

**W1-2-60-1-6**

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

**University Examinations 2018/2019**

**FIRST YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF HUMAN RESOURCE MANAGEMENT**

**HBC 2110: MANAGEMENT MATHEMATICS I**

**DATE: DECEMBER, 2018 TIME: 2 HOURS**

INSTRUCTIONS: ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

**QUESTION ONE: 30 MARKS**

a. Discuss any four benefits of studying management mathematics.(4 marks)

b. Solve for X and Y given the following 4x-y=27 and -7x+6y=-26.(3 marks)

c. Solve for x in the equation 2(2x+3)- 2(x+4)=17(2x)-4 (4 marks)

d. Solve for Y in Log2y=log23+Log2 7+2Log2y. (3 marks)

e. Using matrix method solve the unknowns (5 marks)

 x +2y +z =18

 2x + y + 5z=16

 4x+2y+3z=18

f. Given that A=[a,b,g,h] B=[a,c,g,I,k] c=[c,g,h,k]

 determine the composition of the following relations

 i. AuB (2 marks)

 ii. AnB (2 marks)

 iii. AnBnc (2 marks)

 iv. (AuB) n (AuC) (2 marks)

g. Outline three uses of functions in business . (3 marks)

**QUESTION TWO: 20 MARKS**

MxJob industries Ltd produces two items Alon (x) and Balon (y). Each unit of x

requires in its production 30 units of raw material. A and 15 units of raw material

B. Each unit of Y requires 45 units of raw material A and 75 units of raw material

B. Three is a limited supply of only 1800 units of raw material A and 1425 units

of raw material B

Required:-

i. An equation, which expresses the number of units of x and y that can be produced using 1800 units of raw material A. (3 marks)

ii. An equation which expresses the number of units of x and y that can be produced using exactly 1425 units of raw material of B. (3 marks)

iii. By solving equations obtained in parts (i) and (ii) simultaneously determine the number of units of x and y which can be produced by using exactly 1800 units of raw material A and exactly 1425 units of raw material b. (7 marks)

iv. Suppose the unit process of x and y are sh. 10,000 and sh. 7,000 respectively whereas their respective variable production costs per unit are sh. 5,000 and sh. 4,900. Further, their combined fixed costs are 50,000. Determine the total profit that McJob Industries Ltd. will make given production levels obtained in part (iii) above. (7 marks)

**QUESTION THREE: 20 MARKS**

a. 100 people are asked about three brands of soft drinks A,B and C. 18 liked A only, 23 liked A but not B, 26 liked A, 8 liked B and C, 48 liked A and C while 54 liked one and only one of the three drinks.

 i. Draw a venn diagram to represent this information. (2 marks)

 ii. Find how many people liked B. (2 marks)

 iii. How many people liked all the three drinks. (2 marks)

b. A line L passes through the points (-2,3) and (-1 6) and is perpendicular to a line P at (-1,6)

 i. Find the equation of line L. (3 marks)

ii. Another line Q is parallel to L and passes through the points (1,2). Find the X- and Y- intercepts of line Q. (3 marks)

c. A consumption function is given by C=a + by where C is consumption and Y is income.

 i. What do the parameters a and b mean or measure. (2 marks)

ii. A student in JKUAT consumes Ksh. 750. When her income is Ksh. 1000, but decides to consume Ksh. 850. When her income is increased by 200. Determine the students consumption function. (4 marks)

**QUESTION FOUR: 20 MARKS**

a. What is Break Even Point (BEP) in the cost revenue analysis.

(2 marks)

b. Supply and demand functions for a certain product are P=Q2 + 25 and

P= -20Q + 550 respectively. Find the market equilibrium point.

(5 marks)

c. Gatheru and Kabiru HR Consultants have recently started to give Hr advice to their clients. Acting as consultants, they have estimated the demand curve of a client’s firm to be

 AR=200-8Q

 Where AR is average revenue in millions of shillings and Q is the output in units. Investigators of the client’s Firm’s cost profile shows that Morrginal cost (MC) is given by Mc=Q2-28Q + 211 (in millions of shillings). Further investigations have shown that the Firm’s cost when not producing output is sh. 10 million.

Required:-

i. The total cost function. (3 marks)

ii. The total revenue function. (2 marks)

 iii. The level of output that maximize profit. (8 marks)