 PG/IVS/BOT/402.1 & 402.2/25

M.Sc. 4th Semester Examination, 2025

BOTANY

PAPER – BOT-402.1 & 402.2

Full Marks : 50

Time : 2 hours

Answer **all** questions

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

BOT – 402.1

(*Instrumentation and Biostatistics*)

GROUP – A

Answer any **two** questions : 2×2

1. Write down the role of grid in TEM.

2. What is the principles of GEL electrophoresis ?

3. Write down the role of Taq and $MgCl_2$ in PCR mixture.

4. What do standard deviation and standard error express ?

GROUP – B

Answer any **two** questions : 4×2

5. Differentiate the mechanism and functions of a colorimeter and a spectrophotometer.

6. Mention different applications of TLC. Discuss its stationary and mobile phases. $2 + 2$

7. Write down the principle and applications of Scanning Electron Microscope.

8. Illustrate the positions of mean, median and mode in normal, positively skewed and negatively skewed distribution.

GROUP – C

Answer any **one** question : 8×1

9. Write down two applications each of the following instruments :

(*a*) Nuclear Magnetic Resonance Spectroscopy;

(*b*) Ultracentrifuge;

(*c*) Rotary evaporator;

(*d*) HPTLC.

10. Write down in detail about SDS-PAGE & NATIVE electrophorectic system.

BOT – 402.2

(*Bioinformatics*)

GROUP – A

Answer any **two** questions from the following : 2×2

11. What are the major components of bioinformatics ?

12. Name any two data mining tools used in bioinformatics.

13. Why is homology modelling also called comparative modelling ?

14. What is meant by melting temperature (Tm) ?

GROUP – B

Write short notes on any **two** from the following : 4×2

15. PrimerZ software;

16. Nucleic acid databases;

17. Application of multiple sequence alignment;

18. Methods of gene prediction.

GROUP – C

Answer any **one** question from the following : 8×1

19. Write short notes on Restriction site annotation and ORF Finder. 4 + 4

20. What is phylogenetic analysis in bioinformatics ? What type of bioinformatic tools are used for this purpose ? Mention any two methods applied for phylogenetic analysis. 4 + 2 + 2

[Internal Assessment — 10 Marks]