



K25P 3583

Reg. No. :

Name :

**I Semester M.Sc. Degree (CBCSS – OBE – Reg./Supple./Imp.)
Examination, October 2025
(2023 Admission Onwards)
ZOOLOGY/ZOOLOGY (Structure, Physiology, Development and
Classification of Animals)
MSZNG01 C02/MSZGY01C02 : Biophysics and Biostatistics**

Time : 3 Hours

Max. Marks : 60

PART – A

Answer **any five** of the following. **Each** question carries **3** marks. **(5×3=15)**

1. What is the primary principle behind confocal microscopy ?
2. What is the main purpose of using a density gradient in centrifugation ?
3. What is the fundamental property of a nucleus that allows it to be studied using NMR spectroscopy ?
4. What is the main biological application of echocardiography ?
5. What is the key advantage of using a sampling method over a census method for data collection ?
6. Describe the primary purpose of a one-way ANOVA.

PART – B

Answer **any three** of the following. **Each** question carries **6** marks. **(3×6=18)**

7. Justify why High Voltage Electrophoresis would be the preferred method for separating small, charged metabolites and predict the potential pitfalls if not handled correctly.
8. Explain how a Liquid Scintillation Counter detects and measures low-energy radioactive isotopes.

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9. Evaluate the utility of fMRI compared to a traditional PET scan for mapping cognitive functions in the human brain, considering factors like resolution and safety.
10. Create a set of guidelines for a researcher to decide between using simple random sampling and stratified random sampling when studying a population with distinct subgroups.
11. Formulate the simple linear regression equations for Y on X and X on Y, and define the terms within them.

PART – C

Answer **any three** of the following. **Each** question carries **9** marks. **(3×9=27)**

12. Analyse the advantage of using pulsed-field gel electrophoresis over standard gel electrophoresis for the separation of entire chromosomes from yeast.
 13. Compare the principles of X-ray crystallography and NMR spectroscopy for determining protein structure, analysing one key advantage and one limitation of each technique.
 14. Compare the use of Pearson's correlation coefficient and Spearman's rank correlation.
 15. Elaborate on the Chi-square test for goodness of fit, explaining its calculation and interpretation with a suitable biological example.
 16. Calculate and interpret the Arithmetic Mean, Median and Mode for the biological data set of newborn mouse weights : (12, 15, 14, 13, 16, 15, 14, 17, 15, 13), discussing the suitability of each measure.
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