

**ZOOLOGY**  
**Paper II**

Time Allowed : Three Hours

Maximum Marks : 200

**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.

Question no. 1 & 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 chronological 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 answer book 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'**

1. Answer the following : 8×5=40
  - (a) Define and explain Mendel's Law of segregation. 8
  - (b) Explain the mechanism of fossil formation and the conditions essential for fossilization. 8
  - (c) Explain receptor mediated endocytosis and up-take of cholesterol in cells. Draw labelled diagram. 8
  - (d) Define cladistics. How will you solve when incongruence arises between cladistics and taxonomic systems. 8
  - (e) Explain  $\beta$ -globin gene regulation in humans. 8
2.
  - (a) What are G-proteins ? Explain their role in signalling pathway. Why is the study of cell signalling important ? 20
  - (b) Describe the events that occur in a cell during prometaphase and metaphase. Draw labelled diagrams. 20
3.
  - (a) What is Transgenesis ? Describe the methods employed for the production of transgenic animals. 20
  - (b) What is the impact when population upsets genetic equilibrium ? Describe in detail the factors responsible for deviation of genetic equilibrium. 20

4. (a) Define Natural Selection. Comment on normalizing selection. Mention the salient features of normalizing selection. 15
- (b) What is DNA finger printing ? Comment on the applications of DNA finger printing in human Forensic Sciences. 15
- (c) Explain lysosomal disorders in humans. 10

### SECTION 'B'

5. Answer the following in not more than 150 words each. 8×5=40
- (a) Contrast the general properties of innate and acquired immune responses. 8
- (b) Differentiate between Amnion and Chorion type of placenta. 8
- (c) Discuss the role of alcohol and chemicals as teratogens. 8
- (d) Explain the chemical formula of a generalized amino acid and show peptide bond formation. 8
- (e) Explain the structural components of Haemoglobin molecule and discuss its role in oxygen transport. 8
6. (a) What is blood coagulation ? Discuss the factors and mechanism of coagulation. 20
- (b) Explain morphogenetic movements with reference to frog, chick and human embryonic development. Draw labelled diagrams. 15
- (c) Explain the structure and importance of cholesterol. 5
7. (a) Draw the basic structure of an immunoglobulin molecule bound to an epitope of an antigen. Label the heavy and light chains. Explain the types of Immunoglobulins. 20
- (b) Discuss the factors for male and female infertility and describe the details of IVF methods currently used. 20
8. (a) Give an account of male and female sex hormones with reference to humans and discuss their role in reproduction. Mention the interplay of pituitary secretions. 20
- (b) Explain the structure of cyclic AMP. How is it formed ? Why is it called second messenger ? With a labelled diagram, explain its role in glucose metabolism in a liver cell. 20