5841A

B.Sc. (Prog./Hons.) PHYSICAL SCIENCES/I Sem. B

Paper—LSPT-101 : Biology I

(Introduction to Biology)

Time : 3 *Hours*   *Maximum Marks* : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt *Five* questions in all.

Question No. **1** is compulsory.

I.   (*a*)   Define any *four* of the following :   1½×4=6

(*i*)   pH

(*ii*)   Autotrophs

(*iii*)   Endemism

(*iv*)   Ecosystem

(*v*)   Gene

(*vi*)   Amino acids.

(b) Write any *one* major contribution of any *four* of the following scientists : 1×4=4

    (i) Kary Mullis

    (ii) G. Mendel

    (iii) Linus Pauling

    (iv) Rosalind Franklin

    (v) Charles Darwin

    (vi) T.H. Morgan.

(c) Write True *or* False : 1×5=5

    (i) Bacterial cell has a nucleus.

    (ii) All organisms on your campus make up a community.

    (iii) Cholesterol is a protein.

    (iv) Peptide bonds are present in proteins and nucleic acids.

    (v) Radioisotope ^{32}P has one more neutron that ^{31}P.

2. Write short notes on any *three* of the following : 5+5+5=15

    (a) Endosymbiotic theory

    (b) Central dogma

    (c) Model organisms

    (d) Phospholipids

    (e) Archaea.

3. (a) What are proteins ? Discuss their importance in biological systems.

    (b) Describe the structure of DNA and discuss *two* important functions of nucleic acids. $7\frac{1}{2}\times2=15$

4. Differentiate between any *five* of the following : $5\times3=15$

    (a) Homology and Analogy

    (b) Covalent and Ionic bonds

    (c) Codon and anticodon

    (d) Era and Epoch

    (e) Sirch and Cellulose

    (f) Prkaryotic and Eukaryotic cell.

5.   Explain the following :   5×3=15

    (a)   Probe

    (b)   Phylogeny

    (c)   Gene flow

    (d)   Buffers

    (e)   Enantiomeres.

6.   (a)   Discuss any *three* important properties of water molecule which are important for existence of life on earth.

    (b)   Discuss Oparin-Haldane hypothesis. Describe the experimental proof for abiotic synthesis of macromolecules.   7½×2=15

7.   (a)   What is epistasis ? Describe the various epistatic gene interactions with examples.

    (b)   Discuss any *three* functional groups with examples.

                                                       7½×2=15