUESTION ONE (30 marks)

a) Given B= $\begin{pmatrix} 4 & 11 & 5 \\ 1 & 4 & 2 \\ 1 & 2 & 1 \end{pmatrix}$, Find B^{-1} (3 marks)

b) Hence, solve the simultaneous equations (3 marks)

4x+11y+5z=2

X+4y+2z=1

X+2y+z=4

c) Find the mean and the standard deviation of the data (6 marks)

Class interval	**F**
0-2	1
3-5	6
6-8	10
9-11	7
12-14	0
15-17	2

d) Solve for x in the linear inequality 2(4x+2)-20>8(2x-3) (3 marks)

e) Distinguish between conditional probability and empirical probability. (4marks)

f) Find the quotient and the remainder in the following equation$x^4 + x^3 - 17x^2 - 20x + 32$ Divided by $x - 4$ (5 marks)

g) Graph the following linear inequalities $2x - 5y \leq 10,\ \ x + 2y \leq 8, x \geq 0,\ \ y \geq 0$

(3 marks)

h) State three advantages and three demerits of arithmetic mean (3 marks)

SECTION B

QUESTION TWO (20 MARKS)

a) The question "do you pray?" was asked of 50 people and the results were as shown in the table

Respondents	Yes	No	Total
Male	17	10	27
Female	14	9	23
Total	31	19	50

Required;

i) What is the probability of randomly selecting an individual being a male who pray? (2 marks)

ii) What is the probability of randomly selecting an individual being a male who don't pray? (2 marks)

iii) What is the probability of randomly selecting an individual who pray? (2 marks)

iv) What is the probability of randomly selecting a male or a female who pray? (2 marks)

v) What is the probability of randomly selecting female who pray? (2 marks)

b) Solve the following inequalities graphically and identify the unwanted regions

$2x \leq y + 6$

$x + y \leq 4$

$y \geq x + 9$

$0.5x \leq 2y + 4$

y>3 (10 marks)

QUESTION THREE (20 MARKS)

a) Use the data given to find D_7, P_{69}, mean, median, semi-interquartile range, MAD and Standard deviation. (14 marks)

Class interval	**F**
0-9	5

10-19	8
20-29	7
30-39	12
40-49	28
50-59	20
60-69	15
70-79	5

b) Show that x+3 is a factor of x^3+6x^2-x-30.find the remaining factors. (6 marks)

QUESTION 4 (20 MARKS)

a) State the properties of a good measure of central tendency (5 marks)

b) Given A= $\begin{pmatrix} 4 & 1 & 8 \\ -2 & 4 & 2 \\ 3 & 4 & 2 \end{pmatrix}$, B= $\begin{pmatrix} 1 & -1 & 3 \\ 1 & 0 & 1 \\ 1 & 1 & 3 \end{pmatrix}$, Find

A^{-1}, B^{-1} and AB (9 marks)

c) If we have 12 soft-centered and 8 hard-centered chocolates in a box, draw a tree diagram and use it to find;

i) P(soft-centered and soft-centered) (2 marks)
ii) P(hard-centered and hard-centered) (2 marks)
iii) P(hard-centered soft-centered or soft-centered hard-centered) (2 marks)