KIBABII UNIVERSITY COLLEGE

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UNIVERSITY REGULAR EXAMINATIONS

2013 /2014 ACADEMIC YEAR

1ST YEAR 2NDSEMESTER EXAMINATIONS

(MAIN EXAMINATION)

FOR THE DEGREE OF BACHELOR OF COMMERCE

COURSE CODE: BCO 105

COURSE TITLE: BUSINESS MATHEMATICS

DATE: 22ND APRIL, 2014 **TIME:** 2:00P.M. – 5:00P.M.

INSTRUCTIONS TO CANDIDATES:

Answer Question ONE (Compulsory) and any other THREE Questions B

QUESTION ONE (a)

An investor wishes to accumulate funds amounting to sh.100,000 in order to buy a grinding mill. This may take him 9 years before reaching the target of Shs.100,000.

He has two options

(i) He can decide to make annual payments into a fund after one year OR
(ii) He may decide to invest a lump sum in the account after one year and let it compound annually.

(a) If the investor decides to make annual payments into a fund after one year, how much will each have to be if the fund pays 8% interest? (4mks)
(b) If the investor takes options (ii) how much will the lump sum be?
(c) If in (a) above the payments are made in the beginning of the year, how much will be the value of the annually (4mks)

QUESTION ONE (b)

A researcher interviewers 750 students in science 190 to were physics students, 50 were registered in chemistry; 90 were registered in physics and chemistry, 20 registered in chemistry and biology, 30 registered in physics and Biology and 10 registered in chemistry, Biology and Physics. If 75% of the rest of the students registered in Biology:-

Using a venn diagram, find

(i) The number of students registered in two courses only (2mks)
(ii) The number of students registered in none of the THREE courses(2mks)
(iii) The number of students registered in only one course (2mks)
(iv) The number of students registered in at least two courses (2mks)

QUESTION ONE (c)

Work out using graphical method

Minimize $C = 0.6X_1 + X_2$

Subject to $10X_1 + 4X_2 \geq 20$

$5X_1 + 5X_2 \geq 20$

$2X_1 + 6X_2 \geq 12$

$X_1 \geq 0 \qquad X_2 \geq 0$

(4mks)

QUESTION TWO

(a) Find X_1 and X_2 using Cramer's rule from the following set of simultaneous equations

$5x_1 + 0.4x_2 = 12$

$3x_1 + 3x_2 = 21$ (8mks)

(b) Plot the graph of the functions

$Y = 4 + 0.1x^2$ (7mks)

QUESTION THREE

An economist researching the market for tea assumes that

$Qt = f(Pt, Y, A, N, Pc$

(i) Explain the above relationship pointing out how the variables interrelate. (13mks)

(ii) Identify the dependable and independent variables (15mks)

QUESTION FOUR

Use Cramer's rule to solve for the unknown variables x_1 , x_2 and x_3 given that

$10x_1 + 3x_2 + 6x_3 = 76$

$4x_1 + 5x_3 = 41$

$5x_1 + 2x_2 + 2x_3 = 54$ (15mks)

QUESTION FIVE

Consider the following input – output table for an economy:

	1	2	3	D	X
1	200	12000	7000		32000
2	1300	48000	11000		90000
3	500	14000	9000		45000
M	300	6000	11000		
V	900	10000	7000		
X	32000	90000	45000		

In the table: D = Final Demand

M = Complementary imports

V = Value Added

(i) Compute the technological matrix. (5mks)

(ii) Determine GNP by factor payments (5mks)

(iii) If exports constitute 40% of final demand, what is the balance of trade (BOT) for the economy. (5mks)