Class – B.Sc. (BT)-VI (Sem)

Subject – Biophysical and Biochemical Techniques

Paper – BT - 6

Time Allowed : 3 Hours **Maximum Marks : 40**

Section - A

(Compulsory) **(1 × 8)**

Q 1 Attempt all questions. Each question carries 1 mark.

(i) What is quenching and how it affects the efficiency of spectrofluorometry?

(ii) What are the silent differences between MALDI TOF and MALDI Q ?

(iii) What is the main difference between Native PAGE and SDS- PAGE ?

(iv) What is the effect of pH of the buffer on the overall efficiency of electrophoretic separation of proteins?

(v) What is electro-osmotic flow? Comment on its significance.

(vi) Comment on the significance of isoionic pH in separation techniques.

(vii) What is isotope? Give two examples.

(viii) What is the reason for radioactivity?

Section - B

Attempt five questions. Each question carries 4 marks.

(i) How multiply charged can be produced for mass

spectrometric analysis of biological molecules of high molecular weights?

(ii) What is ESI technique? Why its ionisation technique is preferred over other ionisation methods?

(iii) Briefly discuss the factors affecting the electrophoretic mobility of molecules.

(iv) Briefly discuss about the principle and working of pulsed field gel electrophoresis. What are the salient applications of this technique?

(v) What are ampholytes and what are its salient features?

(vi) What is meant by 2 - D electrophoresis? Explain briefly.

(vii) What are the different events possible in decay of radioactive compound?

(viii) How radioactivity of fissile isotopes interact with biological material? List different types of damages attributed to exposure to radioactivity and how they could be avoided.

Section - C (6 × 2)

Attempt 2 questions. Each carries 6 marks.

(i) (a) What is significance of florescence spectroscopy in analysis of biological molecules? Cite relevant example. 3

(b) Explain the principle and working components of fluorescence spectroscopy. 3

(ii) (a) How the gels of different strenghts for PAGE are prepared? 3

(b) What are the salient differences between stacking gel and resolving gel? How they help in efficient separation of proteins in PAGE ? 3

(3) What is the principle of capillary electrophoresis? Briefly describe its working set up and explain how it is different from other electrophoretic techniques and why its separation efficiency is even more than HPLC. (2 + 4)

(4) What is meant by liquid scintillation counting? Discuss in detail the working components of liquid scintillation counting and mention the factors affecting the overall efficiency of the process, citing a relevant example. 6

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