Printed Pages : 2

BT-302

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

PAPER ID : 154302

Roll No.

B. Tech.

(SEM. III) (ODD SEM.) THEORY EXAMINATION, 2014-15

INSTRUMENTATION AND TECHNIQUES

Time : 3 Hours] [Total Marks : 100

Note : 1) Attempt all questions.
2) All questions carry equal marks.

1 Attempt any **four** parts of the following : **5×4=20**

a) Differentiate between SEM and TEM.

b) What is Flow Cytometry ? Write applications of flow cytometry.

c) Write a short note on Bright Field Microscopy with suitable diagram.

d) Write down the working principle of confocal microscopy.

e) Write a short note on Dark Field Microscopy with suitable diagram.

2 Attempt any **two** parts of the following : **10×2=20**

a) What is affinity chromatography ? Discuss the principle and its role in rapid purification of biomolecules.

b) Explain the principle and working of ion exchange chromatography.

c) Write a short note on :
   i) Reverse osmosis
   ii) Ultrafiltration.

3 Attempt any **two** parts of the following. **10×2=20**

a) Discuss the application of electrofocusing followed by SDS-PAGE in protein separation.

b) What is electrophoresis ? Describe the principle of separation of proteins through polyacrylamide gel electrophoresis.

c) Define the term Blotting. Giving suitable diagram describe the process of Western Blotting.

4 Write short note on any **four** : **5×4=20**

a) IR spectroscopy and its functioning

b) Application of NMR in biotechnology

c) UV-VIS spectrophotometer and molar extinction coefficient

d) Beer-Lamberts law

e) X-Ray Diffraction analysis and their application in biotechnology.

5 Attempt any **two** parts of the following : **10×2=20**

a) What are the advantages of using swing bucket rotor ? Describe mentioning the principle of centrifugation.

b) What is the difference between density gradient and differential centrifugation ? Briefly describe with the help of suitable example.

c) Explain basic theory of centrifugation. Enumerate different types of centrifuge used.
