19. (a) Write a note on Pulse field gel electrophoresis.

Or

(b) Explain the principle behind rocket immune-electrophoresis.

20. (a) What are the steps involved in DNA isolation?

Or

(b) Write short notes on colony hybridization.

SECTION C — (3 × 10 = 30)

Answer any THREE questions.

21. Explain in detailed about the principle, techniques and applications of TEM.

22. What is the principle behind centrifugation? And explain its types in detail.

23. Write the principle, preparation of column, adsorption and elution of gel permeation chromatography.

24. Explain in detail about the counter current electrophoresis.

25. Explain in detail about the chemical method of gene transfer mechanisms.

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S.No. 3212 **P 22 MBEIA**

(For candidates admitted from 2022–2023 onwards)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Microbiology – Elective

BIOLOGICAL TECHNIQUES

Time : Three hours Maximum : 75 marks

SECTION A — (20 marks)

Answer ALL questions.

I. (A) Multiple choice questions : (5 × 1 = 5)

1. Resolving power of a microscope is a function of ———————

(a) Wavelength of light used
(b) Numerical aperture of lens system
(c) Refractive index
(d) Wavelength of light used and numerical aperture of lens system

2. What is rate-zonal centrifugation?

(a) Based on separation of particles by mass
(b) Based on separation of particles by density
(c) Based on separation of particles on solubility
(d) Based on separation of particles on size

3. In chromatography, which of the following can the mobile phase be made of?
   (a) Solid or liquid (b) Liquid or gas
   (c) Gas only (d) Liquid only

4. In SDS- PAGE separation is based on
   (a) Molecular weight
   (b) Shape
   (c) Charge
   (d) All of the above

5. DEAE-dextran stands for
   (a) Diethylaminoethyl dextran
   (b) Dimethylethylene-dextan
   (c) Diaminomethyl-dextran
   (d) Diazoethyl dextan.

(B) Fill in the blanks : (5 × 1 = 5)

6. The NA value of an oil immersion objective lens is _____.

7. The other name for zonal centrifugation is _____.

8. In chromatography, the term chroma means _____.

9. The most common type of gel used for DNA separation is _____.

10. Maximum size of foreign DNA that can be inserted into a replacement vector is _____.

II. Answer ALL questions : (5 × 2 = 10)

11. Microscopy.

12. Biosensors.

13. How the Rf value is calculated?

14. Isoelectric point.

15. Restriction digestion.

SECTION B — (5 × 5 = 25)

Answer ALL questions, choosing either (a) or (b).

16. (a) Write short notes on bright field microscope.

Or

(b) Write the steps involved in the preparation of specimen for microtome.

17. (a) Write short notes on radioactivity.

Or

(b) Write short notes on potentiometric titration.

18. (a) Describe the ion- exchange chromatography.

Or

(b) Explain briefly about the Gas chromatography.