

ZOOLOGY (Paper II)

Time Allowed : Three Hours

Maximum Marks : 250

QUESTION PAPER SPECIFIC INSTRUCTIONS

(Please read each of the following instructions carefully before attempting questions)

There are EIGHT questions divided in two Sections.

Candidate has to attempt FIVE questions in all.

Question Nos. 1 and 5 are compulsory and out of the remaining, any THREE are to be attempted choosing at least ONE question from each Section.

The number of marks carried by a question/part is indicated against it.

Wherever any assumptions are made for answering a question, they must be clearly indicated.

Word limit in questions, wherever specified, should be adhered to.

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.

SECTION 'A'

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| 1. | (a) | Compare the function of mitochondrial and lysosomal enzymes in cellular metabolism. | 10 |
| | (b) | What is interrupted gene? What is its relation with exons and introns? Explain the functioning of interrupted gene in lower eukaryotes. | 10 |
| | (c) | Describe the phenomena of mimesis and crypsis in animal with suitable examples. | 10 |
| | (d) | What are sex-linked and sex-limited characters? Explain by suitable examples their mode of transmission. | 10 |
| | (e) | What is taxonomic hierarchy? Explain biodiversity on the basis of molecular taxonomy using suitable examples. | 10 |
| 2. | (a) | Describe the structural organisation of a prokaryotic cell. What are the traits and functions in which it differs from a eukaryotic cell? | 20 |
| | (b) | How are evolutionary patterns and processes affected by the dual operation of mutation and natural selection? Give examples. | 15 |
| | (c) | What is recombinant DNA technology? How is it done? Discuss its applications. | 15 |
| 3. | (a) | How does the protein synthetic machinery operate in a prokaryote? Mention the various functions of protein in eukaryotes and prokaryotes. | 15 |
| | (b) | Using the fossil history of humans, reconstruct the stages of evolution of present day Homo sapiens, mentioning the geological periods as well. | 20 |
| | (c) | Which eukaryotes do not contain repetitive DNA? Give a brief account of biological macromolecules found in all living organisms. | 15 |
| 4. | (a) | Delineate the production of new combinations of alleles, encoding a novel set of genetic informations. What is its role in genetic engineering? | 20 |
| | (b) | Give an account of the structure and function of the organelles considered unusual in the cell cytoplasm. | 15 |
| | (c) | What are RNA genes? State the role of ribozymes and microRNA in protein synthesis. | 15 |

SECTION 'B'

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| 5. | (a) | Mention the different steps in the metabolism of iron. What are the functions that require iron? Add a note on the regulatory mechanisms that ensure stable titers of iron in the body. | 10 |
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	(b)	What is cyclic AMP? How is it derived? Mention the role of cyclic AMP in eukaryotic cells.	10
	(c)	What is Hox gene? Give the properties of Hox Gene and its cluster. What role do they play in humans?	10
	(d)	Describe the short-term and long-term effects of stress on human body.	10
	(e)	With suitable illustrations delineate the role of triiodothyronine and tetraiodothyronine in amphibian metamorphosis.	10
6.	(a)	Describe the mechanism of synthesis of protein and steroid hormones. How do they affect cellular activity?	15
	(b)	Draw a labelled diagram of human eye and discuss the function of each layer. Mention the role of eye pigments in visual perception under light and dark conditions.	15
	(c)	Describe the role of neuro-endocrine factors and Sertoli cell secretions on spermatogenic functions of human seminiferous tubules.	20
7.	(a)	Mention the hypothalamic-adenohypophyseal secretions that stimulate, sustain and regulate adrenal cortex functions. Add a note on feedback systems.	15
	(b)	Using villi as the basis of classification, describe the various types of placenta in eutherian mammals. Add a note on placental hormones and their role in pregnancy and birth.	20
	(c)	What is Hardy-Weinberg's law? Give examples to establish its validity and limitations.	15
8.	(a)	What are erythroid cells? Explain the RBC lineage in balancing haemoglobin manufacture.	15
	(b)	Differentiate between puberty and menopause and discuss their neuro-endocrine basis. Mention the aberrant symptoms and disorders of both.	20
	(c)	What is anti-vitamin? Classify and describe the function of vitamins in human nutrition.	15