2014

M.Sc.

1st Semester Examination

BIOCHEMISTRY

PAPER—BIC-102

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.

1. Answer any *five* from the following :   5×2

    (a) Differentiate between atomic orbitals and molecular orbitals.

    (b) What do you mean by relative centrifugal force ?

    (c) What is Zero point energy ?

    (d) What do you mean by 'bond dissociation energy' ? What is oxidative phosphorylation ?

(Turn Over)

(e) How does free energy is related with rate constant of a reaction ?

(f) State the importance of coupling reaction. Name one uncoupler.

(g) Define specific viscosity and intrinsic viscosity.

(h) What is specific activity of a radioactive substance ?

Answer any *two* from the followings :

2. (i) Why does the viscosity of blood depends on the number of RBC ?

   (ii) Give two examples of biological surfactant.   3+2

3. (i) 'Radioactivity is a nuclear phenomenon' — Explain.

   (ii) Identify 'X' in the following reaction :

   $$_{92}U^{235} + n_0^1 \rightarrow _{37}Rb^{95} + X + 3n_0^1 \qquad 3+2$$

4. What is redox potential ? State its biological importance.
                                                            2+3

5. What is primary condition for molecule to show IR spectra ? Write down the mathematical expression of E_V and $\overline{CO}_{0Sc}$ in IR spectroscopy.   2+3

Answer any *two* from the following questions : 2×10

6. (i) How resonance and H-bonds can change the IR spectra of a particular functional group or bond ?

   (ii) What do you mean by solvent effect with respect to UV–VIS spectroscopy ?   5+5

7. Write short notes on (any *two*) :   5+5

   (i) Metallic bond ;

   (ii) Biological importance of hydrophobic interaction and Hydrogen bond ;

   (iii) Two dimensional gel electrophoresis.

8. (a) What do you mean by 'Free energy' ?

   (b) What is the difference between ΔG and $\Delta G_O'$?

   (c) Explain the uniqueness of F_0F_1 ATP synthase which favour ATP formation in mitochondria.

   (d) Explain what is enthalpy.   1+2+5+2

9. (a) A chemical reaction has a $\Delta G_0' = -60$ KJ/mol. If this were an enzyme catalyzed reaction what can you predict about the kinetics ?

(b) If the activation energy of an uncatalyzed reaction is + 25 KJ/mol, what can you say about the activation energy for the enzyme catalyzed reaction.   5+5

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