

ZOOLOGY

(Paper I)

Time Allowed : Three Hours

Maximum Marks : 300

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.

SECTION 'A'

1. Answer concisely the following in about 150 words each: **15×4=60**
- (a) What was the need to create Parazoa against Porifera when the latter existed?
 - (b) Provide diagrammatic representation of the stages of conjugation in *Paramecium* and comment on its autogamy.
 - (c) Compare the skull of *Rhynchocephalia* with that of *Crocodylia*.
 - (d) Draw a well-labelled schematic diagram of the feeding current through the gut of *Branchiostoma*, and comment on the mechanism of feeding and digestion.
2. Answer any two of the following: **30×2=60**
- (a) Describe the great departures shown by parasitic forms from the diagnostic features of free living forms among *Copepoda*.
 - (b) Describe the structure and function of water-vascular system in echinoderms.
 - (c) Give the salient features of *Apterygota* and *Pterygota*.
3. (a) What is mutable connective tissue? Describe the various functions it serves and the mechanism of its working. **30**
- (b) With the help of a well-labelled diagram (ventral aspect), describe the heart of rabbit showing major blood vessels. Add a note on the mechanism of circulation through the heart. **30**
4. (a) Differentiate between open and closed circulatory systems. **30**
- (b) Define Migration. Add a detailed account of migration in fishes with relevant examples. **30**

SECTION 'B'

5. Answer, in brief, the following in about 150 words each: **15×4=60**
- (a) Draw a flow diagram of nitrogen cycle, and give accounts of nitrogen fixation, nitrification and denitrification.
 - (b) Give the mechanism of ozone degradation by chlorofluorocarbons.
 - (c) What is crypsis? Discuss the significance of crypsis in different animals.

- (d) Discuss with suitable examples the importance of the measure of central tendency and dispersion.
6. Answer any two of the following: **30×2=60**
- (a) “A population is a self-regulating system.” (Wynne Edwards.) Explain.
- (b) Define memory, and discuss how short- and long-term memory are stored.
- (c) Distinguish between in situ and ex situ conservation of animals. Provide suitable examples.
7. (a) What is chi-square (χ^2) test? Add a detailed account on the computation of chi-square for tests of independence, homogeneity and goodness of fit, using biological data. **30**
- (b) Discuss the effect of hormones on sexual, aggressive and maternal behaviour. **30**
8. (a) Discuss briefly the degradation of terrestrial ecosystem by human activities. **30**
- (b) Discuss the theoretical basis of spectrophotometry with reference to the Beer-Lambert law. Write an account of the instrumentation, maintenance and application of spectrophotometer. **30**