Eduzen — Global Enrichment Programme

Biology | IGCSE | Grade 10 | Topic: Evolution and Biodiversity | **40 Marks** | 60 mins

Name: _____ Date: _____ Grade: **10**

A. Objective Questions — [8 × 1 = 8 Marks]

Choose the correct option.

1. Which of the following is NOT evidence for evolution?

a) Fossil record
b) Homologous structures
c) Acquired traits in Lamarckism
d) DNA similarities

Ans: [ ]

2. The finches of Galápagos Islands are an example of:

a) Convergent evolution
b) Adaptive radiation
c) Genetic drift
d) Artificial selection

Ans: [ ]

3. Which process causes random changes in allele frequencies, especially in small populations?

a) Natural selection
b) Mutation
c) Genetic drift
d) Gene flow

Ans: [ ]

4. Structures with same origin but different functions are called:

a) Analogous
b) Homologous
c) Vestigial
d) Fossils

Ans: [ ]

5. The modern definition of evolution is a change in:

a) Phenotype of individual
b) Allele frequency in population
c) Species over 1 generation
d) DNA of one organism

Ans: [ ]

6. Which scientist proposed the theory of inheritance of acquired characteristics?

a) Darwin
b) Wallace
c) Lamarck
d) Mendel

Ans: [ ]

7. Antibiotic resistance in bacteria develops mainly due to:

a) Mutation + Natural selection
b) Genetic drift
c) Artificial selection
d) Gene flow

Ans: [ ]

8. The wings of bats and birds are examples of:

a) Homologous structures
b) Analogous structures
c) Vestigial structures
d) Fossils

Ans: [ ]

B. Fill in the Blanks — [8 × 1 = 8 Marks]

Word Bank: speciation | variation | homologous | bottleneck | analogous | founder | punctuated | gradualism

1. Bat wings and insect wings are _____ structures.

2. The raw material for natural selection is _____ within a population.

3. A drastic reduction in population size leading to reduced genetic diversity is called a _____ effect.
4. The formation of new species is known as _____ .
5. The forelimbs of humans and whales are _____ structures.
6. When a small group colonizes a new area, the _____ effect occurs.
7. The theory that evolution occurs in rapid bursts followed by long stability is _____ equilibrium.
8. Darwin proposed that evolution occurs through _____ accumulation of small changes.

C. Descriptive Questions — [3 × 4 = 12 Marks]

Answer in 60–80 words each.

1. Describe Darwin's theory of natural selection using any one real-life example. **[4 marks]**

2. Explain how molecular biology / DNA evidence supports the theory of common ancestry. **[4 marks]**

3. Distinguish between allopatric and sympatric speciation with one example of each. **[4 marks]**

D. Application Based Questions — [2 × 6 = 12 Marks]

Case Study 1: The Peppered Moth

In 1848, 98% of peppered moths in Manchester were light-coloured. By 1895, 95% were dark-coloured due to industrial pollution darkening tree bark. After Clean Air Acts were introduced, light moths increased again significantly by 2003.

1. Identify the selection pressure acting on moths in 1895. **[1 mark]**

2. Explain why the dark moth population increased using natural selection. **[2 marks]**

3. Predict what would happen to moth populations if a new pollutant made tree bark bright orange. Justify your answer. **[3 marks]**

Case Study 2: Tuskless Elephants

African elephants are increasingly born tuskless. Before 1990, approximately 2–4% were naturally tuskless. In areas with heavy poaching, up to 33% of female elephants are now tuskless — a dramatic shift driven by human activity.

1. Identify the selection pressure causing this change. **[1 mark]**

2. Analyse how this is an example of human-induced evolution. **[2 marks]**

3. Evaluate one long-term ecological consequence if most elephants become tuskless. **[3 marks]**

Total: 40 Marks