

 W1-2-60-1-6

**JOMO KENYATTA UNIVERSITY**

**OF**

**AGRICULTURE AND TECHNOLOGY**

 **UNIVERSITY EXAMINATIONS 2016/2017**

**YEAR I SEMESTER II EXAMINATION FOR THE DIPLOMA IN INFORMATION TECHNOLOGY**

**DIT 0205: ELEMENTARY MATHEMATICS AND DECISION MAKING TECHNIQUES**

**DATE: APRIL 2017 TIME: 1 ½ HOURS**

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

**QUESTION ONE (30 MARKS)**

1. If T = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10 } like the following subsets;
2. { the even number of T}
3. { the numbers MT which are divisible by 3} [4 marks]
4. Solve;

 3x + 5y = 23

 x + 4y = 3 [3 marks]

1. Factorize 2x2 + 6x + 4 = 0

 [3 marks]

1. At what point is the gradient of y = x2 + 3x + 2 equal to 9? [3 marks]
2. Given the arithmetic sequence 4, 11, 18…………., find the common difference and 6th term. [3 marks]
3. Which criteria of decision making is described by best case scenario. [1 mark]
4. Calculate the rate of interest if Ksh.45,000 earns Sh.500 after 1 year. [3 marks]
5. Integrate 2x3 – 5x + 1 [2 marks]

**QUESTION TWO (20 MARKS)**

1. Solve 2x2 + 3x – 7 = 0 [3 marks]
2. Use graphical method to solve;

 3x + 4y = 10

 2x – 3y = 1 [7 marks]

1. Use the graph of y = x2 + 3x + 1 to solve x2 + 3x + 1 [10 marks]

**QUESTION THREE (20 MARKS)**

1. The sum of the first three terms of a geometric series is 26. If the common ration is 3. Find the sum of the first six terms. [4 marks]
2. In an arithmetic sequence, the 15th term is 51 and the common difference is 3. Find;

(i) The first term

(ii) The 20th term [4 marks]

1. What would 15,000 amount to after 3 years at 16% p.a. compounded quarterly. [3 marks]
2. In the arithmetic series 1 + 4 + 7 + 10 ------------. Find the sum of the first;

(i) 10 terms

(ii) 100 terms [5 marks]

**QUESTION FOUR (20 MARKS)**

Consider the payoff table shown below in which entries are net dollar entries return. Assume that this is a decision with no knowledge about the states of nature;

 State of Nature

 Decision 1 2 3 4

 1 35 22 25 12

 2 27 25 20 18

 3 22 25 25 28

 4 20 25 28 33

1. What is the optimal decision if the Laplace criterion is used?
2. What is the optimal decision if the maximum criterion is used?
3. What is the optimal decision if the maximax criterion is used?
4. Create the payoff table in which the entries are regret.

**QUESTION FIVE (20 MARKS)**

The total revenue obtained in (£000) from selling X hundred them is a particular day is given by R, which is a function of variable X.

 Given that $\frac{dR}{dx}$ = 20 – 4x

1. Determine total revenue function R
2. Find the number of items sold in one day that will maximize the total revenue and

 hence evaluate this total revenue.