(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2129 Roll No. | | | | | | | | | | |

B.Tech.

(SEMESTER-V) THEORY EXAMINATION, 2012-13

MODERN ANALYTICAL TECHNIQUES

Time : 3 Hours] *[Total Marks : 100*

Section – A

1. Attempt **all** parts : **10 × 2 = 20**

(a) Define the term quality audit.

(b) What is meant by redox couple ?

(c) Define Autoradiography.

(d) State Beer's law.

(e) What are zwitter ions ? What is their significance ?

(f) Mention the radiation source for UV and Visible regions.

(g) What is meant by density gradient centrifugation ?

(h) Define RF value.

(i) Name any 2 cellulose based ion exchangers.

(j) What is the principle of electrochemical sensor ?

Section – B

2. Attempt any **three** parts : **10 × 3 = 30**

(a) Write short notes on :

(i) Dispersive components of Infrared Spectrometer

(ii) Shedding and De shedding effects in NMR

(b) Write a short note on MALDI-MS.

(c) Define SOPs. Discuss the guidelines for preparing SOP and give blank format for SOP.

(d) Explain the principle and working of HPLC.

(e) Write a short note on equilibrium dialysis.

Section – C

Attempt **all** questions : **10 × 5 = 50**

3. Attempt any **two** parts : **5 × 2 = 10**

   (a) Write a short note on photomultiplier tubes.

   (b) Write a short note on chemical shift reagent.

   (c) What are the storage methods for hazardous chemicals used in the laboratory.

4. Attempt any **one** part : **10 × 1 = 10**

   (a) Discuss the theory of UV spectroscopy. Explain in detail about the instrumentation of double beam UV spectrophotometer.

   (b) How will you analyse the following compounds on the basis of NMR spectroscopy :

   (1) CH_3CH_2Br

   (2) $CH_3CHClCH_3$

   (3) $CH_3OCH_2CH_3$

   (4) CH_3CHO

5. Attempt any **one** part : **10 × 1 = 10**

   (a) With a neat sketch explain the working of different types of rotors used in a centrifuge.

   (b) Describe the principle and working of analytical centrifuges. Add a note on its application.

6. Attempt any **one** part : **10 × 1 = 10**

   (a) Explain the principle and working of ion exchange chromatography.

   (b) Explain the principal components and application of pulse field electrophoresis.

7. Attempt any **two** parts. **5 × 2 = 10**

   (a) Explain the construction of oxygen electrodes.

   (b) Discuss the theory of crystallization.

   (c) Discuss the philosophy of good manufacturing as per WHO and GMP.