

2023
B.E. (Biotechnology), Second Semester
ESBT-202: Fundamentals of Biotechnology 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 Section.

x-x-x

1. Attempt the following:-

(10x1)

- a. What are some of the common techniques used in separating mixtures?
- b. Which factors affect the electrophoresis mobility?
- c. Mention one function of nanorobots.
- d. Name any two protein databases.
- e. EEG is an acronym for _____.
- f. Define retention time.
- g. Name different types of lyophilizers.
- h. What is the special property of pH meter bulb?
- i. Differentiate between alpha and beta particle.
- j. Mention any two applications of gamma rays.

Section A

- 2(a). What is the difference between a mixture and a solution? Elaborate (5)
- (b) Using a labeled diagram, describe the components of an autoclave. (5)
- 3.(a)How does centrifugation separates mixtures? Discuss the principle in detail. (5)
- (b) Agarose gel electrophoresis is used to separate DNA and PAGE is used to separate proteins. Can we use both these techniques to separate DNA and proteins? Justify you answer with reasons. (5)
4. Differentiate between:
(a) light microscope and an electron microscope
(b) single beam and double beam spectrophotometer (2x5)

(2)

Section B

- 5.(a) "Nanotechnology has revolutionized the field of area of biomedical sciences". In light of this statement discuss the applications of nanotechnology in healthcare. (5)
- (b) Draw a labeled diagram of MRI machine and elaborate on its working. (5)
6. (a) Name different types of bioreactors, discuss design and operations of any one. Use diagram if required. (5)
- (b) Enlist different types of sensors. Draw a labeled diagram of the components of a sensors and discuss any one type of sensor in detail. (5)
- 7(a) Explain Einthoven's triangle using a diagram. What types of waves you get in ECG. (5)
- (b) Discuss the working of a biochip in detail. (5)

x-x-x