Total number of printed pages–7

3 (Sem–6/CBCS) ZOO HC 2

2023

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ZOOLOGY

(Honours Core)

Paper : ZOO–HC–6026

(Evolutionary Biology)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Find out the correct answer from the following : 1×7=7

   (i) What was the mode of respiration for the prokaryotes during biological evolution ?

   (a) Aerobic

   (b) Cellular

   (c) Anaerobic

   (d) External

Contd.

(ii) Evolution can be defined as

(a) History of race

(b) Development of race

(c) History and development of race with variation

(d) Progressive history of race

(iii) Which of the following principles is not part of Darwin's theory of evolution by natural selection ?

(a) Variation occurs among individuals in a population

(b) Mutations are the ultimate source of genetic variation

(c) Individuals that possess the most favourable variations have the best chance of reproducing

(d) More individuals are born than will survive

(iv) The factor that leads to founder effect in a population is

(a) Mutation

(b) Natural selection

(c) Genetic drift

(d) Genetic recombination

(v) Which is the earliest known ancestor of man ?

(a) Dryopithecus

(b) Homo erectus

(c) Homo habilis

(d) Australopithecus

(vi) The traditional use of phylogenetic analysis is to discover evolutionary relationships among species.

*(State True **or** False)*

(vii) A species inhabiting different geographical areas is known as

(a) Allopatric species

(b) Sympatric species

(c) Sibling species

(d) Biospecies

2. Answer the following : 2×4=8

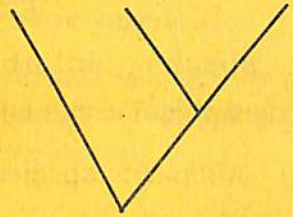
(i) What are coacervates ?

(ii) The following data shows four amino acids found across three species :

Species	Amino acid sequence
Dog	Ile–Cys–Trp–Ser
Monkey	Ile–Cys–Trp–Ser
Frog	Met–Cys–Trp–Arg

Which phylogenetic tree best represents the information in the chart ?

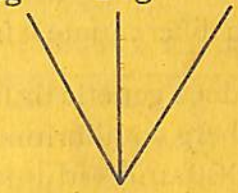
(a) Monkey Frog Dog



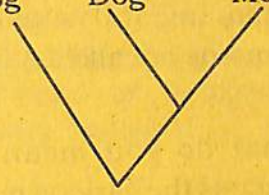
(b) Dog Monkey Frog



(c) Frog Dog Monkey



(d) Frog Dog Monkey



(iii) What is gene flow ?

(iv) Concept of kin selection.

3. Answer ***any three*** of the following : 5×3=15

(i) Explain the concept of "Three Domains of Life" as an evolutionary model of phylogeny.

(ii) Write short note on Neo-Darwinism.

(iii) Discuss adaptive radiation in the context of Darwin's finches.

(iv) What are the unique hominin characters which differentiate it from the primates ?

(v) How does genetic drift affect the Hardy-Weinberg equilibrium ? In a population of 1000 individuals 360 belong to genotype AA, 480 to Aa and the remaining 160 to aa. What will be the frequency of allele A in the population ?

4. (a) What do you mean by speciation ? Discuss the various modes of speciation. 2+8=10

Or

(b) Describe Stanley Miller's experiment and explain how does it prove the biochemical theory of origin of life. 10

5. (a) Discuss Hardy-Weinberg law of equilibrium citing the evolutionary forces that upset the law. 10

Or

(b) What is fossil ? Describe the process of fossilization. Enumerate the methods for determination of the age of a fossil. 1+5+4=10

6. (a) What are the major five mass extinction events that occurred in the history of Earth ? Discuss them with special emphasis on its causes and effects. 5+5=10

Or

(b) Give the concept of phylogenetic tree. What are the different methods of molecular phylogenetic analysis ? State the significance of phylogenetic trees in evolutionary biology. 2+6+2=10
