

Total No. of printed pages = 5

63/2 (SEM-3) BIT 303

2022

(Held in 2023)

BIOTECHNOLOGY

(Theory Paper)

Paper Code : BIT-303

(Analytical Techniques)

Full Marks - 80

Pass Mark - 32

Time - Three hours

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

1. Choose the correct answers from the following :

1×6=6

(a) Of the following which chromatography technique involves the separation of substances in a mixture over a 0.2 mm thick layer of adsorbent ?

(i) HPLC

(ii) Ion exchange

(iii) Thin layer

(iv) Paper

[Turn over

(b) In which of the following ways, absorption is related to transmittance ?

(i) Absorption is the logarithm of transmittance

(ii) Absorption is the reciprocal of transmittance

(iii) Absorption is the negative logarithm of transmittance

(iv) Absorption is the multiple of transmittance

(c) Which of the following are highly effective in producing ion pairs when they pass through the matter ?

(i) Alpha particles (ii) Beta particles

(iii) Gamma particles (iv) X-ray particles

(d) NMR spectroscopy is used for determining structure in which of the following materials ?

(i) Radioactive materials

(ii) Insoluble chemical compounds

(iii) Liquids

(iv) Gases

(e) Mass spectrometer separates ions on the basis of which of the following ?

(i) Mass

(ii) Charge

(iii) Molecular weight

(iv) Mass to charge ratio

(f) pH meters can be considered as voltage sources with which of the following internal resistances ?

(i) Very low resistance

(ii) Moderate resistance

(iii) Very high resistance

(iv) No resistance.

2. Answer the following questions briefly : $2 \times 5 = 10$

(a) What is Resolving Power of a Microscope ?

(b) What do you mean by R_f value in Chromatography ? How it is calculated ?

(c) What are high speed centrifuges used for ? Name two different types of rotors used in high speed centrifugation.

(d) Define RCF ?

(e) How radioactivity is measured in biological samples ?

3. Write short notes of any six of the following :

(a) Light Microscope $5 \times 6 = 30$

(b) Agarose Gel Electrophoresis

(c) Principles of Primer Designing

(d) Ion Exchange Chromatography

(e) Hydrophobic Chromatography

(f) MALDI-ToF

(g) ELISA

(h) Liquid Scintillation Counter

(i) Sanger Sequencing Method.

4. Answer any two from the following : $10 \times 2 = 20$

(a) What is NMR ? State the principle of NMR. How does the phenomenon of NMR help in Biological Studies ? $2 + 2 + 6 = 10$

(b) What is Cell Immobilization ? Give an overview of cell immobilization techniques. $2 + 8 = 10$

23/63/2 (SEM-3) BIT 303

(4)

80

(c) What is Autoradiography ? What is its principle ? Write notes on applications of Autoradiography.

5. Write the working principles and applications of any one of the following : $14 \times 1 = 14$

(a) Thermal Cycler

(b) Scanning Electron Microscope.

23/63/2 (SEM-3) BIT 303

(5)

80