

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.

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.

Neat sketches may be drawn, wherever required.

Answers must be written in **ENGLISH** only.

SECTION A

- Q1.** (a) Briefly explain the contributions of George Gamow, Har Gobind Khorana, Marshall Nirenberg and Severo Ochoa in deciphering the genetic code. 8
- (b) How do proteins move through the Golgi apparatus ? Explain. 8
- (c) Explain synonymy and homonymy in context of the International Code of Zoological Nomenclature. 8
- (d) Briefly discuss the role of geographical and reproductive isolations in speciation. 8
- (e) Describe different types of intercellular junctions in animal cells. 8

- Q2.** (a) Explain molecular mechanism of chromosome movements in eukaryotes. 15
- (b) What is an Operon ? Explain how a polycistronic structural gene is regulated by a common promoter and a combination of regulatory genes in a *lac*-operon. 15
- (c) Give an account of ancestry of Miocene and Pliocene proboscideans. 10
- Q3.** (a) Define Linkage. Give an illustrated account of complete, incomplete and sex linkages. 15
- (b) How does continental drift theory explain the discontinuous and restricted distribution of organisms ? 15
- (c) Explain the phenomenon of endocytosis in organisms with suitable examples. 10
- Q4.** (a) Describe the principle, procedure and applications of DNA fingerprinting. 15
- (b) Define Mimicry. Enlist its causes. Explain different types of mimicry with suitable examples. 15
- (c) Give the structure and functions of nuclear envelope. 10

SECTION B

- Q5.** (a) Explain quaternary structure of haemoglobin. 8
- (b) What is Bohr's effect ? How does it promote gaseous exchange in the lungs and the tissues ? 8
- (c) What are oligosaccharides ? Give structural formulae and functions of biologically important maltose, sucrose and lactose. 8
- (d) Explain morphogenetic movements in gastrulation of frog. 8
- (e) Briefly write about hormonal control of digestive secretions in humans. 8
- Q6.** (a) Describe structural differences among glycogen, starch and cellulose and elaborate their functions. 15
- (b) Explain countercurrent mechanism of urine concentration in the kidneys of higher vertebrates. 15
- (c) What is invasive placenta ? Discuss its types, causes and risk factors. 10
- Q7.** (a) Give schematic representation of electron transport chain. Describe the energy coupling mechanism in oxidative phosphorylation using chemiosmotic model. 15
- (b) Enumerate different blood coagulation factors. Explain their role in the process of blood coagulation. 15
- (c) Classify Vitamins. Discuss deficiency symptoms of fat soluble vitamins. 10
- Q8.** (a) Why do cells die ? Discuss apoptosis, necrosis and autophagy. Add a note on "cell death proteins". 15
- (b) Explain hormonal regulation of menstrual cycle in women. 15
- (c) Describe the structure and functions of neutral fats. 10

