Total number of printed pages–7

63/1 (SEM–6) CC14/ZOOHC 6146

2024

ZOOLOGY

Paper : ZOOHC 6146

(Evolutionary Biology)

Full Marks : 60

Pass Marks : 24

Time : Three hours

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

1. Choose the correct answer : ***(any five)*** 1×5=5

   (a) Which era is known as the age of reptiles ?

   (i) Cenozoic

   (ii) Mesozoic

   (iii) Paleozoic

   (iv) Ordovician

(b) The Archaeopteryx is considered as the missing link between

(i) reptiles and birds

(ii) birds and mammals

(iii) amphibians and reptiles

(iv) amphibians and mammals

(c) The process of speciation produced by the restriction of gene flow between populations due to physical/ geographical barrier is known as

(i) allopatric speciation

(ii) sympatric speciation

(iii) parapatric speciation

(iv) peripatric speciation

(d) Which RNA sequence can be used to distinguish organisms at the species level ?

(i) tRNA

(ii) mRNA

(iii) nRNA

(iv) siRNA

(e) Darwin's finches are examples of

(i) kin selection

(ii) mutation

(iii) bottleneck effect

(iv) adaptive radiation

(f) Mammals that have modified their fore limbs for digging are known as

(i) fossorial

(ii) cursorial

(iii) arboreal

(iv) volant

(g) Which of the following fossils is formed by the penetration of mineral-rich water into the pores of organic tissues and deposition of the minerals to form internal cast ?

(i) Mineralisation

(ii) Moulds

(iii) Petrification

(iv) Carbonisation

(h) Which scientist postulated recapitulation theory ?

(i) Ernst Haeckel

(ii) Louis Pasteur

(iii) S. L. Meller

(iv) Hugo de Vries

(i) The concept of *'survival of the fittest'* is associated with

(i) Jean-Baptiste Lamarck

(ii) Charles Darwin

(iii) Alfred Russel Wallace

(iv) Ernst Haeckel

(j) "Evolution occurs in small, incremental steps over long period of time." This concept is known as

(i) gradualism

(ii) punctuated equilibrium

(iii) speciation

(iv) adaption radiation

2. Answer the following questions : ***(any five)*** 2×5=10

(a) Define biogeny.

(b) What are the three domains of lfie ?

(c) "The genetic code is universal." Justify the statement.

(d) What do you mean by kin selection ?

(e) Give *two* factors that disrupt Hardy-Weinberg equilibrium.

(f) What is a clade ?

(g) What is the significance of cytochrome C in determining evolutionary relationship ?

3. Answer the following questions : ***(any five)*** 5×5=25

(a) Write a short note on the types of speciation.

(b) Explain the endosymbiotic hypothesis with suitable diagram.

(c) Differentiate between homologous and analogous structures with examples.

(d) Discuss in brief about the role of mutation and migration in allele frequency variation.

(e) Write a short note on neutral theory of molecular evolution.

(f) What is a phylogenetic tree? Write the steps involved in the construction of phylogenetic tree. 2+3=5

(g) Write a short note on genetic drift.

(h) Discuss in brief about the concept of Darwinism.

(i) Write a note on molecular analysis of human origin.

4. Answer the following questions : ***(any two)*** 10×2=20

(a) Describe the sequence of evolution of horse.

(b) Define isolating mechanism. Elaborate on the types of isolating mechanism with examples. 2+8=10

(c) Describe the major mass extinction event. Write a note on K-T extinction. 5+5=10

(d) What do you mean by natural selection? What is the advantage of heterozygosity? Describe the types of selection process with suitable examples. 2+2+6=10