CBSE Important Questions for Class 10 Science Chapter 9: CBSE Important Questions for Class 10 Science Chapter 9 Heredity and Evolution explores the principles of inheritance, variation, and evolutionary processes. Important questions focus on key concepts like Mendel's laws of inheritance, traits, dominant and recessive genes, sex determination, and how genetic variations lead to evolution.

Students should understand examples of acquired and inherited traits, the role of DNA in heredity, and the connection between heredity and evolution. Questions also emphasize topics like speciation, natural selection, and fossils as evidence of evolution. These questions are designed to strengthen students' understanding of genetics and evolutionary theory, preparing them for exams.

CBSE Important Questions for Class 10 Science Chapter 9 Overview

CBSE Important Questions for Class 10 Science Chapter 9 Heredity and Evolution is essential for students as it lays the foundation for understanding genetics and the evolutionary process. The chapter introduces Mendel's laws of inheritance, explaining how traits are passed from one generation to another through genes, and clarifies the concepts of dominant and recessive traits, sex determination, and variation. Understanding these concepts helps students grasp the role of DNA in heredity and genetic diversity, which is crucial for fields like biology, medicine, and biotechnology.

The chapter also connects heredity with evolution, explaining processes like natural selection, speciation, and fossil evidence, which are key to understanding the origin and development of species. Studying this chapter prepares students for higher-level biology and makes them aware of the importance of genetics and evolution in real-life applications.

CBSE Important Questions for Class 10 Science Chapter 9 Heredity and Evolution

Below is the CBSE Important Questions for Class 10 Science Chapter 9 Heredity and Evolution -

MCQ's

Question 1. The exchange of genetic material takes place in

(a) budding

(b) asexual reproduction

(c) sexual reproduction

(d) vegetative reproduction

Answer 1: (c)

Explanation:

Other options include forms of asexual reproduction involving only one parent, in addition to sexual reproduction. As a result, the sexual form of reproduction involves the exchange of genetic material.

Question 2. A crossing between the tall plant (TT) and the short pea plant (tt) resulted in a progeny that was all tall plants because

(a) tallness is the dominant trait

(b) height of the pea plant is not governed by the gene 'T' or 't'

(c) tallness is the recessive trait

(d) shortness is the dominant trait

Answer 2: (a)

Explanation:

In a monohybrid cross, only dominant characters are expressed in the first progeny**.**

Question 3. Which of the following statements is incorrect?

(a) For the production of every enzyme, there is a gene.

(b) For every protein, there is a gene.

(c) For every hormone, there is a gene.

(d) For every molecule of a fat, there is a gene

Answer 3: (d)

Explanation: There is a specific gene for each protein, enzyme, and hormone, but there is no gene for fats.

Question 4. If the round, green-seeded pea plant (RR yy) is crossed with any wrinkled, yellow-seeded pea plant (rr YY), then the seeds thus produced in the next F1 generation are

(a) round and yellow

(b) wrinkled and yellow

(c) wrinkled and green

(d) round and green

Answer 4: (a)

Explanation: Since round and yellow are the dominant characteristics, all seeds from the first generation will have these characteristics.

Question 5. The maleness of a child is determined by

(a) sex is determined by chance

(b) the Y chromosome in the zygote

(c) the X chromosome in the zygote

(d) the cytoplasm of the germ cell, which determines the sex

Answer 5: (b)

Explanation:

If sperm carrying a copy of the Y chromosome fertilises the egg, the zygote will develop into a male progeny. Should sperm with X chromosomes fertilise the egg, the zygote will develop into a female progeny.

Question 6. A basket full of vegetables that contains carrot, radish, potato, and tomato. Which of these represents the correct homologous structures?

(a) Radish and Potato

(b) Carrot and tomato

(c) Radish and carrot

(d) Carrot and potato

Answer 6: (c)

Explanation: Both the radish and carrot have a similar structure, and they both grow beneath the earth (roots).

Question 7. Select the correct statement.

(a) Tendril of any pea plant and the phylloclade of Opuntia are homologous

(b) Tendril of any pea plant and the phylloclade of Opuntia are analogous

(c) Wings of the birds and wings of the bats are homologous

(d) Wings of birds and limbs of lizards are analogous

Answer 7: (a)

Explanation: Due to their comparable origins and patterns, the phylloclade of Opuntia and the tendril of the pea plant are homologous.

Short Answer Type Questions

Question 1. Will the geographical isolation be the major factor in the speciation of an organism that reproduces asexually? Why or why not?

Answer: Geographic isolation cannot be taken into account in the case of asexually reproducing organisms. Meiosis does not take place during asexual means of reproduction, which accounts for this.

Question 2: Why do mice whose tails were surgically removed just after birth for generations continue to produce mice with tails?

Answer: A group of mice will usually breed, and each mouse will have a tail when it comes to progeny. Now, if their tails are surgically removed after every generation, these mice will not have offspring without a tail.

