SEMESTER – II
METHODOLOGY AND PERSPECTIVES IN PLANT SCIENCES
Course Code: BO1221

I. Write a short note on the following. All questions compulsory. (10 x 01 = 10)

1. Primary Data
2. Empirical Knowledge
3. Range
4. Pictogram
5. Buffer
6. Median
7. Null hypothesis
8. PAGE
9. DPX
10. A Killing agent
11. Pure Science and Applied Science
12. Pie diagram
13. Practical Knowledge
14. Histogram
15. Ordinal Data
16. Empiricism
17. Adhoc Hypothesis
18. Corroboration
19. Pseudoscience
20. Continuous variables
21. Scientific statement
22. Induction
23. Mean
24. SEM
25. AGE

II. Answer any eight (8 x 2 = 16 marks)

1. What do you understand by scientific temper?
2. What are dangers of preconceived ideas in scientific research?
3. What is a scientific theory? Give one example.
4. Give four example of model organisms used in biological research?
5. What are the features of a good and valid hypothesis?
6. Differentiate primary and secondary data?
7. What is the importance of documentation and record keeping in scientific research?
8. Explain qualitative data with example.
9. Differentiate scientific theory and Scientific law.

10. “Science does not rest upon solid bed rock, its building erected on piles” is this statement true or false? Give reason for your answer.
11. What do you understand by chronological classification of data?
12. What is the significance of tabulation in treatment of statistical data?
13. Why are samples used in research? What is meant by “representative data”?
14. “Science can never be truly objective”- Why?
15. Give the role of Enumerator.
16. What are different types of knowledge?
17. Describe parts of table.
18. Write different sources of secondary data?
19. Write notes on Camera Lucida.
20. Give the principle of Beer Lamberts Law.
21. Write notes on double staining.
22. What is range? How it is calculated?
23. What are the steps involved in maceration?
24. What is standard deviation?
25. Why sharing of knowledge is essential?
26. Comment on transparency and honesty in science.
27. Differentiate Primary and Secondary source of information.

III. Answer any six (6 x 4 = 24 marks)

1. Write a note on revolution in modern science.
2. What are the different types of knowledge.
3. Hypothesis, theory and law, these words does not mean the same thing and cannot be used interchangeably is this statement true or false? Explain your answer.
4. What is the necessity of using controls in an experiment? Explain with complete the positive and negative controls used in an experiment.
5. Differentiate simulation and virtual testing used in science.
6. Explain hypothetico-deductive model formulation of a hypothesis.
7. Describe with examples inductive and deductive logic.
8. Cell theory states that all the living things are made up of cells. Why this theory is not considered as law?
9. “Ogives are unique type of presenting data” – Explain.
10. “There is no need for hypothesis generation to be a logical process”. Discuss.
11. Why is critical thinking so important so important for the progress of science?
12. What is meant by the phrase “Science is theory – laden”?
13. What distinguishes science from other approaches of gaining knowledge?
14. "There is no need for hypothesis generation to be a logical process." Discuss.
15. What is the significance of ethics in science?
16. Differentiate inductive and deductive reasoning.
17. Briefly describe about the working of a phase contrast microscope.

18.What are the applications of SEM and TEM.
19.Write brief notes on different types of stains.
20. Differentiate PAGE and AGE.
21. Write brief notes on Chi square test.
22. Briefly explain the uses and applications of cryobiology.
23.Write notes on centrifugation and different types of rotors.

IV. Write essay on any two of the following. (2 x 15 = 30 marks)

1.What is meant by ethics in science? Discuss the need for applying ethics in scientific research. Write a note on different ethical principles a researcher should follow while doing research.
2.Why is data represented diagrammatically and graphically? What are its advantages? Explain the different methods of diagrammatic and graphic representation of data.
3. Explain the different steps in the Scientific method used in science.
4. Write a note on different types of experiments. Give a detailed account on how an experiment can be designed.
5. Describe various methods of classification of data.
6. How do graphs help in the presentation of research findings?
7. Explain different methods of samplings.
8. Write notes on the process of killing and fixing and briefly describe the process of microtome sectioning.
9. Explain the methods of data collection and possible ways of its representation.
10. Explain different separation methods for biological molecules.
11. Discuss science as a human activity. Add notes on major revolutions in science and technology.

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