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

PAPER ID : 2442 Roll No. | | | | | | | | | | |

B.Tech.

(SEMESTER-VI) THEORY EXAMINATION, 2012-13

BIOPHYSICS

Time : 2 Hours] *[Total Marks : 50*

SECTION – A

1. Attempt **all** question parts : **10 × 1 = 10**

(a) Explain sedimentation coefficient and centrifugal force.

(b) What is Isoelectric point and function in protein separation?

(c) Mention the limitations of atomic force microscopy.

(d) What are the different sources of X-rays and how it is produced ?

(e) How and what are the parameters used to measure viscosity of fluids?

(f) What are the various components of a diffractometer ?

(g) How do cationic exchange resins differ from anionic resins?

(h) Explain Bragg's law.

(i) Write short note on fluorophores with an example.

(j) What is refractive index and its significance?

SECTION – B

2. Attempt any **three** question parts : **3 × 5 = 15**

(a) Explain the instruments involved in the NMR spectrometer with diagram.

(b) What are the common dissolved ions in drinking water ?

(c) What are the different types of Affinity chromatography ?

(d) Explain briefly about the sensitivity and detection limits.

(e) Illustrate the methodology used to determine the protein structure with the help of schematic diagram.

SECTION – C

Attempt **all** questions : $5 \times 5 = 25$

3. Attempt any **one** part : $1 \times 5 = 5$

   (a) Differentiate between SEM and TEM.

   (b) Explain in detail about the various techniques used to study protein structure.

4. Attempt any **one** part : $1 \times 5 = 5$

   (a) Discuss in detail about the working principle of analytical centrifugation.

   (b) Explain the procedure involved in the SDS-PAGE electrophoresis.

5. Attempt any **one** part : $1 \times 5 = 5$

   (a) Discuss in detail the errors occurring in pH meters.

   (b) Explain the instrumentation of ESR with block diagram.

6. Attempt any **one** part : $1 \times 5 = 5$

   (a) Explain in detail about the sample preparation techniques for IR spectroscopy.

   (b) Discuss about the different types of chromatographic techniques with simple diagram.

7. Attempt any **one** part : $1 \times 5 = 5$

   (a) How to separate and visualize recombinant DNA from normal DNA ?

   (b) Explain the relationship between surface tension and temperature of liquids.