

(i) Printed Pages : 3

Roll No. ....

(ii) Questions : 9

Sub. Code :

1	7	3	5	9
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Exam. Code :

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B.A./B.Sc. (General) 4<sup>th</sup> Semester  
(2055)

### BIO-CHEMISTRY

Paper : A—Advanced Bio-Chemical Techniques

Time Allowed : Three Hours]

[Maximum Marks : 45

**Note** :— Attempt *five* questions, including Question No. 1, which is compulsory, and selecting *one* question from each Section. Students are advised to solve questions in an ordered manner and clearly mention their numbers and its subparts as well.

1. Give answers of the following :

- (1) Define osmosis.
- (2) What is cryopreservation ?
- (3) Write the names of two DNA staining dyes used in fluorescence microscopy.
- (4) Give the names of two types of spectrophotometers.
- (5) What is ultracentrifugation ?
- (6) Write the names of two radioimmune assays.
- (7) Extend FISH.
- (8) What is FTIR spectroscopy ?
- (9) Extend the abbreviation TOF-MS.

9×1=9

## SECTION—I

2. Write short notes on :

(1) Animal cell culture

(2) Flow cytometry. 5,4

3. (a) Discuss the applications of plant tissue culture.

(b) Explain the process of ultrafiltration. 4,5

## SECTION—II

4. (a) Write the principles of cell counting. Why is cell counting important in biomedical research ?

(b) What is fluorescence ? Describe the various biological and synthetic fluorescent molecules. 5,4

5. (a) What are the steps involved in the FRET ? Write the applications of the FRET.

(b) What are FISH ? Discuss their application in clinical diagnostics. 4,5

## SECTION—III

6. (a) What is radioactive half-life ? Write the characteristics of different radioactive isotopes used in biological research.

(b) What is a scintillation counter ? Give one example of its application. 5,4

7. (a) Discuss the various precautions and safety measures taken while handling radioactive materials in a laboratory.
- (b) What are radiolabeled compounds ? Why are they important in autoradiography biochemical studies ? 5,4

#### SECTION—IV

8. (a) Write the principle of mass spectrometry and mention its various applications.
- (b) What are the different ionization techniques used in mass spectrometry ? Discuss the application of ESI in LC-MS. 5,4
9. (a) Explain the working of NMR and its significance in molecular structure determination.
- (b) Write the applications of ESR. 4,5