V
(20516) Roll No. 0938502692

B. Sc.(Biotech.)-I Year

NS-3460

B. Sc. (Biotech.)Examination, May 2016

Instrumentation and Bioanalytical Techniques

(B-106)

(New)

Time : Three Hours] *[Maximum Marks : 50*

Note : Answer any *Five* questions. Each question carries 10 marks.

1. Write short notes on any two of the following : 5×2=10

   (a) Beer and Lambert's law

   (b) Autoradiography

   (c) Differential centrifugation.

2. Describe the different parts of electron microscope. What is the difference between electron microscope and optical microscope ? 10

3. Describe the procedure and application of ion-exchange chromatography. 10

4. Comment on any two of the following : 5×2=10

(a) Phase contrast microscope

(b) Techniques for detection and measurement of radioactivity

(c) Gel exclusion chromatography.

5. Describe the working and application of UV-visible spectrophotometer. 10

6. What do you mean by electrophoresis ? Describe in detail the basic principle and procedure of SDS-PAGE. 10

7. Describe in brief any two of the following : 5×2=10

(a) Principle and working of colorimeter

(b) Importance of radioisotopes in biological studies

(c) Immunoelectrophoresis techniques.

8. What do you understand by MALDI-TOF ? Write its application in Biological Science. 10

9. Enlist the basic components of centrifuge. Discuss its various types in detail. 10

10. Write short notes on any two of the following : 5×2=10

(a) pH meter

(b) NMR spectrometer

(c) X-ray crystallography.

6. Discuss various interactions, selectivity and stationary phases used in capillary columns used in gas chromatography. 10

7. Differentiate between preparative and analytical centrifugation and thereby explain the construction and working of an analytical ultracentrifuge. 10

8. Classify various membrane separation techniques and discuss the mechanisms involved in filtration mechanisms. 10

9. State the importance of radioisotope tracer techniques in biological studies and explain the factors which determine radioactivity? 10

10. Give the name of a chromatographic technique wherein immobilization technique is use to separate a mixture of compounds? 10

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B.Sc. Bio-Tech.-I Year

NS-3460

B.Sc. Bio-Technology Examination, May 2017

Instrumentation and Bio-Analytical Techniques

B-106

(New)

Time : Three Hours] *[Maximum Marks : 50*

Note : Attempt any **five** questions. Q. **No.1** is **compulsory.**

1. Multiple choice questions (only one cross for correct answer). 1×10=10

   (i) In isoelectric focusing, proteins are separated on the basis of their

   (a) relative content of positively charged residue only

   (b) relative content of negatively charged residue only

(c) size

(d) relative content of positively and negatively charged residue

(ii) In a gel filtration column

(a) smaller proteins enter the beads more readily

(b) large proteins elute first

(c) both (a) and (b)

(d) large proteins enter the beads more readily

(iii) In a native PAGE, proteins are separated on the basis of

(a) net negative charge

(b) net charge and size

(c) net positive charges size

(d) net positive charge

(iv) In SDS-PAGE, the protein sample is first

(a) treated with a reducing agent and then with anionic detergent followed by fractionation by electrophoresis.

(b) fractionated by electrophoresis then treated with an oxidizing

3. Write short notes on : 5×2=10

(a) NMR

(b) Gel filtration chromatography

(c) Density gradient centrifugation

(d) Immunoelectrophoresis

(e) Manometry

4. Explain the following with reasoning: 2.5×4=10

(a) Why the pH of stacking gel buffer is kept almost 2 units lower than separating gels?

(b) Why glycerol/sucrose is added in sample papers?

(c) Which component in protein extraction buffer ensures long storage of proteins and how?

(d) State any other method used for visualization of protein samples in SDS PAGE apart from staining with CBB R250?

5. Describe principle of : 5×2=10

(a) What is the basic principle and instrumentation of pH meter?

(b) What is the principle and law of UV, visible and IR spectrophotometry?

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B. Sc. (Biotech.)-I Year

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Instrumentation and Bioanalytical Techniques

(B-106)

(New)

Time : Three Hours] *[Maximum Marks : 50*

Note : Answer any *Five* questions. Each question carries 10 marks.

1. Write short notes on any two of the following : 5×2=10

   (a) Fluorescent microscopy

   (b) Scanning electron microscopy

   (c) Affinity chromatography.

2. Discuss the principle, instrument and applications of Gas Liquid Chromatography (GLC). 10

3. Define Radioactivity. How can you classify radioactivity into different types and measure the amount of radioactivity in biological samples ? 10

4. Comment on any two of the following : 5×2=10
   (a) Density gradient centrifugation
   (b) Luminometry
   (c) Application of mass spectrophotometry.

5. What do you understand by "Autoradiography"? Discuss its principles, design and applications of the autoradiography. 10

6. Describe in brief any two of the following : 5×2=10
   (a) Capillary electrophoresis
   (b) Primers
   (c) X-ray crystallography.

7. Describe the principle and function of UV visible spectrophotometer. 10

8. Write short notes on the following : 5×2=10
   (a) Ion-exchange chromatography
   (b) Immuno-electrophoresis.

9. Discuss the principle, instrument and applications of Gas Liquid Chromatography (GLC). 10

10. Write short notes on the following : 5×2=10
    (a) Radioisotope tracer technique
    (b) Polarography.