2022

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) What is mass extinction?

(b) What is coacervate?

(c) What is parapatric speciation?

(d) Define 'parsimony'.

(e) What is the 'golden era' of reptiles? Name different periods of this era.

(f) Define 'biological species'. Mention two limitations of this species concept.

(g) What is index fossil?

(h) What is adaptive convergence? Give one example.

(i) Define 'Darwinian fitness'.

2. (a) Define allopatric speciation. How it differs from sympatric speciation? Explain 'classical allopatric speciation' with a suitable example.

(b) Briefly narrate the process of species formation by chromosome rearrangements taking example from *Drosophila*. (2+2)+(3+3)

3. (a) State the atmospheric condition of pre-biotic earth.

(b) With suitable mathematical model explain how migration affects the allele frequency in a population.

(c) Briefly describe the radio-carbon dating method of fossil. 2+4+4

4. (a) State the characteristic features of

(i) *Australopithecus*; (ii) Cro-magnon man.

(b) Define isolating mechanism. Briefly describe different types of prezygotic isolating mechanism with suitable example. (2+2)+(1+5)

5. 'M' and 'N' blood groups of man are due to L^M and L^N alleles, respectively. Alleles are co-dominant. A sample of 426 individuals was typed for MN blood group with following results :

M	MN	N
238	152	36

(a) Calculate the frequency of L^M and L^N alleles.

(b) Find whether the population is in Hardy-Weinberg Equilibrium.

(c) If frequency of L^N is 0.3, how many individuals in a population of 1000 would be expected with MN blood group? 4+4+2

6. (a) Give an account of progressive structural changes in evolution of horse with respect to teeth and toes.

(b) What is neo-Darwinism? Name the factors that generate variations in genome according to neo-Darwinian concept. (3+3)+(1+3)

7. (a) Define natural selection. Explain directional selection with the help of suitable example.

(b) What is genetic drift? Give one suitable example of natural genetic drift event. (2+3)+(2+3)

8. Write short notes on (*any two*) : 5×2

(a) Adaptive radiation in finches

(b) Urey-Miller experiment and its significance in origin of life theory

(c) Trends in changes in structure of brain and limbs in human evolution.