2013
M.Sc.
1st Semester Examination

BIOTECHNOLOGY

PAPER—BIT-101

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Group—A

1. Answer any five questions from the following : 2x5

   (a) Distinguish between nucleotides and nucleosides.

   (b) State the saponification process in triacyl glycerol.

   (c) Define Zwitter ions.

   (d) What is Cot value?

   (e) Define the role of ammonium sulphate [(NH₄)₂SO₄] during protein purification by dialysis method.

(Turn Over)
(f) "Entropy is involved in the maintenance of the membrane polarization of a living cell" — Comment.

(g) Can enzyme change the equilibrium constant (KCl) and free energy change (ΔG°) of the enzyme catalysed reaction?

(h) What is Chargaff's rule?

Group—B

Answer any two questions from the following:

2. Describe the different chemical properties of protein. 5

3. What are R and T states of allosteric enzyme? How are they unregulated? 3+2

4. Explain the entropy change of a young man, old man and at their death. 5

5. What is 'micelle'? State the importance of 'micelle' in drug delivery. 1+4
Group—C

Answer any two questions from the following: \( 2 \times 10 \)

6. (a) Write some tests to check purity of fats and oils.
(b) Differentiate between oxidative and hydrolytic Rancidity.
(c) Briefly describe Lipid peroxidation.
(d) Which antioxidant is used in food preservation?

\[ 5+2+2+1 \]

7. (a) Elaborate the organization of eukaryotic DNA.
(b) How do you explain size of DNA molecule and contour length?
(c) What is melting temperature (Tm) of a DNA molecule?

\[ 5+3+2 \]

8. (a) What is meant by the term chemical shift of a particular proton in NMR spectroscopy?
(b) Distinguish between Stokes and anti-Stokes spectra.
(c) “IR spectra is often characterized as molecular fingerprint.” Justify this statement.
(d) Write down the biological applications of \( ^{32}P \) and \( ^{131}I \).

\[ 3+2+3+2 \]

C/14/M.Sc./1st Seme./B1T-101  
(Turn Over)
9. (a) Why multienzyme complexes are evolved?
(b) Discuss the functions of 'fatty acid synthase' multienzyme complex.
(c) What is $Q_{10}$ value?

2+6+2