Exam.Code:0911
Sub. Code: 6724

1078
B.E. (Biotechnology)
Seventh Semester
BIO-704: Bio Analytical Techniques

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. Make suitable assumptions wherever necessary.*

x-x-x

I. Attempt the following:-

a) Describe the composition of scintillation-cocktail.

b) Explain what is meant by MALDI?

c) What is the basic difference between intrinsic and extrinsic fluorescence?

d) Enlist various causes of deviations from Beer's law.

e) Describe how to determine metallic impurities in food samples.

f) Explain the basis of any one type radioactivity unit.

g) Suggest an experiment to prove whether an unknown molecule has a centre of symmetry.

h) Justify whether quenching is desirable or undesirable for fluorescence measurements.

i) What is a radiotracer?

j) Explain the term chemical shift. (10x1)

UNIT – I

II. a) Explain the essential requisition for the infrared radiation absorption. With the help of a mathematical theory, obtain an expression for the frequency of absorption (v).

b) With the help of quantum theory explain why Stake's lines are far more intense than the anti-Stoke's lines in Raman spectra. (6,4)

III. Describe the following in context to NMR:-

a) Chemical shift
b) Magnetic anisotropy
c) Reasons for TMS as a reference compound
d) Cryostat (4x2½)

P.T.O.

IV. a) Explain the mechanism of hyperfine coupling/interaction in the ESR spectra of organic radicals.

b) Describe the construction and working principle for a hollow cathode lamp in an atomic absorption spectrometer. (5,5)

UNIT – II

V. a) With the help of a neat and labelled sketch describe the principle of Scanning-Tunnelling microscope.

b) Give a brief overview of sample preparation for electron microscope analysis.(5,5)

VI. a) Explain various types of detector systems used in HPLC.

b) Discuss in the working principle of GC-MS. (5,5)

VII. Write Short notes on:-

a) Significance of vacuum in electron microscope.

b) Role of radioactivity in diagnostics and therapeutics. (5,5)

x-x-x