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. Write a relative account of each of the following: 8x5=40

(a) Transport of small and large molecules across plasma membrane 8
(b) Euploidy and Polyploidy 8
(c) Homology and Analogy 8
(d) Palearctic and Nearctic regions 8
(e) Plasmids and Cosmids 8
Q2. (a) Describe the ultrastructure of mitochondrion and explain why it is considered as a symbiotic cell organelle.  
(b) What is Transcription? Explain the initiation complex and the events leading to the formation of mRNA in eukaryotes.

Q3. (a) What is signal transduction? With a labelled diagram, explain the steps involved.  
(b) Discuss the role of various isolating mechanisms in speciation.

Q4. (a) Give a historical account of naming an animal species and the validity of binominal system, adding a note on the role of International Code of Zoological Nomenclature (ICZN).  
(b) What is continental drift? When did it occur and what are its evidences?
SECTION B

Q5. Write notes on each of the following: 8×5=40
(a) Role of actin and myosin in muscle contraction 8
(b) Types of placenta 8
(c) Embryo transfer 8
(d) Cyclic AMP 8
(e) Ultrafiltration in mammalian kidney 8

Q6. (a) Explain what initiates the process of blood coagulation and discuss the role of different factors. 20
(b) Describe the complexity of inner ear and its mechanism of hearing. 20

Q7. (a) Give an account of the structural and functional characteristics of IgE and IgM immunoglobulins. 20
(b) What is oxidative phosphorylation? Describe the steps involved in the process and add a note on the role of enzymes at every step, with a schematic diagram. 20

Q8. (a) Explain the process of regeneration giving suitable examples from vertebrates. 20
(b) Describe the fate map of gastrula with reference to frog. 20