This question paper contains 4 printed pages.]

Your Roll No. .....

563 A

B.Sc. (Prog.)/B.Sc. (Hons.)/I

BY 105 – BIOLOGY

(Admission of 2008 and onwards)

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

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

Answer Sections A and B on separate answer-books.

Section – A

Attempt **three** questions in all including Q. No. **1** which is compulsory.

SECTION – A (BOTANY)

1. (*a*) Differentiate :

(*i*) DNA from RNA 3

(*ii*) Covalent bond from ionic bond 2

(*iii*) Acidic amino acid from basic amino acid. 2

(*b*) Explain any *five* of the following :

(*i*) Radioactive isotope

(*ii*) Chemical evolution

(*iii*) Polar molecule

(*iv*) Middle lamella

(*v*) Unsaturated fatty acid

(*vi*) Phagocytosis 5

[P.T.O.

(*c*) Answer the following. Attempt any *one* :

(*i*) List the optical parts of a compound (light) microscope.

(*ii*) Why is it that plant cells do not lyse when placed in a hypotonic solution? 2

2. (*a*) With the help of a neat labelled diagram describe the ultrastructure of the plant cell wall. 6

(*b*) Answer any *two* of the following :

(*i*) Why is electron microscopy a valuable technique in biology?

(*ii*) Describe the formation of a peptide bond.

(*iii*) Give the significance of staining in microscopy. 4

3. (*a*) Write an account on isomers. 4

(*b*) Briefly describe the Fluid-Mosaic model explaining the structure of plasma membrane. 4

(*c*) Name a structural protein and a storage polysaccharide. 2

(*d*) Why is the evaporation of water from the leaves is beneficial to the land plants during hot weather? 2

4. Write an account on any *three* of the following :

(*a*) Stanley Miller's experiment

(*b*) Synthesis and breakdown of polymers of biomolecules

(*c*) Photosynthesis

(*d*) Buffers

(*e*) Bacteriophage. 12

Section – B (Animals)

Attempt **three** questions in all including Question No. **1** which is compulsory.

1. (*a*) Differentiate between the following :

(*i*) Ectotherms and Endotherms

(*ii*) Microevolution and Macroevolution

(*iii*) Genotype and Phenotype

(*iv*) Haploid cell and Diploid cell. 4

(*b*) Answer the following in brief :

(*i*) Name two commonly used multicellular model organisms used in genetic studies.

(*ii*) Give two important identifying features of mammals.

(*iii*) Name five kingdoms in Whittacker's classification.

(*iv*) What are stromatolites?

(*v*) Name the macromolecules detected by Southern and Western blotting techniques respectively. 5

(*c*) Expand the following :

(*i*) CdK

(*ii*) DNA

(*iii*) ATP

(*iv*) PDGF. 4

2. Draw neat labelled diagrams of the following (No description is required) :

(*a*) Stages of Mitosis

(*b*) Ultrastructure of an animal cell

(*c*) Cross section of basal body. 12

3. (*a*) Explain Darwin's theory of natural selection. 4

(*b*) What is speciation? Describe *two* main modes of speciation in nature. 8

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

(*a*) Endosymbiotic origin of Mitochondria

(*b*) Cell fractionation

(*c*) Cell cycle clock

(*d*) Mass extinctions. 4, 4, 4