

2063

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) Name any four different types of microscopes.
- b) How many liters of 20% alcohol solution should be added to 40 liters of a 50% alcohol solution to make a 30% solution?
- c) Which isotope determines fossil age?
- d) BLAST is an acronym for \_\_\_\_\_.
- e) What are the 4 components of MRI?
- f) Biochips are made up of \_\_\_\_\_.
- g) A student averaged 45 miles per hour on a trip. What was the student's speed in feet per second?
- h) Nanomaterials are defined as powders having an average particle size of less than \_\_\_\_\_ nm.
- i) Name the technique that separates charged particles using electric field.
- j) Mention the main function of a bioreactor. (10x1)

**UNIT - I**

- II. a) Name the different components of a spectrophotometer and mention their function.  
b) Draw a labeled diagram explaining the working principle of pH meter. (2x5)
- III. a) Why is an autoclave more efficient in sterilization as compared to boiling water?  
Elaborate on the precautions to be taken while using an autoclave.  
b) Define radionuclides and enlist any five biological applications of radionuclides. (2x5)
- IV. a) Discuss the principle of size exclusion chromatography in detail using a labeled diagram.  
b) What is lyophilization? Describe all the steps involved in the process in details.

(2x5)

P.T.O.

(2)

UNIT - II

- V. a) Name the instrument that is used to detect cardiac arrhythmia and describe its functioning.  
b) Differentiate between T1 and T2 relaxation, how does these effect the MRI images? (2x5)
- VI. a) What is a database? Discuss any two types of databases in detail.  
b) Name the three types of biochips. Using a labeled diagram describe the working of any one. (2x5)
- VII. "Nano-biotechnology has revolutionized in the field of biomedical sciences." Justify this statement in light of recent development in the field. (10)

x-x-x