1411E1185

Candidate's Seat No : _____

M.Sc. Sem.-3 Examination

502

Toxicology

November-2025

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

Q1A	Write a note on AAS and its advantages in toxicology.	7 Marks
Q1B	What is the full form of FTIR? What its principle and advantages?	7 Marks
	OR	
Q1A	What is the procedure of AAS and what are the disadvantage of this method?	7 Marks
Q1B	Write a brief note on MS and its types.	7 Marks
Q2A	Write a brief note on parts of HPLC and its role.	7 Marks
Q2B	Explain capillary electrophoresis and its importance.	7 Marks
	OR	
Q2A	Explain separation in HPLC and its application in detail.	7 Marks
Q2B	Write a note on role of capillary electrophoresis in sanger sequencing and its advantages.	7 Marks
Q3A	Explain the fundamental working principle of a Scanning Electron Microscope (SEM), detailing the interaction between the electron beam and the specimen that generates the various signals.	7 Marks
Q3B	Identify and briefly describe the function of four main components of the SEM instrument, such as the electron gun, electromagnetic lenses, scanning coils, and detectors.	7 Marks
	OR	
Q3A	Describe the working principle of a Transmission Electron Microscope (TEM), emphasizing why it achieves a much higher resolution than a conventional light microscope.	7 Marks
Q3B	Compare and contrast the Scanning Electron Microscope (SEM) and the Transmission Electron Microscope (TEM).	7 Marks
Q4A	Explain the principle of CT-scan. What is the unit of CT scan image?	7 Marks
Q4B	What is MRI? What is its principle?	7 Marks
	OR	
Q4A	Explain the advantages of CT-scan of small animals in toxicological perspective.	7 Marks
Q4B	What are the advantages of MRI?	7 Marks
Q5	Answer the following questions (Any Seven)	**14 Marks**

P.T.O

E1185-2

I	How ICP-MS is better than AAS?	2 Marks
II	Write two disadvantages of FTIR.	2 Marks
III	What is m/z ratio in MS?	2 Marks
IV	What is the role of degasser?	2 Marks
V	What is the difference between isocratic and gradient run of HPLC?	2 Marks
VI	What is the advantage of chip-based electrophoresis of protein?	2 Marks
VII	The detector pinhole is an essential optical component whose primary function is to block _____ light from reaching the detector, which is critical for optical sectioning.	2 Marks
VII	What is the single-word name for the component that provides a highly intense, coherent, and monochromatic beam of light for exciting fluorophores in a Confocal Microscopy?	2 Marks
IX	What is the term for the specialized instrument used to cut TEM samples into the necessary ultrathin sections (typically 50–100 nm)? Why ultrathin samples are required?	2 Marks
X	How does Black, Gray and White colour are observed in CT scan based on cell density?	2 Marks
XI	Out of MRI and CT scan, which technique does not use ionizing radiation?	2 Marks
XII	What is resonance?	2 Marks

BEST OF LUCK