Exam. Code : 107406
Subject Code : 2275

B.Sc. (Bio-Technology) 6th Semester

BIOPHYSICAL & BIOCHEMICAL TECHNIQUES-B

Paper—BT-6

Time Allowed—Three Hours] [Maximum Marks—40

Section A is compulsory

Section A :— Attempt ***all*** questions. Each question carried ***one (1)*** mark.

1. What are the main criteria for selection of matrix for MALDI ?
2. List salient features of fluors used in fluorescence spectroscopy ? Give two examples and their applications.
3. What is meant by electro-endosmosis and how it affects the separation of components during electrophoresis ?
4. List different solubilizers used in PAGE and mention about their significance.
5. What does an electropherogram depicts ?
6. Comment on nature of ampholytes and their role in electrophoresis.
7. What is meant by half life in radioactive decay ? Explain with suitable examples.
8. What is meant by scintillation and how it is important in radioactivity studies ?

Section B :— Attempt ***five*** questions. Each question carried ***four (4)*** marks.

1. List differences between linear and reflectron mode TOF analyzers ? Which one is more efficient and why ?
2. What are the differences instrumental set up for visible spectrophotometer and spectrofluorometer ?
3. What are the different solubilizers used in electrophoresis ? Briefly discuss about their mechanism of action and give a suitable example ?
4. Briefly discuss about the principle and working of immuno-electrophoresis. What are the salient applications of this technique ?
5. What is the working principle of capillary electrophoresis ? How it achieves separation of components ? Give a suitable example of application of this technique.
6. How isoelectric point of a protein can be calculated for its efficient separation by IEF ?
7. What are proportional counters and why they are preferred over other instruments for detecting radioactivity ?
8. How radioactivity of labelled biological molecules could be detected in aqueous phase ?

Section C :—Attempt ***two*** questions. Each question carried ***six (6)*** marks.

1. (a) Explain in detail the components and working principle of generating ions of peptides by MALDI. How these fragments could be analysed for determining the amino acid sequence of the sample ?

   (b) Briefly explain the quantitative applications of mass spectrometry with a suitable example.

2. (a) What do you understand by discontinuous gel electrophoresis ?

   (b) What are the components used for preparing the polyacrylamide gel ? Describe in detail the process of gel formation ?

3. Explain in detail the working of 2 D electrophoresis. What is the contribution of this technique in improved separation of biomolecules ?

4. What are the different methods for quantifying radioactivity in solid and liquid samples ? Briefly explain the most suitable methods used for each along with suitable examples.