

[This question paper contains 4 printed pages.]

Sr. No. of Question Paper : 1001 E Your Roll No.....

Unique Paper Code : 223601

Name of the Course : B.Sc. (H)

Name of the Paper : Evolutionary Biology [ZOHT-610]

Semester : VI

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Answer five questions in all.
3. Question No. 1 is compulsory.

1. (a) Define the following terms :

(i) Living fossil

(ii) Pseudogene

(iii) Gap penalty

(iv) Panmixis

(v) Missense mutation

(5)

(b) Differentiate between the following pairs :

(i) Coacervates and microspheres

(ii) Orthologous and paralogous genes

P.T.O.

(iii) Stabilising selection and disruptive selection (6)

(c) Explain briefly any three of the following :

(i) Prokaryotic cells have given origin to aerobic eukaryotic cells.

(ii) Synonymous sites change more rapidly than non-synonymous sites.

(iii) Molecular record can be used to determine phylogenetic relationships.

(iv) *Equus equus* would have been extinct had it not been for late Pliocene radiation.

(v) Batesian mimicry invokes density dependent selection. (6)

(d) State the contributions of :

(i) S Miller

(ii) M Kimura (2)

(e) Fill in the blanks :

(i) Similarities between marsupials in Australia and placental mammals elsewhere are examples of _____ .

(ii) Reptilian features in Archeopteryx were _____ and _____ .

(iii) Philosophic Zoologique was written by _____ .

(iv) "Great dying" is common name given to _____ extinction as almost 96% of all living species became extinct on Earth. (4)

(f) Expand the following :

(i) OTU

(ii) PAUP

- (iii) NCBI
- (iv) ORF (4)
2. (a) Describe Darwin's concept of natural selection. What were the main weaknesses of this concept? How was the concept later modified? (4,2,3)
- (b) Justify the statement: fossil evidence provides strong support for evolution. (3)
3. Explain different types of isolating mechanisms with suitable examples. Discuss the role played by isolating mechanisms in evolution. (12)
4. (a) Outline man-ape differences. What advantages could bipedalism have offered to early hominids? (6)
- (b) Describe multiple sequence alignment and its application. (6)
5. (a) Explain K-T mass extinction and its biological consequences. (5)
- (b) With suitable examples, discuss the adaptive radiation in finches on the Galapagos Islands. (7)
6. (a) Define Hardy Weinberg Law. How can the law be applied to human populations? (5)
- (b) Discuss the ways in which shifts in gene frequencies in Mendelian populations may occur without selection. (7)
7. Write short notes on any three :
- (a) RNA world

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(b) Role of polyploidy in evolution

(c) UPGMA with example

(d) Microevolution

(e) Industrial melanism

(4,4,4)

(1000)