



PG (CBCS)
M.Sc. Semester-IV Examination, 2026
BOTANY
PAPER: BOT 405C
(CYTOLOGY, MOLECULAR BIOLOGY & BIOTECHNOLOGY: MOLECULAR
BIOLOGY & BIOTECHNOLOGY)

Full Marks: 40

Time: 2 Hours

The figures in the right-hand margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable.

- A. Answer any **FOUR** of the following questions: 2×4=8
1. What is genome imprinting? Which human disease is associated with genome imprinting?
 2. What is ribozyme? Mention its utility.
 3. Differentiate qRT PCR and RT PCR.
 4. Differentiate between molecular taxonomy and phenetics.
 5. What is T_m value? How is it calculated?
 6. Mention the importance of pedigree selection.
- B. Answer any **FOUR** of the following questions: 4×4=16
7. Write a short notes on herbicide resistance through transgenesis with suitable example.
 8. Give a short note on microarray techniques.
 9. Differentiate snRNA and snoRNA. Briefly describe their mechanism. 1+3
 10. Give a short note on molecular farming. 4
 11. Briefly describe the procedure of synthetic seed production and mention its importance. 3+1
 12. Define half diallele. Briefly describe the procedure of diallele crossing.
- C. Answer any **TWO** of the following questions: 8×2=16
13. Briefly describe the significance of *vir* regulon for T DNA transfer to plant cell. Define disarmed Ti plasmid. Differentiate binary and co integrate vector. 5+1+2
 14. Mention the factors affecting the suspension culture. Differentiate batch culture and continuous culture. Mention the importance of bioreactor for secondary metabolite production. Schematically represent the procedure of *in vitro* secondary metabolite production. 2+1+3+2
 15. What is RNAi technique. Briefly describe the function and application of siRNA and micro-RNA. 2+3+3
 16. What is CRISPR? What is PAM site? What is g RNA? Describe the process of CRISPR-cas9 genome editing with suitable illustration. 1+1+1+5

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