

**MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY**

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**University Examinations 2015/2016**

FIRST YEAR , FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN FOOD SCIENCE AND MANAGEMENT, FOOD SCIENCE AND TECHNOLOGY, HUMAN NUTRITION AND DIETETICS, BACHELOR OF SCIENCE IN AGRICULTURE, BACHELOR OF SCIENCE IN HORTICULTURE, BACHELOR OF SCIENCE IN AGRICULTURAL EXTENSION AND EDUCATION AND BACHELOR OF SCIENCE IN ANIMAL HEALTH AND PRODUCTION

**SMF 3111: MATHEMATICS I**

**DATE: November, 2015 TIME: HOURS**

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

**QUESTION ONE – (30 MARKS)**

1. A farmer takes 8 days to cultivate a plot f land 1½ha in area. What area of land will be cultivated in 20 days at the same rate? (3 Marks)
2. Simplify  by expressing with a rational denominator. (3 Marks)
3. Solve the equation for x (5 Marks)
4. Find the possible value of c if the equation has equal roots. (4 Marks)
5. How many ways can a customer at the supermarket select 3 different types of sodas from 30 available types and 10 different types of biscuits from 12 different available packets.. (3 Marks)
6. An arithmetic progression has fourth term 22 and eighth term 46. Find the first term and the common difference. (3 Marks)

1. If (3x – 1 ) is a factor of find the value of a in the equation,

 (4 Marks)

1. In the figure below O is the centre of the circle and angle AOB= 100. Arc APB=5Calculate the exact value of the radius of the circle. (3 Marks)

 

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1. Two fair six faced dice are thrown and the events A,B an defined as follows;

 A: The score on the topmost face of the first die is 5

 B. The sum of the scores on the topmost faces of both dice is at least nine

1. Prepare a table to show all the possible outcomes. (2 Marks)
2. Find P(A) and P(AvB) (2 Marks)

**QUESTION TWO (20 MARKS)**

1. For the following frequency

|  |  |
| --- | --- |
| Height (m) | Number of plants |
| 40 – 4445-4950-5455-5960-64 | 61025118 |

 Calculate;

1. Mean (5 Marks)
2. Standard deviation (5 Marks)
3. According to an agriculturalist genetic theory a fresian bull and arshire cow have a constant probability of 0.8 of producing a fresian calf. In a small firm , the bull is fresian and all the cows are arshire. Four calves are born during one month.
4. Draw a tree diagram to represent this information . (12 Marks)
5. Determine to three decimal places;
6. The probability of producing exactly 4 fresian claves. (2 Marks)
7. The probability of producing at least 2 fresian calves. (2 Marks)
8. Probability of producing no fresian calve (2 Marks)
9. Probability of producing at most one fresian calves (2 Marks)

**QUESTION THREE ( 20 MARKS**)

1. (i) If a:b=2:5 b:c = 4:3 Find a:c (2 Marks)

(ii) Three people A,B and C can do a piece of work in 45 hours, 40 hours and 30 hours respectively. How long can B take to complete the work when he starts after A and C have worked for 13 hours each. (5 Marks)

1. Solve the equation = 10 giving your answer correct to 3 decimal places.

 (4 Marks)

1. A box contains 5 red, 2 white and 3 blue balls. How many arrangements are possible if;
2. All ten balls are arranged in a row. (3 Marks)
3. Any four are taken and arranged in a row. (3 Marks)
4. Expand up to and including the term
5. in ascending powers of x and simplify your answer. (2 Marks)
6. With evaluate correct to four decimal places.(2 Marks)

**QUESTION FOUR (20 MARKS)**

1. A surveyor measures the three sides of a triangular field XYZ as XY=65.5m,YZ= 56.7M and XZ AS 48.9M.Calculate the area of the field correct to the nearest square metre

 (4 Marks)

1. In triangle PQR P = 6.05 cm q = 3.65cm and R = 37.50. Find angle RQP (4 Marks)

 

c) Solve the quadratic equation (3 Marks)

d) In a geometric progression, the third term is 81 and the sixth term is 3. Determine the first term and the common ratio. (4 Marks)

e) If x – 2 is a factor of the polynomial . Find the possible values of a and the other factors using the smaller value a. (5 Marks)

**QUESTION FIVE (20 MARKS)**

1. Determine the median and the semi-interquartile range of the data 7.5, 10, 5, 3, 2, 9, 8, 7.4, 5, 8.5, 9.5 (4 Marks)
2. Simplify without using tables. (3 Marks)
3. Determine the value of k for which the equation has no roots.

(4 Marks)

1. A customer makes a single deposit of 16,000 in an account which pays a compound interest at the rate of 6% per annum. How much is the investment worth after 24 months.(3 Marks)
2. A chord AB divides a circle of radius a cm into two segments. If AB subtends an angle of 450 at the centre of the circle, show that the area of the minor segment if

 (6 Marks)

 