

IGNOU

TERM END EXAMINATION, JUNE 2014

PHD LIFE SCIENCES

Biological Techniques (RLS-002)

Duration 3 Hours

MM:100

Answer any five questions from question nos: 1 to 8. All Questions carry equal marks. Draw well labeled diagram, wherever necessary to support your answer.

1. What is the basic principle of centrifugation? How does density gradient centrifugation differ from differential centrifugation? Discuss the various applications of analytical ultracentrifugation. Calculate the applied centrifugal field and the rotor speed (s) at a point equivalent to 5 cm from the centre of rotation at an angular velocity ($\omega = \frac{2\pi n}{60}$) of 4000 rad s⁻¹? 20
2. Differentiate between the following pairs: 2x10=20
 - i. SDS-PAGE of proteins and agarose gel electrophoresis of DNA
 - ii. Polymerase chain reaction (PCR) and real time PCR
3. Explain the Beer- Lambert law. How is this law used by biologists in quantitative analyses of biological samples? 20
4. What is ELISA used for? What is the principle of ELISA? Explain how competitive ELISA is different from ELISPOT assay. 20
5. What are different the kinds of studies that can be done by electron microscopy? Explain the working of an electron microscope. Differentiate between the working and function of Transmission Electron Microscope and Scanning Electron Microscope. 20
6. Describe the various components of a typical column chromatographic system in which a gas or liquid mobile phase is used. Differentiate between ion exchange chromatography and affinity chromatography on the basis of their principle and applications. 20
7. What kinds of studies are done by DNA sequencing? Describe the method of DNA sequencing. 20
8. Explain the characteristics of a good bacterial culture medium. Define selective media with the help of examples. Explain how they differ from differential media. 20