gradeup

Get Ready to Crack CSIR-NET 2021

(Most Important Questions on Evolution)

www.gradeup.co

Sahi Prep Hai Toh Life Set Hai

Evolution

1. In the presence of predators, vervet monkeys warn other monkeys by emitting alarm calls, even though this activity can increase their chances of being attacked by the same predator. This behaviour of vervet monkeys can be explained as an example of

A. ltruism

B. Kin selection

C. Sexual selection

D. Social dominance

2. P and p are the two alleles that code for the petal colour of flowers. Their allelic frequencies are 0.6 and 0.4 respectively. From a population, 500 individuals are randomly sampled. Among these 500 individuals, how many are expected to be heterozygous?

A. 500

B. 120

C. 240

D. 480

3. Some of the members of the Florida scrub jay bird species called helpers to forgo their own reproduction to help other members of the group with breeding and nesting. What is this behaviour called?

A. Sexual selection

B. Kin selection

C. Diversifying selection

D. Natural selection

4. The birds of paradise are bird species found in New Guinea. The male birds of paradise have a colourful plumage. This is an example of

A. Natural selection

B. Sexual selection

C. Kin selection

D. Altruism

5. Galapagos finches, commonly called Darwin's finches are small land birds endemic to the Galapagos Islands. They are well known for the diversity of their beak forms. All the species are closely related to each other yet survive on different food sources. For which evolutionary process can Galapagos finches be cited as an example?

A. Convergent evolution

B. Parallel evolution

C. Neutral evolution

D. Divergent evolution

6. Genetic relatedness is a measure of consanguinity. It is the probability that an allele present in one individual is also present in another individual. The degree of genetic relatedness between siblings is

A. same as the genetic relatedness between parents and siblings

B. higher than that between parents and sibling

C. lower than that between parents and sibling

D. depends on the number of siblings

7. Which evolutionary theory suggests that mutations and genetic drift are responsible for most of the genetic variation in populations?

A. Neutral theory

B. Selections theory

C. Quantitative theory

D. Modern evolutionary theory

8. The following geological events happened during various periods of the Palaeozoic era.

P) Origin of fungi

Q) Age of fishes

R) Largest mass extinction

S) First appearance of trilobites

Identify the correct match of the events with the periods

A. Devonian period-(R),Cambrian period-(S), Ordovician period-(Q), Silurian period-(P)

B. Cambrian period-(S), Devonian period-(Q), Silurian period-(R), Ordovician period-(P)

C. Permian period-(Q), Silurian period-(R), Ordovician period-(P), Devonian period-(S)

D. Ordovician period-(P), Silurian period-(S), Devonian period-(R), Permian period-(Q)

9. Apple maggot flies used to lay their eggs on hawthorn fruit. However, over a period of time, some apple maggot flies have evolved to lay their eggs on apples. Now there are 2 species of apple maggot flies. Which type of speciation do the apple maggot flies represent?

A. Allopatric speciation

B. Sympatric speciation

C. Parapatric speciation

D. Peripatric speciation

10. Match the following geological events with the periods they occurred in

Events	Periods
A) Latest ice age	1) Triassic period
B) Appearance of ancestral elephants	2) Pleistocene period
C) First appearance of angiosperms	3) Oligocene period
D) Appearance of ancestral birds	4) Cretaceous period
E) First appearance of mammals	5) Jurassic period

A. A-5, B-3, C-2, D-1, E-4

B. A-2, B-3, C-4, D-5, E-1

C. A-4, B-2, C-3, D-4, E-1

D. A-5, B-1, C-4, D-3, E-2

Answer:

1. A
2. C
3. B
4. B
5. D
6. A
7. A
8. B
9. B
10. B

Solutions

Solution 1. In behavioural biology, altruism is defined as the act of helping other humans or animals at one's expense. In layman's terms, it can be described as "the act of selflessness". Altruism is a type of social behaviour. In this question, vervet monkeys alert other members of the group even though doing so puts its life in danger.

Solution 2. Hardy-Weinberg equilibrium states that "In a large panmictic population, the gene frequencies remain constant from generation to generation irrespective of changes in the genotype frequencies, if the population doesn't experience mutation, migration (immigration/emigration), genetic drift or natural selection". The Hardy-Weinberg equilibrium formulae are p+q = 1 and p2+2pq+q2 = 1. Where, · p represents the dominant allele · q represents the recessive allele · 2pq represents the heterozygote Since we know the values of p and q, we can substitute them in the formula p2+2pq+q2to Find the frequency of heterozygotes. So, Heterozygote frequency (2pq) = 2*0.6*0.4 = 0.48

Now multiplying 0.48 with the number of individuals i.e. 0.48*500 will give the number of heterozygous individuals

Therefore, 0.48*500 = 240 is the number of heterozygous individuals in the given sample population.