This is true because a mouse's ability to remove its tail at any point in its life cycle is an acquired characteristic that is not inherited by the following generation. The removal of the tail has no effect on the genes in the germ cells of the mice.

Question 3. How is the sex of the child determined in human beings?

Answer: In humans, the sex of the newborn is determined by the men. Males have XY chromosomes, whereas females have XX chromosomes. Consequently, if the mother gives birth to a girl at the time of the male and female X chromosomes joining. When the X chromosome of the female and the male merge, a boy is born as a result.

Question 4. Why are the traits acquired during the lifetime of an individual individual and not inherited?

Answer: Traits acquired over a lifetime cannot be handed on to subsequent generations since changes do not reflect in the DNA of the germ cells. For example, a football player cannot pass on his talents to his offspring since non-reproductive cells are the only ones that may inherit them.

Question 5. Why are the small numbers of surviving tigers a cause of worry from the point of view of genetics?

Answer: The genetic diversity of the species falls together with the size of the tiger population. As a result, the genetic variations that can be added to tiger populations are restricted. This diversity deficit will have far-reaching consequences. For example, if a sickness breaks out in the tiger population, it has the potential to wipe out the entire species and bring about their extinction.

Long Answer Type Questions

Question 1: Define evolution. How does it occur? Describe how the fossils provide us with evidence in support of evolution.

Answer: Evolution is the progressive change from simple to sophisticated life forms, or from extinct organisms that existed millions of years ago to modern species. During evolution, simple life forms experience enhancements, modifications, and shifts. The remains or imprints of organisms that existed in the distant past are known as fossils. Fossils provide evidence that the animal we know today is descended from ancient species through continuous evolution. Fossils can be used to track the evolutionary history of an organism. According to the pattern of fossil distribution, the most recent fossils found in the upper layers have undergone greater evolutionary change than the older fossils found in the lower rocks.

This suggests that fossils appear and becoming more complex as we proceed from the earliest to the most recent rocks. It gives us a broad overview of the historical epoch that saw the emergence or extinction of particular species. Fossils therefore provide evidence for the validity of evolution.

Question 2: Explain how the evolutionary relationships can be easily traced by the study of the homologous organs.

Answer: Homologous organs offer morphological and anatomical evidence for evolution. Many animal or plant species have different organs that have different functions but the same basic structure.

These are what we call homologous organs. For example, the forelimbs of frogs, reptiles, birds, and humans all share the same basic form. The basic similarity between the forelimbs of these different species indicates that they all shared a common ancestor with five pentadactyle digits, which were subsequently adjusted during evolution to meet the specific needs of subsequent generations. Therefore, homologous organs show adaptive radiation or divergent evolution.

Question 3: Distinguish between homologous and analogous organs. In which category would you place the wings of a bird and the wings of a bat? Justify your answer by giving a suitable reason.

Answer: Organs that have different functions, but the same basic structure and embryonic origin are said to be homologous.

Although these organs have the same basic organisational structure during development, as adults, they have undergone changes to enable them to carry out different functions in order to adapt to different circumstances. Organs that carry out similar functions but have distinct basic structures and developmental histories are considered analogous.

Although the fundamental structure or architecture of a bat's and bird's wings differ, they are analogous organs because they have the same function in flight.

Question 4: “Evolution and classification of organisms are interlinked”. Give reasons to justify this statement.

Answer: Different types of species evolve from already existing ones through the process of evolution. Classification is the division of organisms into several groups according to physiological, biological, anatomical, or other connections. Every classification system adheres to a hierarchy. Two species are more closely related the more recently they shared an ancestor. Sorting organisms into many groups according to common and distinctive characteristics is an essential part of classification.

It facilitates comprehension of the basic arrangement of a hierarchical organisation including numerous species. It makes it simple to conduct studies or research on a wide variety of related organisms. Therefore, we might argue that there is a relationship between evolution and classification, and that the way species are categorised truly reflects their evolutionary history.

Benefits of CBSE Important Questions for Class 10 Science Chapter 9

The CBSE Important Questions for Class 10 Science Chapter 9, "Heredity and Evolution," offer several key benefits to students:

Focused Revision: These questions target the most crucial topics, helping students revise efficiently and focus on essential concepts like Mendel’s laws, traits, DNA, and evolution.

Exam Preparation: The questions are based on the CBSE exam pattern, giving students a clear idea of what to expect in exams and helping them practice answering questions accurately.

Conceptual Clarity: By covering important aspects of heredity, genetic variations, and evolution, these questions ensure a deep understanding of the chapter, helping students master key topics.

Practice Problem-Solving: Working through these questions enhances analytical and problem-solving skills, which are essential for answering application-based questions.

Boosts Confidence: Familiarity with important questions boosts students' confidence, reducing exam anxiety and improving their performance.

Time Management: Practicing these questions helps students learn how to manage their time effectively during exams.