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**JOMO KENYATTA UNIVERSITY**

**OF**

**AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2018/2019**

**YEAR I SEMESTER I EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN STRATEGIC MANAGEMENT**

**HBC 2110: MANAGEMENT MATHEMATICS I**

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

**INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS**

**QUESTION ONE (30 MARKS)**

1. Define the following terms as used in mathematics;
2. Universal set [1 mark]
3. Quadratic equation [1 mark]
4. Set [1 mark]
5. Inequalities [1 mark]
6. Cardinality of set [1 mark]
7. Solve the following inequalities 3x + 4 ≥ 5x + 2 [2 marks]
8. Use the quadratic formulae to solve the following equation;

 6x2 + 5x – 6 = 0 [4 marks]

1. Given that $Log\_{10}^{2}$ = 0.3010 and $Log\_{10}^{3}$ = 0.4771; compute the following without using a calculator;
2. $Log \_{10}^{6}$ [2 marks]
3. $Log\_{10}^{15}$ [3 marks]
4. Use the substitution method to solve the following equation;

 2x + y = 8

 3x – 2y = -2 [3 marks]

1. If A = {1,2,3,5,6,7} and B = {3,5,9} find;
2. A – B [2 marks]
3. B – A [ 2 marks]
4. Explain FOUR reasons why money has time value. [4 marks]
5. If f(x) = 4x5 + 3x4 x + 3, then find the derivatives of f(x). [3 marks]

**QUESTION TWO (20 MARKS)**

1. Consider the functions of f(x) = 2x + 3 and g(x) = x + 1

Find $\lim\_{x\to 1}\{5 f\left(x\right)+9\left(x\right)\}$ [4 marks]

1. Find the sum of the positive integers from 1 to 100 inclusive. [4 marks]
2. Use the completing square method to solve the following quadratic equation x2 + 6 – 7 = 0
3. A company receives Ksh.4500/= for each of unit of output sold. It has a variable cost of Ksh.2500 per item and a fixed cost of Ksh.160,000. What is its profit if it sells?

(i) 150 items [2 marks]

(ii) 200 items [2 marks]

1. If A = {0,1,3} and B = {a, b} Find;

(i) A x B [2 marks]

(ii) B x A [2 marks]

**QUESTION THREE (20 MARKS)**

1. Represent in Venn diagrams the following set operations;

(i) Union of A and B [3 marks]

(ii) Geometric series [3 marks]

1. Define the following terms;

(i) Arithmetic series [1 mark]

(ii) Geometric series [1 mark]

1. Solve the inequalities;

|3x + 4| ≤ 5 [3 marks]

1. Consider f(x) = 2x + 1 and g(x) = 3x Find g of x [3 marks]
2. Divide x4 – 3x3 + 2x – 5 by x2 – x + 1 [4 marks]
3. Solve the following exponential function 32x + 3x – 2 = 0 [2 marks]

**QUESTION FOUR (20 MARKS)**

1. Define the following terms;

(i) Empty set [1 mark]

(ii) Ordinary annuity [1 mark]

(iii) Annuity due [1 mark]

1. Find the sum of series 12 + 16 + 20 + ---------84 [4 marks]
2. Peterson repays a loan of Kshs.300,000 by paying Ksh.2000 in the first month and then increases the payment by Ksh.1500 every month. How long will it take to clear his loan? [5 marks]
3. Find the derivatives of the following functions;

(i) f(x) = x [1 mark]

(ii) f(x) = x8 [1 mark]

(iii) f(x) = x5/2 [1 mark]

1. In a class of 50 University freshmen 30 are studying French 25 are studying German and 10 are studying both languages. How many freshmen are studying either languages? [5 marks]