Exam.Code:0906
Sub. Code: 33268

2056

B.E., Second Semester

BTBS-201: Fundamentals of Bioengineering

Time allowed: 3 Hours Max. Marks: 50

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

x-x-x

I. Answer the following:-

a) Define colloid.

b) Give an ideal example to explain alpha decay.

c) Why does a denser biological structure settle faster?

d) What is Doppler used for?

e) How should a pH electrode be stored?

f) What is the difference between mixture and solution?

g) Differentiate between primary and secondary drying?

h) What does the QRS complex represent?

i) Name any four methods for sterilization.

j) The SI unit of radioactivity is_____. (10x1)

UNIT - I

II. a) Define dimensional analysis and list the applications and limitations of dimensional analysis.

b) Explain different systems of Units. Why it is important to have consistent units world over? (2x5)

III. Write a short note on:

a) Types and functions of incubator

b) Principles of spectrophotometer

c) Parts of microscope

d) Principle of pH meter (10)

P.T.O.

IV. a) Define chromatography. Which factors affect the separation of components in chromatography? Discuss any one type of chromatography in detail.

b) Elaborate on working principle of electrophoresis. How is it useful in separating DNA and proteins? (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) Explain Einthoven's triangle using a diagram. What types of waves you get in ECG. (2x5)

VI. Write a short note on:

a) applications of EEG

b) instruments-construction of MRI

c) working of an ultrasound

d) biological systems at nanoscale (10)

VII. a) Enlist the applications of nano-biotechnology in medicine and healthcare.

b) Draw a labelled diagram of a bioreactor and discuss its design and operations in detail. (2x5)

x-x-x