JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF BUSINESS AND ECONOMICS

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELORS IN BUSINESS ADMINISTRATION WITH IT

3RD YEAR 2ND SEMESTER   2022/2023 ACADEMIC YEAR

KISUMU CAMPUS

COURSE CODE: BAB 1306 [ABA 315]

COURSE TITLE: QUANTITATIVE METHODS IN BUSINESS I

DATE:15/12/2022   SESSION: 9.00-11.00AM

TIME: 2 HOURS

INSTRUCTIONS:

i.   This paper contains **Five** questions

ii.   Answer question **ONE** and any other **TWO** questions

iii. Question one is **COMPULSORY**

iv.   Candidates are advised not to write on the question paper

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

QuestionOne (30 Marks):

a) Explain the difference between PERT and CPA as used in network analysis
[**3marks**]

b) Explain the main components of time series data. Which of these would be most prevalent in data relating to unemployment?
[**5marks**]

c) Highlight **FOUR** reasons why a business concern maintains inventory.
[**4marks**]

d) Explain **FOUR** advantages of a moving average method
[**4marks**]

e) Find the probability that during any 90 minute period, the number of patients arriving at the hospital accident and emergency department is:

    i.   Exactly 7   **[2marks]**
    ii.   At least 10   **[2marks]**

f) Highlight **FIVE** steps in decision making process
[**5marks**]

g) Explain **FIVE** network diagram drawing conventions   **[5marks]**

QuestionTwo (20 Marks):

The following matrix gives the payoff of different strategies (alternatives) A, B, and C against conditions (events) W, X, Y and Z.

	W	X	Y	Z
A	4,000	(100)	6,000	18,000
B	20,000	5,000	400	0
C	20,000	15,000	(2,000)	1,000

Identify the decision taken under the following approaches:

    (i)   Pessimistic
                   [5marks]
    (ii)   Optimistic   **[5marks]**
    (iii)   Equal probability   **[5marks]**
    (iv)   Regret   **[5marks]**

Question Three (20 Marks):

a) A research findings shows that only 40% of the professional employees in Kenya are employed in the actual areas of their career training. Based on this, determine the probability that among 10 randomly selected professionals employed in Kenya:

    i.   Exactly 4 are employed in their careers **[2marks]**

    ii. Between 1 and 3 inclusive are employed in their careers **[4marks]**

    iii. At least 4 are employed in their career
         [4marks]

b) Preso Pumps Limited uses about 75,000 valves per year and the usage is fairly constant at 6,250 per month. The valves cost Ksh.1.50 per unit when purchased in quantities and inventory carrying cost is 20% of the average inventory investment on annual basis. The cost to replace an order and to process the delivery is Ksh.18. It takes 45 days to receive from the date of an order and minimum stock of 3,250 valves is desired

Calculate:

    i.   Economic Order Quantity (EOQ) **[4marks]**

    ii. Number of orders in a year **[3marks]**

    iii. Re-order level **[3marks]**

Question Four (20 Marks):

a) A firm has analysed their operating conditions prices and costs and have developed the following following functions.

Revenue (R) = 4000 - 4Q2

Cost (C) = Q2 + 10Q + 30

Where Q is the number of units sold.

The firm wishes to maximization profit and wishes to know;

    i.   What quantity should be sold **[4marks]**

    ii. At what price **[3marks]**

    iii. What will be the amount of profit
         [3marks]

b) Given the activities of windmill project as have been code from A-K with duration and predecessors as shown below:

Activity Code	Duration	Predecessor

A	4	None
B	9	None
C	7	A
D	5	B
E	10	B
F	9	E
G	6	D
H	5	C
I	8	H
J	12	F, G
K	7	E

Required:

Construct the network diagram and hence find the project duration   [**10marks**]

Question Five (**20 Marks**):

a) The details of student enrolment in a college for three successive years is shown as under:

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
            [**2marks**]

   iii.   Forecast the student enrolment for the year 2011 in the college   [**2marks**]

b) Suppose that a door way being constructed is to be used by a class of people whose heights are normally distributed with a mean height of 70cm and a standard deviation of 3cm.

i. How high should the door be so that 25% of the people do not bump their heads? **[4marks]**

ii. If the height of the door is fixed at 76cm **[3marks]**

iii. How many persons out of 50,000 are expected to bump their heads? **[3marks]**