

**2025/FYUG/EVEN/SEM/
BTCDSC-251/179**

FYUG Even Semester Exam., 2025

BIOTECHNOLOGY

(4th Semester)

Course No. : BTCDSC-251

(Bioanalytical Tools)

Full Marks : 70

Pass Marks : 28

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

UNIT—I

1. Answer any *two* of the following questions :

2×2=4

- (a) Write a note on simple microscopy.
- (b) Write down the applications of phase-contrast microscopy.
- (c) Write about pH meter.

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(Turn Over)

(2)

2. Answer any *one* of the following questions : 10

- (a) What is an electron microscope? Write down the principle and instrumentation of SEM. Differentiate between light microscopy and electron microscopy.

1+6+3=10

- (b) Write notes on :

5+5=10

- (i) Fluorescence microscopy
(ii) TEM

UNIT—II

3. Answer any *two* of the following questions :

2×2=4

- (a) What is atomic absorption spectroscopy?
(b) Write about Beer-Lambert law.
(c) Write a note on infrared spectrophotometer.

4. Answer any *one* of the following questions : 10

- (a) Write down the principle, working and application of UV spectrophotometer.

2+6+2=10

- (b) Write notes on :

5+5=10

- (i) Atomic emission spectroscopy
(ii) Colorimeter

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(Continued)

(3)

UNIT—III

5. Answer any *two* of the following questions :

2×2=4

- (a) Define sedimentation coefficient.
- (b) What are the basic components of a centrifuge?
- (c) Write down the applications of centrifugation.

6. Answer any *one* of the following questions : 10

- (a) Give a detailed account on isolation of sub-cellular organelles and particles.
- (b) Write notes on : 5+5=10
 - (i) Types of rotors in a centrifuge
 - (ii) Density gradient centrifugation

UNIT—IV

7. Answer any *two* of the following questions :

2×2=4

- (a) Write down the principle of paper chromatography.
- (b) Write a note on gel-filtration chromatography.
- (c) What is the principle of affinity chromatography?

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(Turn Over)

(4)

8. Answer any *one* of the following questions : 10

(a) Write down the principle and procedure of thin-layer chromatography. Add a note on gas chromatography. 6+4=10

(b) Write notes on : 5+5=10

(i) Ion-exchange chromatography

(ii) HPLC

UNIT—V

9. Answer any *two* of the following questions :

2×2=4

(a) What is electrophoresis?

(b) Define isoelectric focusing.

(c) Write about pulse-field gel electrophoresis.

10. Answer any *one* of the following questions : 10

(a) Write down the principle and procedure of SDS-PAGE. Add a note on immunoelectrophoresis. 6+4=10

(b) Write notes on : 5+5=10

(i) Agarose gel electrophoresis

(ii) Native PAGE

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