Exam.Code:0911
Sub. Code: 33386

2125

B.E. (Bio-Technology) Seventh Semester

BIO-714: Bio-Analytical Techniques

Time allowed: 3 Hours Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.

x-x-x

1. Answer the following briefly: -
   a) Which gas is used in Geiger Muller counter?
   b) Define limit of resolution in a microscope.
   c) How is reverse phase HPLC different from normal phase HPLC?
   d) Which radioisotope is used in diagnosis of thyroid disorders?
   e) What is gold sputtering?
   f) Name a microscope which does not have a lens.
   g) Differentiate between Spectrophotometry and Spectrofluorimetry.
   h) The grid in electron microscope is made up of_____.
   i) What is cryo-utramicrotome?
   j) Give one application of atomic absorption spectroscopy. (10x1)

UNIT - I

2. a) Diagrammatically, provide an overview of the IR spectra of different class of compounds.
   b) What are the different factors the affect the position, number and strength of a signal in NMR? Discuss using a suitable example. (2x5)

3. a) Differentiate between single beam and double beam spectrophotometer and discuss the factors that influence the absorption spectra of a compound.
   b) Give a schematic of longitudinal and transverse magnetization on applying and removing radiofrequency waves in MRI. (2x5)

P.T.O.

4. a) You are an analytical chemist and have been given the responsibility to check the purity of a drug that is synthesized in the laboratory. Describe any one analytical technique you may use to check the concentration of various components in that drug and discuss its working.

   b) Elaborate on the principle of spectrofluorimetry and discuss various details related to its instrumentation. (2x5)

UNIT - II

5. a) Discuss the differences in the working of STM and AFM. Why is AFM considered better for biological samples?

   b) Discuss the working of any two detectors in Gas Chromatography. (2x5)

6. a) Name the Law of diffraction which is the base if XRD and explain its significance in crystal structure determination?

   b) Describe its working principle using a diagram of an electron microscope. What precautions should be taken while preparing samples for electron microscopy?(2x5)

7. a) Ionization of the sample is necessary for Mass-spectroscopy. Name and discuss any five types of ionization methods that used for such analysis. Use diagrams if necessary.

   b) Highlight the application of radioisotopes in biological science and the safety measures that should be taken in handling isotopes. (2x5)

x-x-x