JHGT–B–ZOLY

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.

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.

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.

Answers must be written in ENGLISH only.

SECTION—A

1. *(a)* Explain the process of protein glycosylation in the lumen of rough endoplasmic reticulum. 8

(b) How does lactose induce *lac* operon? Explain. 8

(c) How are fossils formed? Describe the methods of dating of fossils. 8

(d) With the help of a diagram, explain the constitution of a cosmid and mention its advantages over a plasmid in recombinant technology. 8

(e) Describe the ultrastructure of nuclear pore and its functions. 8

2. *(a)* Describe the constitution of a basic transcription unit and the process of initiation of transcription in prokaryotes. 15

(b) With suitable example, explain the concept of multiple allelism. 15

(c) Explain the data required for holotype labelling. Add a note on lectotype and neotype designation. 10

3. *(a)* Describe the mechanism of evolution by natural selection. 15

(b) What is meant by genetic dictionary? Explain the concept of degeneracy of genetic code. 15

(c) Describe the steps of DNA synthesis occurring on lagging strand of DNA. 10

4. *(a)* Explain Urey and Miller experiment. Give its contribution in the development of modern concept of origin of life. 15

(b) With suitable examples, explain the role of Golgi cisternae in protein sorting mechanism. 15

(c) What do you mean by a genetic clone? Describe a protocol of cloning of a recombinant DNA. 10

SECTION—B

5. *(a)* What do you mean by programmed cell death? Highlight its role in the metamorphosis of tadpole larva into adult frog. 8

(b) Explain activation energy-based mechanism of enzyme catalysis. 8

(c) Describe the role of haemoglobin in the transport of carbon dioxide in human body. 8

(d) Illustrate the structure of a dipeptide and mention the characteristics of the peptide bond. 8

(e) How does internal ear control body balance? Explain. 8

6. *(a)* Differentiate between simple and complex lipids. Highlight the cellular importance of phospholipids. 15

(b) What is meant by fate map? Describe the designing of fate map of gastrula in frog. How does it differ from that in chick? 15

(c) Describe the role of kidneys in acid-base regulation. 10

7. *(a)* Explain the roles of helper and cytotoxic T-cells in immunity. 15

(b) Describe the development of eye in mammals. 15

(c) Comment on the source of energy during muscle contraction under normal and intensive exercise conditions. 10

8. *(a)* Highlight the mechanism of nerve conduction across a synapse with respect to excitatory neurotransmitter. 15

(b) *(i)* Explain ATP utilizing reactions of glycolytic pathway. 5

(ii) Write NADH and $FADH_2$ producing reactions of Krebs cycle. 10

(c) Describe in detail the hormonal regulation of oocyte maturation and ovulation in human females. 10

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