Question Paper Specific Instructions

Please read each of the following instructions carefully before attempting questions:

There are EIGHT questions in all, out of which FIVE are to be attempted.

Questions no. 1 and 5 are compulsory. Out of the remaining SIX questions, THREE are to be attempted selecting at least ONE question from each of the two Sections A and B.

Attempts of questions shall be counted in sequential order. Unless struck off, attempt of a question shall be counted even if attempted partly. Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.

All questions carry equal marks. The number of marks carried by a question/part is indicated against it.

Answers must be written in ENGLISH only.

Neat sketches may be drawn, wherever required.

SECTION A

Q1. (a) Explain the role of endoplasmic reticulum in lipid biosynthesis. 8
(b) Explain the types of transposons with a note on any two transposition events. 8
(c) Describe the different types of vectors. 8
(d) Explain how mimicry helps animals to lead a successful life. 8
(e) Discuss the various types of zoological nomenclature with suitable examples. 8
Q2. (a) Discuss the application of pedigree analysis in identifying diseases.  
    (b) What are lysosomes? Discuss their role in intracellular digestion. Give an example of lysosomal storage disorder.  
    (c) Describe the steps involved in gene regulation in eukaryotes.

Q3. (a) With a neatly labelled diagram, explain sodium-potassium pump and its role in membrane transport.  
    (b) Explain the mode of speciation in evolution with examples.  
    (c) Explain how protein synthesis is the key to the expression of biological information.

Q4. (a) Explain how unknown five-toed Condylarthra evolved in Equus. State the evolutionary pattern in each geological era.  
    (b) Discuss the structure and functions of Ribosomes and Golgi bodies with an emphasis on secretion of proteins.  
    (c) Describe the mechanism of DNA replication.
SECTION B

Q5.  
(a) Explain enzyme kinetics with suitable examples.  
(b) Explain how the biological energy transformations obey the laws of thermodynamics.  
(c) Explain the extrinsic pathway for initiation of blood clotting.  
(d) Describe the respiratory regulation of acid-base balance in body fluids.  
(e) What is neoteny? Discuss the phenomenon in Amphibia giving suitable example.

Q6.  
(a) Draw the structure of cAMP. Explain how cAMP acts as second messenger for β-adrenergic receptor system.  
(b) Describe the molecular mechanism of skeletal muscle contraction.  
(c) Define cloning. Explain somatic cell nuclear transfer method with suitable examples.

Q7.  
(a) Discuss the transport of oxygen in the blood. Give an account of various factors that shift oxygen-hemoglobin dissociation curve.  
(b) Explain enzyme specificity with suitable examples. How is enzyme activity controlled?  
(c) Describe the process of metamorphosis in frogs and explain the role of thyroxin.

Q8.  
(a) What is embryonic induction? Describe the mechanism of induction giving examples.  
(b) Enlist the composition of bile. Discuss the role of bile salts in fat digestion and absorption.  
(c) What is immunity? Giving suitable examples explain humoral and cell mediated immunity.