1129
B.Sc. (Hons.) Biotechnology
Fifth Semester
BIOT-Sem-V-II-T: Bio-Analytical Tools

Time allowed: 3 Hours

Max. Marks: 67

NOTE: *Attempt five questions in all, including Question No. IX (Unit –III) which is compulsory and selecting two questions each from Unit I -II.*

x-x-x

UNIT – I

I. a) Give principle of phase contrast microscopy. What is negative and positive phase contrast?

    b) Describe various types of pH meter electrodes along with their diagrams. (7,6)

II. a) Write down the principle and parts of SEM with a well labeled ray diagram. Give its applications.

    b) Discuss the differences between absorption and emission spectra. (7,6)

III. a) Explain the principle of fluorimetry with energy level diagram. Also draw the diagram of mechanism of centrifugation by using swinging bucket rotor.

    b) Describe the principle of differential centrifugation by using a flow chart. (7,6)

IV. a) Describe various types of radiation sources used for IR spectroscopy. Write any two applications of UV/VIS spectroscopy.

    b) Explain all the parts of a monochromator used in UV/Vis spectroscopy with a well labeled diagram. Write a short note on high speed refrigerated centrifuge. (7,6)

UNIT – II

V. a) Discuss the principle and applications of gel filtration chromatography.

    b) Discuss various types of pumps used in HPLC. (7,6)

VI. a) Give principle of gas chromatography. Describe ascending and radial paper chromatography.

    b) Discuss the steps followed in thin layer chromatography. (7,6)

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VII. a) Explain the principle of agarose gel electrophoresis. Write applications of PFGE.

b) Discuss various applications of nanotechnology. (7,6)

VIII. a) Schematically explain western blotting. Give a detailed account of applications of SDS PAGE.

b) Discuss the principle and working of isoelectric focusing. (7,6)

UNIT – III

IX. Briefly explain:-

a) Resolving gel

b) FID detector

c) Chemiluminescence

d) Resolving power

e) Biosensor

f) WCOT column

g) Sephadex

h) Bathochromic shift

i) Rate zonal centrifugation

j) Intersystem crossing (10x1½)

x-x-x