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(FYUGP)

(6th Semester)

ENVIRONMENTAL SCIENCE

(MINOR)

Paper : EVS M-6T

(Organism and Evolutionary Biology)

Full Marks : 75

Pass Marks : 40%

Time : 3 hours

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

(PART : A—OBJECTIVE)

(Marks : 25)

SECTION—I

(Marks : 15)

Choose the correct option :

1×15=15

- 1.** Bryophytes are called the 'amphibians of the plant kingdom' because they
- (a) live only in water
 - (b) can survive in deserts
 - (c) require water for sexual reproduction
 - (d) have vascular tissues

2. The study of fossils to understand the history of life on earth is known as
 - (a) archaeology
 - (b) paleontology
 - (c) anthropology
 - (d) taxonomy
3. The first living organisms on earth were most likely
 - (a) multicellular eukaryotes
 - (b) aerobic organisms
 - (c) anaerobic prokaryotes
 - (d) photosynthetic algae
4. Lamarck's theory of evolution is based on the principle of
 - (a) natural selection
 - (b) survival of the fittest
 - (c) genetic drift
 - (d) inheritance of acquired characters
5. Mutation can be defined as
 - (a) gradual change in population
 - (b) sudden heritable change in DNA
 - (c) environmental adaptation
 - (d) crossing-over during meiosis

6. Which molecule is most commonly used in molecular phylogeny?
- (a) Lipid
 - (b) DNA sequence
 - (c) Hormone
 - (d) Carbohydrate
7. In Hardy-Weinberg equation, P^2 represents
- (a) dominant homozygous frequency
 - (b) allele frequency
 - (c) recessive genotype frequency
 - (d) heterozygous frequency
8. 'Survival of the fittest' refers to
- (a) physical strength
 - (b) longevity
 - (c) intelligence
 - (d) reproductive success
9. Gymnosperms are characterized by
- (a) seeds enclosed in fruits
 - (b) naked seeds
 - (c) absence of seeds
 - (d) presence of flowers

- 10.** Mendel's laws of inheritance are based on the experiments on
- (a) pea plants
 - (b) fruit flies
 - (c) maize plants
 - (d) bacteria
- 11.** Which of the following gases was absent in the primitive atmosphere?
- (a) Methane
 - (b) Ammonia
 - (c) Hydrogen
 - (d) Oxygen
- 12.** Speciation is the process of
- (a) formation of new populations
 - (b) formation of new species
 - (c) increase in genetic variation
 - (d) migration of organisms
- 13.** Molecular clocks are useful in estimating
- (a) population size
 - (b) age of fossils
 - (c) rate of reproduction
 - (d) time of evolutionary divergence

14. Continental drift theory helps to explain

- (a) molecular evolution
- (b) distribution of species
- (c) origin of life
- (d) neutral mutations

15. Peacocks tail is an example of

- (a) sexual selection
- (b) artificial selection
- (c) natural selection
- (d) genetic drift

SECTION—II

(Marks : 10)

Answer any *five* questions in brief :

2×5=10

1. Mention any two distinct features of phylum Porifera.
2. Write a note on anaerobic metabolism.
3. State the Oparin-Haldane hypothesis.
4. What is phylogeny? Name any one tool used in phylogenetic studies.
5. Write a note on sexual selection in evolution.

(6)

6. Differentiate between reptiles and amphibians.
7. Define unicellular and multicellular organisms.

(PART : B—DESCRIPTIVE)

(Marks : 50)

Answer any *five* of the following : 10×5=50

1. Describe the major group of plants focusing on their key characteristics with examples.
2. Explain in detail the prokaryotic cell with the help of a diagram.
3. Explain Lamarck's concept of evolution mentioning its principles and limitations.
4. Write a note on the Miller-Urey experiment and discuss its importance.
5. Discuss the application and limitations of molecular clocks.
6. Explain gene duplication and divergence with suitable examples. 5+5=10

7. Give a detailed account on convergent evolution.
8. Explain in detail the concept of population in ecology.
9. Explain in detail any five processes through which new genes and proteins arises.
10. Describe Darwin's theory of evolution.

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