KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS

2016/2017 ACADEMIC YEAR

FIRST YEAR SECOND SEMESTER

SPECIAL /SUPPLEMENTARY EXAMINATION

FOR THE DEGREE OF BACHELOR OF COMMERCE/BUSINESS MANAGEMENT

COURSE CODE: BCO 105/BBA 123

COURSE TITLE: BUSINESS MATHEMATICS

DATE: 25/09/2017   **TIME:** 3.00 PM – 5.00PM

INSTRUCTIONS TO CANDIDATES

Answer Question One in Section A and Any other TWO (2) Questions in Section B

KIBU observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over. ▶

SECTION A (COMPULSORY)

QUESTION ONE (30 marks)
a) i) Differentiate between compound interest and simple interest.(2 marks)
b)A real life situation has been modeled by the following system of simultaneous equations.
$3X+Y+Z=2$
$X-2Y+Z=-9$
$4X+3Y+2Z=1$
a) Find the value of the unknowns using Cramer's rule (5mks)
b) Find the simple interest on sh.200, 000 for 5 years at 8% p.a. [2 marks]
c) Peter has invested Shs.10, 000 in a fixed account earning compound interest at the rate of 2% half yearly. How much money does he get after 4 years?   [4 marks]
d) Calculate the present value of a pension of sh.12, 000 per annum (in perpetuity) at interest rate 7.5%   [2 marks]
e) An item is sold under HP on a deposit of sh.600 and 12 monthly installments of sh.300 each. If the HP price is 12% higher than the cash price, calculate the cash price. [3.5 marks]
f) Juma is traveling to U.K and needs 500 sterling pounds for transport. How much will Juma pay if £1 is exchanged for sh.112?   [2 marks]
g) Solve the simultaneous equations $3u + v = 15$, $u + v = 7$ [3.5 marks]
h) Express 20% as a ratio   [2 marks]
i) State any four types of annuity   [4 marks]

SECTION B (CHOOSEANY TWO QUESTIONS)

QUESTION TWO (20 marks)
a) Calculate the maturity value of a fund paying 9.5% into which 5 annual payments of sh.2,400 are made.[3 marks]
b) The tenants of a rented house have their rent fixed at sh.1, 650 per annum in advance with immediate effect. They plan to stay in the property for 15 years. Find the total value of payments (in today's terms), if the average discount rate is estimated at 10%. [4 marks]
c) A company borrows sh 46, 000, which is compounded at 15%, to finance a new production line. The debt will be discharged at the end of the 5 years with regular annual payments into a sinking fund which pays 11.25%.Calculate the annual payment into the fund and construct a schedule, assuming that the first payment into the fund is made at the end of the first year. [7 marks]
d) After how long will sh.50, 000 amount to sh.75, 000 under simple interest at the rate of 10% half yearly [3 marks]
e) An iron box costs shs. 500. Every year, it depreciates by 10 % of its value at the beginning of that year. Calculate its value after 4 years [3 marks]

QUESTION THREE (20 marks)
a) Njeri bought 1200 mangoes for her business at a price of sh.50 for every 60 mangoes. She discovered that 20 mangoes were rotten and that her family members had consumed 30 mangoes. She sold each of the remaining mangoes at sh.1.25
i) Calculate her profit [3 marks]
ii) Express the buying price to the selling price as a ratio [1 mark]
iii) Calculate profit as a profit of cost and as a percent of sales. [4 marks]

b) If sh.7,500 is invested for 4 years at compound interest, at what rate will the money amount to sh.9,116.30 [4 marks]

c) Peter has invested shs.10, 000 in a fixed deposit account earning compound interest at the rate of 2% half yearly. How much money does he get after 4 years? [4 marks]

d) Find the amount of money invested in 5 years at 11% p.a compound interest to amount to sh.79, 600. [4 marks]

QUESTION FOUR (20 marks)

Given the matrix for a three industry input-output model

A= 0.5 0 0.20   B= 2 4 5
    0.2 0.8 0.12   3 3 4
    1.0 0.4 0.00   3 4 5

a) find

  i) A + B   2marks

  ii) A X B   2 marks

  iii) A/B   2 marks

  iv) B – A   2 marks

(b) Your breakfast consists of orange juice, cereal, and eggs with the following nutritional information:

	OJ	Cereal	Eggs
Protein	0%	10%	20%
Vitamin C	20%	15%	0%
Calories	100	120	100

If you must have 30% protein, 30% Vitamin C and 300 calories for your breakfast. Form the system of linear equations and graphically determine how many servings of OJ, Cereal, and Eggs you should have.   (8 marks)

c) Explain the importance of mathematics in Business and commerce. (4 marks)