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(*Knowledge for Development)*

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS

2015/2016 ACADEMIC YEAR

FIRST YEAR FIRST SEMESTER

MAIN EXAMINATION

FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION

COURSE CODE: MBA 804

COURSE TITLE: QUANTITATIVE ANALYSIS

DATE: 11TH MAY, 2016 **TIME: 9.00 AM -12.00NOON**

INSTRUCTIONS TO CANDIDATES

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

QUESTION ONE (COMPILSORY)

(a) Explain the importance of set theory and probability in business (4mks)

(b) Outline the application of correlation and regression analysis in business (4mks)

(c) Income can be measured on several levels. Describe how income could be measured as an ordinal, interval and ratio measure. (3 mks)

d) The following data is a sample of the accounts received of a small merchandising firm

37	42	44	47	46	50	48	52	90
54	56	55	53	58	59	60	62	57
60	61	62	63	57	64	63	68	92
67	65	66	68	69	66	70	72	35
73	75	74	72	71	76	81	80	40
79	80	78	82	83	85	86	88	38

(i) Using class interval of 5 i.e 35-39; make a frequency distribution table(4mks)

(ii) Construct a Stem and Leaf diagram(4mks)

(iii)Calculate the mean, mode and median from the table in (a), hence comment about the symmetry(8 mks)

(iv)Find the standard deviation and coefficient of variation(4mks)

SECTION B (ANSWER ANY TWO QUESTIONS FROM THIS SECTION)

QUESTION TWO

Explain the importance of set theory in business (4marks)

By use of matrix algebra, develop the leontief inverse matrix.
(8marks)

Digital ltd manufactures and sells floppy disks at Nairobi industrial area. The average revenue (AR)(in thousands of shillings)of producing x floppy disks are given by the following functions

$ATC = \frac{1}{2}x^2 - \frac{5}{2}x + 50 + \frac{50}{x}$

And

$AR=800-2X^2$

Where: x is the number of floppy disks produced

Required:

The profit function (3marks)

The number of floppy disks required to maximize profit (3marks)

The maximum profit (2marks)

(Total: 20marks)

QUESTION THREE

A survey of undergraduate students at High Fliers University (HFU)showed the following results regarding gender and the fields of specialization in their studies

	Field of specialization			
Gender	Business	Science	Arts	Total
Male	100	250	100	450
Female	200	50	100	350
Total	300	300	200	800

Required

Determine if the field of specialization in the studies is dependent on gender (use significance level of 5%) (10marks)

An earlier survey showed that the proportion of female students taking science was only 10%of the total student population taking science .Does the data above show any significant improvement in the proportion of female students taking science (use a significance level of 5%) (6marks)

Charles Nzioka who is a barber has found out that he can shave on average 4 customers per hour .The arrival rate of customers averages 3customers per hour

Required

The proportion of time that Charles Nzioka is idle (1 mark)
The probability that a customer receives immediate service upon arrival (1mark)
Average number of customers in the queuing system (1 mark)
Average time a customer spends in the queuing system (1 mark)
(Total: 20marks)

QUESTION FOUR

a) Consider a problem, where five items are to be loaded on a vessel. The weight (W_i) and volume (V_i) of each unit of the different items as well as their corresponding returns per unit (r_j) are tabulated below.

Item i	W_i	V_i)	r_j
1	5	1	4
2	8	8	7
3	3	6	6
4	2	5	5
5	7	4	4

The maximum cargo weight (W) and volume (V) are given as 112 and 109 respectively. It is required to determine the optimal cargo load in discrete units of each items such that the total

return is maximized. Formulate the problem as an integer programming model.

(5 Marks)

b) Explain the following terms as used in operation research.

(i) Linear programming (1 Mark)

(ii) Transportation problem (1 Mark)

(iii) Assignment Problem (1 Mark)

(iv) Inventory problem (1 Mark)

(v) Game theory (1 Mark)

c) Solve the following LP problem using Simplex Method.

Maximize $z = 6x_1 + 8x_2$

Subject to

$$5x_1 + 10x_2 \leq 60$$
$$4x_1 + 4x_2 \leq 40$$
$$x_1 \quad and \quad x_2 \geq 0$$

(10 mks)

QUESTION FIVE

a. Differentiate between the additive model and the multiplicative model as used in time series analysis (4marks)

b. The sales data of XYZ Ltd (in millions of shillings) for the year 2001 to 2004 inclusive are given below.

	Quarter			
Year	1	2	3	4
2001	40	64	124	58
2002	42	84	150	62
2003	46	78	154	96
2004	54	78	184	106

Required

The trend in the data using the least square method (8marks)

The estimated sales for each quarter of the year 2004 (4marks)

The percentage variation of each quarter's actual sales for the year 2004 (4marks)

(Total: 20marks)