JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF BUSINESS & ECONOMICS

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

2ND YEAR 1STSEMESTER 2015/2016 ACADEMIC YEAR

SPECIAL EXAM

COURSE CODE: BBM 3224

COURSE TITLE: BUSINESS MATHEMATICS

EXAM VENUE: **STREAM: (BLSM)**

DATE: **EXAM SESSION:**

TIME: 2   HOURS

Instructions:

1. **Answer Question ONE (COMPULSORY) and ANY other 2 questions**

2. **Candidates are advised not to write on the question paper.**

3. **Candidates must hand in their answer booklets to the invigilator while in the examination room.**

QUESTION ONE

a.The demand and supply equations for a certain commodity are 3p+5x=200 and 7p-3x=56,respectively.Find the value of **x** and **p** at the market equilibrium.**(6mks)**

b. State and explain three methods of valuing stock.   **(6mks)**

c.Explain the components of time series.   **(8mks**)

d.The manufacturer of acertain item can sell all he can produce at the selling price ksh.60 each.It costs him ksh.40 in materials and labor to produce each item ,and he has additional cost (overhead) of ksh.3000 per week in order to operate the plant .Find the number of units he should produce and sell to make a profit of at least ksh.1000 per week.   (**10mks**)

QUESTION TWO

 The table below gives the interaction between various sectors of hypothetical economy.

Industry	Industry I	Industry II	Final III	Gross Demand	Output
Industry I	20	48	18	14	100
Industry II	30	12	54	24	120
Industry III	30	36	36	72	180
Labor Inputs	20	24	72		

a. Determine the input –output matrix **A.**   **(10mks)**

b. Suppose that in the three years, the final demands are anticipated to change to 24, 33, and 75 for the three industries I,II,III, respectively .How much should each industry produce to meet this projected demand.   **10mks)**

QUESTION THREE

a. Marginal cost function for a firm at the production level **x** is given by

C'(X)=23.5 -0.01X

Find the increase in total cost when the production level is increased from 1000 to 1500 units. **(8mks)**

b. A sum of ksh.100, 000 is invested at 6% compound interest per annum .How long does it take the investment to increased in value to ksh.150, 000**. (8mks)**

c. State four applications of Matrices in business. **(4mk**

QUESTION FOUR

A Farm engineering company is planning to market a new combined harvester. The Fixed costs are ksh.300, 000 and the variable costs are ksh.25 per unit.

The wholesale price of products will be ksh.100 per unit. Let x be the number of units.

a. Express the Cost C as a linear function of x. **(5mks)**
b. Express the revenue R as linear function of x. **(5mks)**
c. Find the number of units the company has to sell in order to break even. **(5mks)**
d. Find the profit if 10,000 units are produced and sold. (**5mks**)

QUESTION FIVE

a.A certain manufacturer has a steady demand for 50,000 refrigerators each year. The machines are not made continuously but rather in equally sized batches .Production costs are ksh.100, 000to set up the machinery plus ksh. 1000 for each refrigerator made.In addition, there is a storage (inventory)charge of sh.20.50 per year for each refrigeratorstored. If the demand is steady throughout the year, how should the manufacturer schedule his production runs so as to minimize his total cost?Assume that the production is scheduled so that one new batch is completed just as the previous batch has run out. (**15mks**)

State the financial applications of colanders in business. (**5mks**)