

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

**JOMO KENYATTA UNIVERSITY**

**OF**

**AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2015/2016**

**FIRST YEAR FIRST/SECOND SEMESTER EXAMINATION**

**FOR THE DIPLOMA IN COMMUNITY DEVELOPMENT**

 **SMA 1150: BASIC MATHEMATICS**

**DATE: DECEMBER 2015 TIME: 1 ½ HOURS**

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

**QUESTION ONE (30 MARKS)**

1. Express
2. 0.0001
3. 

into index (exponential) form with powers to base ten. [6 marks]

1. i) Write Log2 8 = 3 in exponential form. [3 marks]

ii) Write 5-3 =  in logarithmic form [3 marks]

1. Solve for x
2. x = log10 1000 [2 marks]
3.  [2 marks]
4. Simplify and solve for x if  [2 marks]
5. i) Expand and simply  [3 marks]

ii) By using laws of indices show that

  [3 marks]

1. Simplify
2. 
3. 

 [3 marks]

**QUESTION TWO (15 MARKS)**

1. Construct the graphs of
2. y = 2x-1 [2 marks]
3. y = 2x-1 [2 marks]
4. Use the graphs constructed in (i) and (ii) above to state the

relationship between the variables of x and y in both the

first function and the second function. [1 mark]

1. Divide P(x) = x3 -3x-2 + 6x - 8 by x-2 and hence find the

factors of P(x) [3 marks]

1. If H (x) = 11x3 -3x2 -2x+6

 R (x) = 3x2 + 3x +3 AND

M (x) = 6x4 – 4x3 +5x2 – 10x + 1, then find: H(x) – M(x) [4 marks]

1. If N (x) = -2x2 + 2x + 3 and L (x) = 5x THEN what is L(x) - N(x)? [3 marks]

**QUESTION THREE (15 MARKS)**

1. During the first sixteen days of the month of September, a community development worker received complaints on child abuse cases.

The following data shows ages (years) of children whose abuse

cases were brought to the worker.

1 2 3 8 4 11 12 2

 7 9 5 1 15 13 8 6

1. Group the data into classes beginning with a class

interval 1 - 4. [2.5 marks]

1. Construct a combined line and a histogram. The use the

graph to comment on nature of child abuse cases based on age. [2.5 marks]

1. Use the grouped data to state the mean, median and mode

 of ages of children abused. [2.5 marks]

1. State the variance and standard deviation of the data. [2.5 marks]
2. i) Compete the table below, then state the mean and the

 mathematical expectation . [3 marks]

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Class | Class markx | Frequencyf | f(x) | Probability or (Relative frequency)P(x) | x P(x) |
| 30 -3435 -39 |  | 21 |  |  |  |

 N =  

ii) Is there any difference between the mean  and the mathematical

 expectation ? [1 mark]

**QUESTION FOUR (15 MARKS)**

1. Evaluate  [5 marks]
2. There are five rates for a journey from station A to station B.

In how many ways can a man go to A to B and return, if for returning:

1. Any of the routes is taken [2 marks]
2. The same route is taken [1.5 marks]
3. The same route is not taken [1.5 marks]
4. i) Differentiate y = x2 without using the first principle [1.5 marks]

ii) Differentiate y = x2 by using the first principle [2 marks]

iii) Integrate x2 [1.5 marks]