

(7 pages)

Reg. No. :

Code No. : 5450

Sub. Code : ZZOM 24

M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

Second Semester

Zoology – Core

EVOLUTION

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. According to Lamarckism, how are the changes acquired by an organism passed on to its offspring?
- (a) Through genetic inheritance
 - (b) Through random mutations
 - (c) Through natural selection
 - (d) Through environmental factors

2. What played a significant role in human evolution besides natural selection, genetic drift and genetic mutation?
- (a) Random chance
 - (b) The development of culture and technology
 - (c) Cosmic radiation
 - (d) Environmental disasters
3. What is neutral evolution?
- (a) Changes in DNA sequences that confer an advantage to the organism and increase its fitness
 - (b) Changes in DNA sequences that do not affect the function of the protein encoded by the gene
 - (c) Random changes in the frequency of DNA sequences in a population over time.
 - (d) Studying the effects of climate change on biodiversity.
4. Macroevolution denotes
- (a) The study of how mutations occur in the phenotype of organisms over time
 - (b) The study of how changes occur in the DNA sequences of genes and genomes over time
 - (c) The study of how new species and higher taxonomic groups arise from pre-existing ones.
 - (d) The study of how microorganisms evolve over time.

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5. The node of a phylogenetic tree is _____
- (a) A branch point representing a common ancestor of two or more lineages
 - (b) A leaf representing a modern species or taxon
 - (c) A symbol used to denote a fossil species
 - (d) A term used to describe the process of evolution within a single lineage.
6. Western blot technique is _____
- (a) An immunological technique used to detect the presence of specific proteins in a sample
 - (b) A technique used to purify proteins from a mixture
 - (c) A technique used to amplify DNA fragments
 - (d) A technique used to identify specific genetic mutations.
7. In DNA, which nitrogenous base pairs with adenine is
- (a) Guanine
 - (b) Cytosine
 - (c) Uracil
 - (d) Thymine
8. How do restriction enzymes cut DNA?
- (a) They cleave the hydrogen bonds between base pairs in the DNA.
 - (b) They introduce nicks in the DNA
 - (c) They break the sugar-phosphate backbone of the DNA
 - (d) They introduce mutations in the DNA

9. What is the role of gene flow in population genetics?
- (a) It can lead to the fixation of alleles in a population
 - (b) It increases genetic diversity within populations.
 - (c) It prevents speciation from occurring
 - (d) It reduces genetic differentiation between populations
10. In vitro means
- (a) A scientific experiment performed inside the body in a clinical setting.
 - (b) A scientific experiment performed on animals in a controlled environment
 - (c) A scientific experiment performed on plants in a greenhouse
 - (d) A scientific experiment performed outside of the body in a laboratory setting

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) Quote the evolutionary theories of Darwin.
- Or
- (b) Visualize the role of Altruism in behavioral evolution.

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12. (a) Explain the role of gene in evolution.
Or
(b) Review on micro evolution.
13. (a) Explain about molecular phylogenetics and how it contributed to understanding of genetics and evolution?
Or
(b) Explain the Concept of distance methods in molecular phylogenetics and provide an example of how it can be used to reconstruct evolutionary relationships.
14. (a) Explain about nucleic acid sequence and how does it contribute to genetic information.
Or
(b) Conclude about restriction enzyme studies.
15. (a) Create a relationship to metapopulations in evolution.
Or
(b) Write about conservation methods of genetic resources.

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19. (a) Explain about the amino acid sequence analysis help in inferring phylogenetic relationships between organisms.
Or
(b) Illustrate about DNA hybridization techniques.
20. (a) Summarize about monitoring of natural populations.
Or
(b) Estimate about Loss of Genetic variations.
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PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 600 words.

16. (a) Define the evolutionary theories of Lamarck.
Or
(b) What are the key events and milestones in the evolution of the human lineage?
17. (a) Describe the process of Molecular evolution and its significance in the field of biology.
Or
(b) Explain some of the major trends observed in higher categories of organisms during their evolutionary history.
18. (a) Construct the method of Phylogenetic tree Which relates to evolution.
Or
(b) Illustrate about maximum likelihood method is used for phylogenetics.

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