**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**SCHOOL OF BUSINESS & ECONOMICS**

**UNIVERSTIY EXAMINATION FOR DIPLOMA IN BUSUNESS ADMINISTRATION**

**1ST YEAR 1ST SEMESTER 2016/2017 ACADEMIC YEAR**

**BUSIA LEARNING CENTER**

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**COURSE CODE: BBM 2111**

**COURSE TITLE: BUSINESS MATHEMATICS**

**EXAM VENUE:**                                      **STREAM (DBA)**

**DATE: 19/12/2015**                          **EXAM SESSION: 2.00- 3.30PM**

**TIME 1 ½ HOURS**

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**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 (COMPULSORY)   (30mks)

a) Explain any 4 limitations of decision trees                                    (4 marks)

b) A manager has a choice between
- A risky contract promising sh. 17 million with a probability of 0.6 and sh. 6million with a probability 0.4 and
- A diversified portfolio consisting of two contracts with independent outcomes each promising sh.10.5 million with probability of 0.6 and sh.4million with a probability of 0.4

   i) Construct a decision tree for using EMV criteria hence make the decision(3 marks)
   Construct a conditional payoff table for the following data                (5 marks)

c) Oswal mills ltd (OML) is considering whether to enter a very competitive market. In case OML decides to enter this market, it must either install a new forging process or pay overtime wages to the entire workers. In either case, the market could result in (i) high sales (ii)medium sales (iii)low sales or (iv) no sales

(i) Construct an appropriate tree diagram                                    (4 marks)

(ii) Suppose the management of OAM has estimated that, if they enter the market there is a 60% chance of their stockholders approving the installation of the new forge. (this means a 40% chance of paying overtime to all workers). A random sample of the current market structure reveals that OAM has a 40% chance of achieving high sales, 30% chance of medium sales, 20% chance of low sales and a 10% chance of no sales. Construct the appropriate probability tree and determine the joint [probabilities for all branches.
                                                                          (4 marks)

## Question Two

a) Define the following terms                                              (4 marks)
   i)     Sequence
   ii)    Series
   iii)   Arithmetic series
   iv)    Geometrical progression

b) The first term of an arithmetic sequence is 4 and the last term is 64. If the common difference is 5, find the number of terms                                        (4 marks)

c) In January 1990, a man`s salary was k€2520, if his annual increment is k€108, find what his salary was in January 1996                                            (4 marks)

d) In the arithmetic series 1+4+7+10+...... find the sum of the first 10 terms    (4 marks)

e) A geometric series is such that its first term is 2.find the two possible common ratios if the sum of its first three terms is 26.                                    (4 marks)

## QUESTION THREE

a) Distinguish between risks and returns hence give their general objectives     (2 marks)

b) State and explain three main ways of measuring risks                          (6 marks)

c) Write short notes on the following
- Market line                                                             (2 marks)
- Capital structure                                                       (2 marks)

d) Discuss the main reasons why the weighted average method is widely used for calculating required return                                                            (8 marks)

## QUESTION FOUR

a) Distinguish between ordinary annuity and annuity due with example          (4 marks)

b) A business lady can afford to deposit sh.10000 in a saving account today that pays 6% interest compounded annually. How much will she have 5 years from now if she makes no withdrawal          (5 marks)

c) What amount must you invest today at 6% interest rate compounded annually so that you can withdraw $5000 at the beginning of each year for the next 5 years.          (5 marks)

d) Calculate the future value of an annuity due if sh.5000 is deposited at the beginning of each year for the next 5 years. Assume an interest rate of 6% compounded annually.          (6 marks)

## QUESTION FIVE

a) Define the following terms as used in decision making          (7 marks)

i)          A decision maker

ii)           Events or state of nature.

iii)          Action space

iv)          payoffs

b)a business man has three alternatives open to him each of which can be followed by any of the four possible events. The conditional payoff (sh) for each action –event combination are given below

Payoff conditional payoffs

| Alternative | A | B | C | D |
|---|---|---|---|---|
| X | 12 | 0 | -8 | 6 |
| Y | -4 | 16 | 20 | -2 |
| Z | 16 | 8 | 0 | 10 |

Determine which alternative the businessman should choose, if he adopts the:          (5 marks)

i) Maximax criterion

ii) Maximin criterion

iii) Hurwicz criterion, his degree of optimism being 0.7

iv) Laplace criterion

v) Minimax regret criterion

C) Discuss the **four** main types of decision making          (8 marks)