JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF BUSINESS & ECONOMICS

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF BUSINESS ADMINISTRATION (BBA With IT) FOR

THIRD YEAR SEMESTER ONE ACADEMIC YEAR 2018/2019

KISUMU CAMPUS – PART-TIME

COURSE CODE: ABA 315

COURSE TITLE: QUANTITATIVE METHODS IN BUSINESS I

EXAM VENUE:

DATE: 12/08/19   **EXAM SESSION: 9.00 – 11.00AM**

DURATION: 2 HOURS

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INSTRUCTIONS

1. **Answer QUESTION ONE and any other TWO 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 (30MARKS)

a) Given the demand function $q = 50 - 2p$, where q is the quantity and p is the price. Find:

    i)   The demand at prices 4 and 10   **(3marks)**

    ii)   The slope of the demand curve   **(3marks)**

(b)   A box contains 8 red, 3 white and 9 blue balls. If 3 balls are drawn at random, determine the probability that:

    i)   All three are red balls   **(1marks)**

    ii)   Two are red and one is white   **(1marks)**

    iii) None is white   **(1marks)**

    iv) At least one is white   **(1marks)**

    v)   One of each colour is drawn   **(1marks)**

(c) The following information (Table 1) relates to the number of firms and their net output in an industry in the year 2015

    Table 1

No. of firms	90	70	35	15	9	5
Net output (shMills)	12	30	13	17	14	25

Compute for these firms the following:

    i)   E(x)   **(3marks)**

    ii)   Var.(x)   **(2marks)**

    iii) SD(x)   **(1marks)**

(d) Distinguish the following terms as used in network analysis

    i)   Activity and event   **(2marks)**

    ii)   Path and critical path   **(2marks)**

    iii) Total float and free float   **(2marks)**

(e) Explain **FIVE** assumptions of the Economic Order Quantity model   **(5marks)**

(f) Outline two time series forecasting approaches   **(2marks)**

QUESTION TWO (20MARKS)

a) A couple has a probability of 0.4 of getting a girl and 0.6 of getting a boy in a single birth. In two single births, what is the probability that

    i)   They get only boys

    ii)   They get at least a boy

    iii) They get only one boy

    iv) They do not get a boy   **(12marks)**

b) The total revenue (in sh000) obtained from selling X units of a product in a day are given by R, which is a function of variable X.

Given $\dfrac{dR}{dX} = 20 - 4x$

    (i)   Determine the total revenue function R   **(4marks)**

    (ii)   Find the number of units of the product that should be sold per day to maximise the total revenue

                                                                          (4marks)

QUESTION THREE (20MARKS)

a) JOOUST Kisumu campus is working under the following states of nature and associated payoffs (Table 2). Determine the optimal decision under the following criteria

    i)   Maxmax   (**4marks**)
    ii) Maxmin   (**4marks**)
    iii) Laplace   (**4marks**)
    iv) Hurwicz   (**4marks**)
    v)   Minmax   (**4marks**)

Table 2

Strategies	States of nature		
	S1	S2	S3
A	1,200	600	(300)
B	900	800	300
C	500	200	500
Probability	0.25	0.45	0.30

QUESTION FOUR (20MARKS)

a) Maseno University is undertaking a modernization programme which is composed of eight activities whose time estimate are listed in table 3 below. Activities are identified by their beginning (i) and ending (j) node numbers. Time are shown in weeks

Table 3

Activity	Time estimate		
	Optimistic	Most likely	Pessimistic
1 – 2	1	1	7
1 – 3	1	4	7
1 – 4	2	2	8
2 – 5	1	1	1
3 – 5	2	5	14
4 – 6	2	5	8
5 – 6	3	6	15
6 – 7	4	7	10

Required:

    i)   Draw the project network and identify the critical path   (**5marks**)
    ii) Find the expected duration and variance of each activity   (**5marks**)

b) The annual demand for material DM is 4,000 units and the purchase price is sh90 per unit. The incremental cost of processing an order is sh135 and the cost of storage is estimated to be sh12 per unit p.a. Determine:

    i)   The EOQ   (**5marks**)
    ii) The annual stock holding costs   (**3marks**)
    iii) The annual ordering costs   (**2marks**)

QUESTION FIVE (20MARKS)

a) Table 4 below shows the details of student enrolment in a college for three successive years. Use it to answer the questions that follow

Table 4

Year	Student Enrolment		
	Term 1	Term 2	Term 3
2008	1,500	1,300	1,050
2009	1,600	1,450	1,150
2010	1,750	1,650	1,300

    i)   Using least square method, determine the trend values   **(6marks)**

    ii) Using the multiplicative model, determine the seasonal variation for each term   **(6marks)**

    iii) Forecast the student enrolment for the year 2011   **(3marks)**

b) Work out the following integrals

  i. $\int\limits_{5}^{10}(100 - 2X)\partial x$ **(3marks)**

  ii. $\int\limits_{2}^{5}(3x + 10)\partial x$ **(2marks)**