

**MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY**

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**University Examinations 2015/2016**

THIRD YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE BIOLOGICAL , BACHELOR OF SCIENCE CHEMISTRY AND BACHELOR OF SCIENCE IN CROP PROTECTION

**SZL 2304/2300: BIOSTATISTICS**

**DATE: November, 2015 TIME:** $2 $**HOURS**

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

**QUESTION ONE - (30 MARKS)**

1. Give three sources of biological variation. (3 Marks)
2. Explain the following terms;
3. Quantitative data (1 Mark)
4. Confidence interval (1 Mark)
5. Non-parametric statistics (1 Mark)
6. XYZ Ltd is a firm specializing in the sales of the following products;

Product Sales (sh. 000’s)

A 200

B 150

C 100

D 150

Represent the above information using a pie chart. (5Marks)

1. From the following anova table compute sum of square of treatments. (4 Marks)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | t1 | $$t\_{2}$$ | $$t\_{3}$$ | $$t\_{4}$$ | $$t\_{5}$$ | Total |
| $$B\_{1}$$ | 5 | 8 | 7 | 7 | 8 | 35 |
| $$B\_{2}$$ | 4 | 6 | 6 | 3 | 5 | 24 |
| $$B\_{3}$$ | 6 | 4 | 4 | 5 | 4 | 23 |
| $$B\_{4}$$ | 7 | 4 | 6 | 6 | 5 | 28 |
|  | 22 | 22 | 23 | 21 | 22 | 110 |

1. Given the following data;

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Marks | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 |
| Frequency  | 5 | 15 | 20 | 25 | 10 | 4 | 2 |

 Compute;

1. Median (4 Marks)
2. Mode (4Marks)
3. Variance (4 Marks)
4. Standard deviation (3 Marks)

**QUESTION TWO (20 MARKS)**

1. Using the data given below;

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Marks | 5-15 | 15-25 | 25-35 | 35-45 | 45-55 | 55-65 |
| No. of Students  | 5 | 20 | 15 | 45 | 10 | 5 |

Compute:

1. Mean (3 Marks)
2. The mode (3 Marks)
3. Given the set of data below;

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| x | 10 | 15 | 18 | 1 | 4 | 7 | 14 |
| y | 3 | 2 | 0 | 8 | 6 | 4 | 3 |

1. The correlation coefficient (6 Marks)
2. The coefficient of determinant (r2) (2 Marks)
3. Comment on the relationship between x and y (1 Mark)
4. Determine $\overbar{x}$ and $\overbar{y}$ , a and b for the equation $y=a+bx$ (5 Marks)

**QUESTION THREE (20 MARKS)**

The lengths to the nearest centimeter of 50 trees in a forest were as follows;

165 170 182 169 165 180 182 175

180 184 174 186 175 175 186 180

174 183 172 167 168 158 188 190

135 148 159 148 182 163 140 145

156 158 155 147 143 142 138 150

160 156 140 148 158 165 180 175

184 168

a) Using interval of 10 make a frequency distribution table. (6 Marks)

b) From the table

1. State the modal class (1 Mark)
2. Compute mean and the median (7 Marks)
3. The quartile deviation (3 Marks)
4. Draw histogram from the above data. (3 Marks)

**QUESTION FOUR (20 MARKS)**

Construct anova from the following table given below: (20 Marks)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | t1 | $$t\_{2}$$ | $$t\_{3}$$ | $$t\_{4}$$ | Total |
| $$B\_{1}$$ | 5 | 10 | 15 | 12 | 42 |
| $$B\_{2}$$ | 3 | 6 | 19 | 14 | 42 |
| $$B\_{3}$$ | 2 | 14 | 16 | 18 | 50 |
| Total  | 10 | 30 | 50 | 44 | 134 |

**QUESTION FIVE (20 MARKS)**

1. Distinguish between confidence intervals and confidence limits. (2 Marks)
2. Explain the term variation in biology. (2 Marks)
3. Give three causes of variation in biology. (3 Marks)
4. From the table compute;
5. Sum of squares (SSF) (5 Marks)
6. Mean square for treatments (5 Marks)
7. Sum of error of squares or Error sum of squares.(SSE) (3 Marks)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | t1 | $$t\_{2}$$ | $$t\_{3}$$ | $$t\_{4}$$ | $$t\_{5}$$ | $$t\_{6}$$ | Total |
| $$B\_{1}$$ | 7 | 8 | 15 | 11 | 9 | 10 | 60 |
| $$B\_{2}$$ | 12 | 17 | 13 | 18 | 19 | 15 | 94 |
| $$B\_{3}$$ | 14 | 18 | 19 | 17 | 16 | 18 | 102 |
| $$B\_{4}$$ | 19 | 25 | 22 | 23 | 18 | 20 | 127 |
| Total  | 52 | 68 | 69 | 69 | 62 | 63 | 383 |