Code No: 07A42302 **R07** **Set No. 2**

II B.Tech II Semester Examinations,December 2010
INSTRUMENTAL METHODS OF ANALYSIS
Bio-Technology

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Write short notes on:
   (a) Centrifugal elution
   (b) Continuous centrifuges
   (c) High speed refrigerated centrifuges
   (d) Small bench centrifuges. [4*4=16]
2. What is light microscope? Explain the basic components in light microscope and their applications. [16]
3. Write notes on:
   (a) Problem in analysis
   (b) Methods in analysis
   (c) Comparison with standards
   (d) Qualitative analysis. [4*4=16]
4. What are macromolecules? Explain the role of NMR in ananlysis of macromolecules? [16]
5. Explain in detail about the Affinity Ligands and Elution Methods in Affinity Chromatography. [16]
6. Explain the Diffraction phenomena with the aid of the reciprocal lattice concept. [16]
7. Explain in detail about the quantitative analysis of mixtures using Mass Spectrometer. [16]
8. The metabolite M was isolated from CSF. After excitation at $\lambda_1 = 280$ nm the material fluoresced at $\lambda_2 = 360$ nm.

   Using standard spectrofluorimeter
   The instrument scale was set to zero with solvent (buffer) and the 100% mark using a pure sample of M as standard (conc. 100ng/100 cm^{-3}) A balnk was measured on a solution containing all the components expect M and gave readings of 11.2%
   An extract including M gave total florescence measurements of 67%.
   The overall fluorescence reading 92% was observed when the extract above had an

amount of pure M added, as internal standard, to give an equivalent conc. of 1μg dm^{-3}. (Note this conc. is equivalent to 100 ng 100 cm^{-3}.)

Calculate the concentration of M in the sample of CSF in μg dm^{-3} and the proportion of quenching, if any. Also state the stokes shift for the assay). [16]

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Code No: 07A42302 **R07** **Set No. 4**

II B.Tech II Semester Examinations,December 2010
INSTRUMENTAL METHODS OF ANALYSIS
Bio-Technology

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) With a neat sketch explain principle, working method and application of visible spectrometry.
   (b) Explain application of colourimetry. [8+8]
2. Give in detail about the Biological ESR Principles and its applications. [16]
3. What is Ultra filtration? Explain in detail with principle and its advantages and applications with suitable examples. [16]
4. Explain how does resolution depends upon the wave length of light, refractive index and the numerical aperture? What are the functions of immersion oil and substrate condenser? [16]
5. Explain in detail about the principle and operating procedure of NMR spectroscopy? [16]
6. Give an account of the instruments involved in electrochemical methods of analysis along with their principle of working. [16]
7. You wish to sediment a preparation of equine encephalitis virus (s_{20},w=300) of the two fixed angle rotors that are available, rotor A has r_{min}=4 cm, r_{max}=11.2 cm, and a maximum speed of 35000 rev min^{-1}. Rotor B has r_{min} =4.2 cm and a maximum speed of 65000 rev min^{-1}.
   (a) Calculate the k factor for each rotor and then estimate the time required to pellet the virus preparation using each rotor, assuming that the rotors are operated at their maximum speed and that centrifuges tubes are full.
   (b) Which rotor is most efficient for sedimenting the virus preparation? Give the reason for your answer. [16]
8. Explain in detail about the Unique method of sampling liquid streams used for the measurement of dissolved oxygen using dissolved oxygen electrode with neat diagram. [16]

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Code No: 07A42302 **R07** **Set No. 1**

II B.Tech II Semester Examinations,December 2010
INSTRUMENTAL METHODS OF ANALYSIS
Bio-Technology

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Explain the different types of Sensors used in the online monitoring and explain any one. [16]
2. Define the following:
   (a) Fixation
   (b) Dye
   (c) Chromophore
   (d) Basic dye
   (e) Acid fast staining
   (f) Differential staining
   (g) Basic dye
   (h) Acid dye. [2*8=16]
3. What is HPLC? Explain in detail with principle and its advantages and applications with suitable examples. [16]
4. (a) Discuss in detail about errors in mass spectroscopy.
   (b) List out the methods of expressing the accuracy in NMR spectroscopy. [8+8]
5. Explain the significance sedimentation co-efficient in centrifugation. [16]
6. Explain in detail about the Quantitative Analysis of a Infra Red Spectrum with the help of Near - Infrared Region. [16]
7. Explain the significant features of Double Resonance in Nuclear magnetic Resonance Spectroscopy. [16]
8. The concentrations of two components X1 and X2 may also be found if they both absorb at two wave lengths, provided the standards parameters are known. Measurements were made in an 0.01 m cuvette at wavelengths of 340nm and 380 nm. The total absorbance values obtained at each wavelength were 0.42 and 0.284, respectively. The absorptivities of X1 and X2 are 1.6 * 10^7 and 8.2*10^6 mol^{-1} m^2, respectively at 340 nm and 3.65*10^6 and 6.2*10^6 mol^{-1} m^2, respectively at 380 nm. Find the concentrations of X1 and X2. [16]

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Code No: 07A42302 **R07** **Set No. 3**

II B.Tech II Semester Examinations,December 2010
INSTRUMENTAL METHODS OF ANALYSIS
Bio-Technology

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Give various types of Ionization Methods in Mass spectrometry.
   (b) Discuss in detail about any one Ionization Method. [6+10]
2. What is Ion Exchange Chromatography? Explain in detail with principle and its advantages and applications with suitable examples. [16]
3. Explain about the nature of gradient materials and their uses. [16]
4. Define mono chromators? Explain the performance of mono chrmotors in details. [16]
5. Write in detail about phase contrast microscopy. [16]
6. What is dissolved Oxygen? Give the Physical methods and chemical methods to analyze the dissolved oxygen. [16]
7. How do you the quantitative analysis and explain in detail with suitable example. [16]
8. Explain how the hardware signal enhancement techniques offer over other hardware devices:
   (a) Active filters
   (b) Boxcar integrators. [16]

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