

Roll No: _____

M. Sc. Botany, Semester-II Examination, 2023

Paper Title: Tools and Techniques in Biology

Paper Code: MBO-GE201

Time: 2^{1/2} h

Max Marks: 60

Note: This paper has 03 Sections, A, B, and C. Attempt all three sections.

Section A (Attempt all questions)

(1x10=10 Marks)

Q. No	Questions	BTL	CLO	PLO
i.	How many bands are expected when a typical plasmid DNA is electrophoresed and viewed under UV?	4	2	3
ii.	What is the common dimension between 1-D PAGE and 2-D PAGE?	2	2	3
iii.	Centrifugation is based on sedimentation. State whether the statement is TRUE Or FALSE.	2	5	2
iv.	What is retention factor?	1	4	3
v.	What is SCOT in gas chromatography?	1	3	2
vi.	List few detector used in HPLC	5	4	3
vii.	What is the wavelength range of the UV spectrum?	4	4	3
viii.	What is Lambert Beer Law?	4	4	3
ix.	Use of electromagnet in mass spectrometer.	3	2	3
x.	Use of freeze fracture.	2	2	3

Section B: Long type Questions (Attempt any TWO out of four)

(2x15=30 Marks)

Q. No	Questions	BTL	CLO	PLO
a)	Bring out significant differences between agarose gel electrophoresis and PAGE in terms of their respective a. Principles b. Nature of separation media/matrix b. Applications	3	2	3
b)	Describe the principle, techniques and application of high performance liquid chromatography (HPLC)	5	3	2
c)	What is spectrophotometry? Explain the principle, operational procedure and application of Flame photometry.	2	2	3
d)	Write a note on electron microscopy explaining its working principle, operational procedure and applications	1	1	2

P.T.O.

Section C: Short-type Questions (Attempt all questions, each question has an internal choice)
(4x5=20 Marks)

Q. No	Questions	BTL	CLO	PLO
a)	Differentiate between rate zonal centrifugation and isopycnic centrifugation OR Write notes on ultracentrifugation and its application	4	5	3
b)	Write short notes on reverse phase chromatography OR Elaborate the working principle of thin layer chromatography	3	2	3
c)	List the applications of mass spectrometry OR The working of UV/Visible spectrophotometer	4	3	2
d)	What is light microscopy? Mention its operational procedure with suitable illustrations OR Differentiate between fixation, and staining with suitable examples	2	2	3

END OF THE QUESTION PAPER