Solution 3. Kin selection is a type of social behaviour where an individual engages in self-sacrificial practices so that relatives benefit the genetic fitness. So, in this question, the Florida scrub-jays sacrifice their own reproduction to help their relatives reproduce. They, therefore, represent an example of Kin selection.

Solution 4. Sexual selection is the process by which members of one sex choose members of the opposite sex to mate with. Sexual selection can be greatly seen in birds. Females choose their male counterparts on the basis of their colourful plumage, extravagant body parts, courtship dances etc. So, the colourful plumage of the male birds of paradise is an example of sexual selection.

Solution 5. Divergent evolution is a form of evolution where members of closely related species accumulate differences and over a period of time, these differences lead to speciation. Divergent evolution and adaptive radiation are often related to each other. For example, the Galapagos islands finches developed different beak

structures in order to eat a wide variety of foods ranging from fruits to nuts. This is adaptive radiation. As years progressed, these differences in their beak structures led to speciation and now there are around 18 different species.

Solution 6. Genetic relatedness is the percentage of similar genes shared between 2 individuals. The genetic relatedness of parents and offspring is ½ since the offspring ½ genes from the mother and ½ genes from the father. The genetic relatedness between siblings is also ½ because each sibling will get ½ their genes from mother and ½ their genes from father. So ½ will be the genetic relatedness between siblings.

Solution 7. Neutral theory is an evolutionary theory that holds mutations and genetic drifts responsible for the genetic variations observed in populations.

Solution 8. The Cambrian period can be called as the age of trilobites. It lasted from 541 mya (million years ago) to 485.4 mya. The Devonian period is known as the age of fishes since there was a rapid diversification of fishes during this time. It lasted from 419.2 mya to 358.9 mya. The Silurian period saw one of the worst mass extinctions of the history of the earth. It eliminated 85% of all species. It lasted from 443.8 mya to 419.2 mya. Fungi originated in the Ordovician period which lasted from 488.3 mya to 443.7 mya.

Solution 9. Sympatric speciation is the process of evolution where different species that share the same habitat become reproductively isolated. So, in the case of apple maggot flies, their ancestors were capable of laying eggs only on hawthorn fruit. But due to sympatric speciation, new species have evolved that lays their eggs on apples.

Solution 10. Pleistocene period: Occurred from 2.58 mya to 0.012 mya. This period is referred to as "The Ice Age" since the most recent episodes of global cooling and glaciation took place in this period. This was also the period when humans evolved rapidly. The woolly mammoth is an animal characteristic of this period. The woolly mammoth went extinct after the ice age and humans evolved to be the most dominant animal on earth.

• Oligocene period: Occurred from 35 mya to 28 mya. Early ancestral elephants appeared for the first time during this period. This period also witnessed the rapid diversification and evolution of mammals, modern flowering plants and ungulates.

• Cretaceous period: Occurred from 144 mya to 66.4 mya. This is an important period in the geological time scale. First angiosperms appeared in this period.

● The last of the dinosaurs also went extinct during this period. The modern sharks also appeared in this period. The Rocky Mountains arose in this period.

● Jurassic period: The Jurassic period is the most famous period in the geological time scale. It occurred between 208 mya to 44 mya. Dinosaurs dominated the earth during this period. Birds, frogs and lizards first appeared during this period. The rapid growth of gymnosperms was also observed in this period.

● Triassic period: This is the first period of the Mesozoic era and it occurred between 245 mya to 208 mya. First mammals, crocodiles, modern conifers and modern corals appeared in this period. A reduction in marine invertebrates was also observed during this period.

gradeup

Gradeup CSIR-NET
Super Subscription

Features:

1. Memory Based Test Series of the actual exam paper.
2. All the CSIR NET Test Series based on the latest pattern and the trend that is followed.
3. Detailed performance analysis based on All India Rank after the completion of the test.
4. Mock Test are available in Hindi & English
5. Available on Mobile and Desktop

Gradeup Super Subscription, Enroll Now

www.gradeup.co

Sahi Prep Hai Toh Life Set Hai