

**MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY**

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**University Examinations 2014/2015**

FIRST YEAR, SPECIAL /SUPPLEMENTARY EXAMINATION FOR CERTIFICATE IN BRIDGING MATHEMATICS

**SMB 0004: PROBABILITY & STATISTICS**

**DATE: OCTOBER, 2015 TIME: HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***three*** *questions*

**QUESTION ONE - (30 MARKS)**

1. State two types of quantitative variables. (2 Marks)
2. Briefly explain three reasons behind sampling. (3 Marks)
3. Define the following terms: (6 Marks)
4. Frequency distribution
5. Median
6. Mode
7. Interquartile range
8. Mathematical expectation
9. Sample space
10. State two important properties of probability. (2 Marks)
11. Briefly explain the components of time series. (4 Marks)
12. Define the terms; (3 Marks)
13. Price index
14. Quantity index
15. Event outcome
16. The probability that it rains in any one day of the coming week is 0.73. Using the binomial formula, find the probability that;
17. It rains in exactly 5 days of the coming week (3 Marks)
18. There will be no rainy day in the coming week. (2 Marks)
19. The weight frequency distribution for randomly selected 108 Nairobi residents was as follows:

Weight (kg) Frequency

40 - 48 6

49 – 57 22

58 – 66 43

67 – 75 28

76 – 84 9

Calculate:

1. The modal class (1 Mark)
2. The median (4 Marks)

**QUESTION TWO (10 MARKS)**

The following table gives the distribution of marks for some students in Engineering exam.

Marks 31 – 40 41 – 50 51 – 60 61 – 70 71 -80 81 – 90

Frequency 2 5 9 21 13 10

1. Draw a histogram to represent this information. (5 Marks)
2. Represent the above information on a pie chart. (5 Marks)

**QUESTION THREE (10 MARKS)**

The probability that Alex passes his first exam in medicine course is 0.6. If he passes , the probability that he passes the second exam is 0.8.

If he fails the first exam, the probability that he passes the second exam is 0.4.

If he passes both exams the probability that he passes the third exam is 0.9 otherwise it is 0.05.

1. Draw a tree diagram that represents this information.
2. Use the tree diagram above to determine the probability that:
3. He passes the three exams
4. He passes only one of the exams
5. He passes at least one exam (10 Marks)

**QUESTION FOUR (10 MARKS)**

The number of deaths in hundreds of particular town for 1971- 1980 were as follows:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 |
| Population | 33 | 24 | 27 | 41 | 34 | 25 | 27 | 26 | 24 | 25 |

Show the 5-year moving averages of the deaths and plot the trend on the graph provided. (10 Marks)

**QUESTION FIVE (10 MARKS)**

The table below shows the distribution of goats farmers have in Isiolo County.

Goats 200 – 290 300-390 400-490 500-590 600-690 700-790

Farmers 3 8 15 20 14 5

Calculate;

1. The mean number of goats each farmer should have
2. The standard deviation (10 Marks)

**QUESTION SIX (10 MARKS)**

The table below gives the height in cm of some plants.

Height 149-154 155-160 161-166 167-172 173-178 179-184

Frequency 5 9 12 13 7 4

1. Draw the cumulative frequency (ogive) curve to represent the information above.

(5 Marks)

1. Determine the interquartile range of the data above. (3 Marks)
2. Determine the value of K, if the height of the Kth plant was 162cm. (2 Marks)