



EMBU UNIVERSITY COLLEGE
(A CONSTITUENT COLLEGE OF THE UNIVERSITY OF NAIROBI)
FIRST SEMESTER EXAMINATIONS 2014/2015

THIRD YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE
(BIOLOGY)

SZL 303: BIOSTATISTICS

DATE: DECEMBER 8, 2014

TIME: 16:00 – 18:00

INSTRUCTIONS:

ANSWER ANY TEN (10) QUESTIONS (7 MARKS EACH)

1. Distinguish between quantitative and qualitative variables.
2. Distinguish between nominal and ordinal scales of measurements.
3. Explain three methods of collecting primary survey data.
4. Outline the methods of presenting biological data.
5. Outline the steps of biological research process.
6. The minimum and the maximum of the monthly salaries paid to unskilled laborers in a large agricultural enterprise are 8,000 and 40,000ksh, respectively. The frequency distribution of the monthly salary of the employees is shown in the table below. Determine the arithmetic mean.

Frequency distribution of monthly salary

Monthly salary (Ksh)	No. of employees
8000 - 12,000	400
12,000 - 16,000	360
16,000 - 20,000	325
20,000 - 24,000	250
24,000 - 28,000	200
28,000 - 32,000	150
32,000 - 36,000	75
36,000 - 40,000	25

7. Consider two fish farms with equal initial investments and similar management. Identify the farm which is more consistent in fish production, using the following data collected over a 5-month period.

Fish production

Period	1	2	3	4	5
Farm A	80	85	70	100	115
Farm B	100	70	90	90	150

8. State the statistical tests appropriate for the following scenarios.
- Tests of differences between means of two large samples.
 - Tests of differences between means of more than two samples.
 - Tests of association between two variables for measurements at categorical level.
 - Tests of differences between medians of more than 2 samples.
 - Tests of differences between medians of 2 samples.
 - Prediction of one variable from another.
 - Testing of association between an observed frequency and an expected frequency.
9. Distinguish between a one-tailed and a two-tailed tests.
10. State the characteristics of non-parametric tests.

11. A biologist wishes to investigate the flower colour of cow peas in two localities, one chalky and the other sandy. In the chalky area, he examines 60 bushes and finds that 20 were pink and 40 blue, whereas of 90 bushes from the sandy area, 70 were pink and 20 blue. Test the hypothesis that there is no association between soil types and flower colour.
12. Using an appropriate transformation method, calculate the standard deviation for the proportional data given below.

Proportional data

0.25, 0.31, 0.21 0.24, 0.30, 0.29, 0.22

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