5/4/2023 (morn)

(i) Printed Pages : 4 Roll No. .....

(ii) Questions : 9 Sub. Code : 0160

Exam. Code : 0002

B.A./B.Sc. (General) 2nd Semester

(2053)

BIO-CHEMISTRY

Paper : A Biochemical Techniques

Time Allowed : Three Hours] [Maximum Marks : 45

Note :— Attempt **five** questions in total including Question No. 1, which is compulsory. Attempt **one** question from each of the Unit I to Unit IV.

(Compulsory Question)

I. Answer in 3-4 lines :

(i) What is a monochromator ?

(ii) What is a grating device and its function ?

(iii) What is slit width ?

(iv) What is a cation-exchanger ? Give a suitable example.

(v) What is the function of an Electron Capture Detector (ECD) in GLC ?

(vi) Convert 8,000 rpm to RCF, if average radius of an angular rotor is 10 cm.

(vii) What is isopycnic centrifugation ?

(viii) What is the function of ammonium persulfate in casting a polyacrylamide gel ?

(ix) Which among angular, straight and swing bucket rotor shall take least time to sediment human RBCs ? 1×9=9

UNIT—I

II. (a) What is Beers and Lambert's law ? Describe major limitations of this law in spectroscopy.

(b) What is Infrared spectroscopy ? Describe its principle and important applications in biology.

(c) What is colorimetry ? How concentrations of reducing sugars, protein and DNA can be determined by this technique ? 4,3,2

III. (a) What is UV spectroscopy ? Draw a schematic diagram of a double beam spectrophotometer, label various parts and describe their functions.

(b) What is a fluorimetry ? Describe its principle and applications in spectroscopy.

(c) Which fluorochrome(s) are used for determination of intracellular calcium ions ? 4,4,1

UNIT—II

IV. (a) What is underlying principle of gel permeation chromatography ? Describe this technique in detail.

(b) What is paper chromatography ? Explain its principle and method of analyte detection in detail.

(c) Describe the principle of reverse-phase chromatography in brief. 4,3,2

V. (a) What is affinity chromatography ? Describe its principle and applications in detail. 3

(b) Write short notes on any **two** of the following :

(i) TLC

(ii) Rapid dialysis

(iii) Ion-exchange chromatography. 3×2=6

UNIT—III

VI. (a) What is a RCF ? How it is determined ?

(b) What is a sedimentation coefficient of a particle ? How it is determined ?

(c) What is a swing-bucket rotor ? Describe its major applications in biological sciences. 4,4,1

VII. (a) What is a preparative ultracentrifuge ? Draw its diagram, label various parts and describe their functioning.

(b) What is differential centrifugation ? Describe its important applications. 5,4

UNIT—IV

VIII. (a) What is immunodiffusion ? Describe the technique of Rocket immuno-electrophoresis in brief.

(b) What is SDS-PAGE ? How molecular mass of an unknown protein is determined by this method ? 4,5

IX. Write short notes on any **three** of the following :

(i) DID

(ii) PFGE

(iii) 2D-PAGE

(iv) Native PAGE $3 \times 3 = 9$