

2072

B.E. (Biotechnology) Second Semester

ESBT-202: Fundamentals of Bio-Technology and Bio-Engineering

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I. Attempt the following:-

- a. Define mole concept.
- b. Mention any two applications of biochips.
- c. You have a stock solution of a dye (10 mg/ml), you took 2 ml from this and added in tube A which already had 8 ml water. What will be the concentration of dye in tube A?
- d. How does a pH meter work?
- e. Differentiate between RPM and RCF.
- f. How can you protect yourself while working with radionuclides?
- g. S.I is an acronym for _____.
- h. What information can be obtained from a brain MRI?
- i. _____ is the S.I unit of temperature.
- j. Mention one use of NCBI.

(10x1)

UNIT - I

- II.
 - a) Differentiate between size exclusion and ion exchange chromatography.
 - b) Explain different systems of Units. Why it is important to have consistent units world over? (2x5)
- III.
 - a) Draw a labeled diagram of an autoclave. Why is the process of autoclaving more efficient than using hot water?
 - b) Discuss the principle of spectrophotometer and differentiate between single beam and double beam spectrophotometer. (2x5)

P.T.O.

(2)

- IV. a) Name the different types of microscopes. Describe two key features about each type.
b) Define radionuclides. Elaborate on their types and biomedical applications. (2x5)

UNIT - II

- V. a) What is a biosensor? Explain different components of biosensors using a diagram.
Write a note on any one type of biosensor.
b) Define a database. Write a short note on different databases used for DNA and proteins. (2x5)
- VI. a) Explain Einthoven's triangle using a diagram. What types of waves you get in ECG.
b) Which technique is used to measure electrical activity of brain? Discuss the working in detail. (2x5)
- VII. a) Explain the reason why systems show different properties at nanoscale and enlist any four applications of nanobiotechnology in human medicine.
b) Discuss the components and working of an ultrasound in detail. (2x5)

x-x-x