# 2111E740

Candidate's Seat No :_____

**M.Sc Sem-3 Examination**

**502**

**Biochemistry**

**Time : 2-30 Hours]** **November-2024** **[Max. Marks : 70**

**Instructions:**

All questions are compulsory.

Illustrate your answers with neat diagrams wherevernecessary.

**Question - 1** **Write the following :**

i) State the principle and working of flamephotometer. **[07]**

ii) Write a short note on concept of pH and pH scale. **[07]**

***OR***

i) Explain dissociation of acidic amino acid with titration curve **[07]**

ii) Write a short note on Buffer and buffering system with an example **[07]**

**Question - 2** **Write the following :**

i) Write short note on theory and principles of centrifugation. **[07]**

ii) Explain principles and application of paper chromatography. **[07]**

***OR***

i) Explain principles and application of ion exchange chromatography **[07]**

ii) Write short note on differential centrifugation **[07]**

**Question - 3** **Write the following :**

i) Write short note on agarose gel electrophoresis **[07]**

ii) Write short note on immunoelectrofocusing **[07]**

***OR***

i) Write short note on PCR **[07]**

ii) Write short note on Flow cytometry. **[07]**

**Question - 4** **Write the following :**

i) Discuss the principle and step-by-step process of a typical radioimmunoassay. Explain how the competition between radiolabelled and un-labelled antigens for antibody binding sites leads to quantification of the target molecule. Include the significance of using a standard curve in RIA. **[07]**

ii) Explain the process of autoradiography in detecting and visualizing radioactive molecules in biological samples. Discuss the preparation of samples, exposure to radiation, development of autoradiograms, and the factors affecting the sensitivity and resolution of the images, such as exposure time and the type of radioactive isotope used. **[07]**

***OR***

i) Explain different types of radioactive isotopes with two examples each example? **[07]**

ii) What is radioactivity explain with at least two detailed examples? **[07]**



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**Question - 5** **Attempt any *seven* out of twelve :** **[14]**

i) What is the principle of liquid scintillation counting, and how does it detect radioactive emissions?

ii) Why are ultracentrifuges used?

iii) Explain the importance of affinity and specificity in the antibodies used in RIA. How do these properties affect the sensitivity of the assay?

iv) Compare the resolution of autoradiography with that of other imaging techniques like fluorescence microscopy. What factors influence the resolution in autoradiographic studies?

v) What is partition coefficient?

vi) What is the function of the monochromator?

vii) What are scintillation cocktails, and why are they used in liquid scintillation counting?

viii) What is the half life of $^{125}I$ and $^{131}I$ and what type of radiation they emit?

ix) What is the role of radio labelled antigens in a competitive RIA?

x) What is the half life of $^{125}I$ and $^{131}I$ and what type of radiation they emit?

xi) What is the half life of $^{125}I$ and $^{131}I$ and what type of radiation they emit?

xii) What is autoradiography, and how is it used to detect radioactive molecules in biological samples?