Reg. No. : ....

Name : ....

Ph.D. ENTRANCE EXAMINATION 2023

FACULTY OF SCIENCE

BOTANY

Time : 3 Hours   Max. Marks : 100

***Instructions* :**

1) Answer **any ten** questions each from Section **A** and **B.**
2) Each question carries **5** marks.
3) No additional Answer sheets will be provided.
4) Candidates should clearly indicate the section, Question number in the answer booklet.

Section – A

Research Methodology

Answer any **ten** questions. Each questions carries **5** marks.

1. Explain the difference between applied research and fundamental research. Which type of research are you interested in? Why?

2. What is meant by 'Review of literature'? Explain its importance. What are primary and secondary sources?

3. Explain the difference between the Student's T-test and ANOVA. Give examples of your choice for both.

4. What is the importance of post hoc analysis? Name any two post hoc analyses and explain their differences.

5. Suppose you want to do research on a particular topic and you want to avail the Government for project funding, for which you have to write a research proposal. You will get funding only if your proposal is convincing. Explain the important components of a good research proposal. Explain using a suitable example of your choice.

6. Differentiate between the three sections, 'Introduction', 'Results', and 'Discussion' of a thesis. Explain using a suitable example of your choice.

7. Using any examples of your choice, explain how to cite a research article, a book chapter, and a website. Is it possible to know, how many times, and where a research article has been cited? How?

8. Describe the repeatability, reproducibility, and reliability of experiment results. Why are these important?

9. What is plagiarism? What are its types? What are the consequences if a research article or thesis is caught in the act of plagiarism?

10. What is Patenting? Why is it important? Explain different types of patents.

11. What is the difference between an Oral presentation and a Poster presentation? What are the important points that make presentations attractive and complete?

12. Name and explain any four types of microscopes.

13. Under what circumstances should we use a line graph, a pie chart, and a bar graph? Draw diagrams for these with any examples of your choice.

14. Write the important requirements of a good Powerpoint presentation. What are its advantages and limitations?

15. Explain the difference between qualitative research and quantitative research. Explain examples of your choice for both.

(10 × 5 = 50 Marks)

Section – B

Botany

Answer any **ten** questions. Each question carries **5** marks.

1. Name any five crops grown in your state. What are the major disease-causative agents in these crops?

2. What is a phylogenetic tree? How is it generated? What are its applications? Draw a hypothetical phylogenetic tree.

3. Explain the salient features of real-time PCR. What are its applications?

4. Explain direct and vector-mediated methods of gene transfer in plants.

5. What is the difference between genetic engineering and genome editing?

6. Explain the importance of molecular tools in taxonomical research.

7. What are phytohormones? Name five phytohormones, and explain their effect on plants.

8. What are secondary metabolites? What is their function in plants?

9. Name five commercially important secondary metabolites, their source and applications.

10. Explain any four chromatographic methods.

11. Explain the differences between Southern blotting and Western blotting techniques.

12. Explain the difference between fluorescence, phosphorescence, chemiluminescence, and bioluminescence.

13. What are the differences between a biocontrol agent and a plant growth promoting microbe? Name any two examples under each of these categories.

14. Explain the ecological significance of marine and fresh water algae.

15. Describe different types of forest vegetations.

(10 × 5 = 50 Marks)
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