

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 Nos. 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 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 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

1. Write notes on the following : 8×5=40
- (a) Sex determination in nematodes
 - (b) Protective mimicry and warning mimicry
 - (c) Convergent evolution and divergent evolution
 - (d) Post-transcriptional gene regulation
 - (e) Concept of 'cladistics'
2. Answer the following in detail :
- (a) Considering the inheritance of earlobes in humans in a given population, 84% of people have free earlobes, whereas 16% of people have attached earlobes. Calculate the frequencies of **F** and **f** alleles and frequencies of three different genotypes with reference to Hardy-Weinberg law. 20
 - (b) Describe the process of sex determination in *Drosophila* with emphasis on polyploidy and gynandromorphism. 20
3. Answer the following :
- (a) What is meant by 'C-value' paradox? Describe the ultrastructure of chromatin with emphasis on nucleosome and solenoid model of chromatin. 20
 - (b) What are fossils? Describe the process of fossilization in brief. Discuss the evolution of elephant in brief. Draw suitable diagrams. Prepare a tabulated account on one separate sheet. 20
4. Answer the following :
- (a) What is a congenital disease? Enlist various congenital diseases of humans. Discuss each one by mentioning symptoms, consequences and remedial measures. 20
 - (b) What is genome mapping? Discuss in brief the progress made in understanding human genome. Provide state-of-the-art information. Discuss the applicability advantage of exploring genome mapping of plants and animals. 20

SECTION—B

5. Define and differentiate the following in not more than 150 words each : 8×5=40

- (a) Polyunsaturated fatty acids (PUFA) and Highly unsaturated fatty acids (HUFA)
- (b) Tropomyosin and Troponin
- (c) Creatine and Creatinine
- (d) Vision and Olfaction in man
- (e) Neoteny and Paedogenesis

6. Answer the following :

- (a) What is meant by teratogenesis? Describe in detail about genetic and environmental teratogenesis. Give suitable examples. 20
- (b) What are hormones? Who discovered these and in which year? Provide a tabulated chart of their classification. Briefly narrate biosynthesis and functions of steroid hormones. 20

7. Answer the following in detail :

- (a) How are airborne chemicals perceived? Describe the structure and physiology of specific receptors concerned with olfaction in humans. 20
- (b) Describe the physiological role of gonadotrophic hormones on puberty and the regulation of menstrual cycle in women. 20

8. Answer the following in detail :

- (a) Discuss organogenesis of eye with associated sequential steps. Support your answer with diagrams in a tandem manner. 20
- (b) Define synapse and different types of synapses. Mention different types of neurotransmitters and their role in synaptic transmission. 20
