

2023

ZOOLOGY — HONOURS

Paper : CC-14

(Evolutionary Biology)

Full Marks : 50

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Answer **question no. 1** and **any four** questions from the rest.

1. Answer **any five** questions of the following : 2×5
- (a) Define species.
 - (b) What is Darwinian fitness?
 - (c) What do you mean by sibling species?
 - (d) Define gene pool.
 - (e) What is ring species?
 - (f) What is reducing atmosphere?
 - (g) What is Directional Selection?
 - (h) What is cline?
 - (i) What is 'hot dilute soup'?
2. Explain the difference between Lamarck and Darwin's theory of evolution. What do you mean by microevolution and macroevolution? Explain how adaptive radiation helps in speciation with special reference to Darwin finches. What is punctuated equilibrium? 3+3+3+1
3. What is fossil? Describe different types of fossils. Enumerate one method for determination of the age of fossil. 2+5+3
4. Describe the characteristic features of — (a) Neanderthal man (b) *Australopithecus* (c) *Equus*
(d) *Eohippus*. 2½+2½+2½+2½
5. (a) Explain with example how behaviour difference helps in species isolation.
(b) What is 'hybrid breakdown'?
(c) Comment on the role of Geographical barrier in Speciation. 4+3+3

Please Turn Over

6. Distinguish between :
- (a) Homologous organ and Analogous organ.
 - (b) Sympatric speciation and Parapatric speciation.
 - (c) Anagenesis and Cladogenesis.
 - (d) RNA world hypothesis and DNA world hypothesis. 2½+2½+2½+2½
7. (a) Briefly describe the chemical reactions that lead to peptide formation in primitive earth.
- (b) What is 'Coacervate'?
 - (c) What is protocell?
 - (d) What were the sources of energy in primitive earth? 4+2+2+2
8. (a) Mathematically prove that gene frequencies and genotype frequencies do not change from generation to generation in a Hardy-Weinberg equilibrium.
- (b) In a population frequency of straight hair individuals with homozygous genotype was 300, straight hair individuals with heterozygous genotype was 300 and curly hair individuals was 400. Test whether this population is in H-W equilibrium or not.
 - (c) Mention the causes of K-T extinction. 4+4+2
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