

Class 10 Heredity and Evolution CBSE Solved Test paper-2

1. Who proposed the theory of inheritance of acquired characters.

Answer: J.B. Lamarck.

2. State one of the evolutionary forces leading to the origin of a new species according to the synthetic theory of evolution.

Answer: Origin of new species is based on natural selection acting on genetic variations that appear among the members of a population.

3. Give an example of a vestigial organ present in human body.

Answer: Vermiform appendix.

4. What is the evolutionary significance of the fossil Archaeopteryx?

Answer: Archaeopteryx is the connecting link between reptiles and birds. It has both reptilian on features and avian (bird-like) features.

5. Who proposed the double helical model of DNA?

Answer: Watson and Crick.

6. Who proposed the theory of natural selection?

Answer: Charles Darwin.

7. What is retro virus?

Answer: A virus with RNA as the genetic material eg: HIV is a retro virus.

8. What is a genetically modified organism (GMO)?

Answer: The organism that contains a segment of foreign DNA.

9. Name any two genetic diseases.

Answer: Hemophilia and colour blindness.

10. One of the examples of two analogous organs can be the wing of parrot and

a) Flippers of whale. c) Foreleg of horse b) Front leg of frog d) Wing of housefly

Answer: Wing of housefly

SHORT ANSWER QUESTIONS (2 marks)

1. What are transgenic organisms? Which property of DNA is used as a tool in genetic engineering?

Answer: The organisms that contain a segment of foreign DNA are known as transgenic organisms. The complimentary property of the nucleotides of DNA. is the most powerful tool in genetic engineering.

2. Explain how the sex of the child is determined at the time of conception in human beings.

Answer: Male human beings have XY sex-chromosomes and female human beings have XX sex-

chromosomes. If a sperm carrying x-chromosome fertilizes with the ovum, then sex of the baby will be female. If a sperm carrying y-chromosome fuses with the ovum, the sex of the baby will be male.

3. By comparing the similarity of nucleotide sequences in DNA of different kinds of organisms, evolutionary relationships can be established.

a) Arrange the following according to their evolutionary closeness (You may use your knowledge of classification also) Cockroach, mango tree, gorilla, fish.

b) Whose DNA among the following do you think is most similar to that of humans.

Answer: (a) cockroach – fish – gorilla (b) Gorilla

4. Mention the ways by which variant genotypes are produced in organism?

Answer: a) gene mutation b) Crossing over c) Hybridization

5. In human beings blue eye colour is recessive to brown eye colour . If a brown eyed man has a blue eyed mother then find

a) What are the possible genotypes of his father?

b) What is the genotype of the man and his mother?

Answer: BB , Bb B. Man: Bb, mother: bb

6. What are fossils? Of what interest are fossils to the evolutionary biologists?

Answer: A fossil is the remnant or impression of an organism that lived in the Remote past.

Use of Fossils

a) Phylogeny, the evolutionary history can be reconstructed from the fossils.

b) The fossil record has helped in building the broad historical sequence of biological evolution.

SHORT ANSWER QUESTION (3 marks)

1. (a) Who isolated DNA for the first time from pus cells? (b) Why is DNA called polynucleotide?

(c) Name two purine nitrogenous bases found in a DNA molecule.

Answer:

(a) F.Meishcer, named it nuclein.

(b) DNA is called polynucleolide because it is a polymer or long chain of nucleolide.

(c) Purine:- Adenine and Guanine.

2. (a) Who put forward the double helical model of DNA?

(b) What are the three chemically essential parts of nucleotides constituting a DNA?

Answer: (a) Watson and Crick.

(b) Nucleotide constituting – DNA Nitrogen bases (Purines and Pyrimidines) , Pentose sugar (Deoxyribose sugar) and a phosphate molecule.

3. Guinea pig having black colour when crossed with guinea pig having same colour produced 80 offspring, out of which 60 were black and 20 were white. Now, find out:

(a) What is the possible genotype of the guinea pigs?

(b) Which trait is dominant and which trait is recessive?

(c) What is this cross called as and what is its phenotypic ratio?

Answer:

(a) Bb x Bb

(b) Black is dominant and white is recessive.

(c) Monohybrid cross, phenotypic ratio=3:1

4. Write a brief account on. Who disproved this theory?

Answer: salient points of Lamarck's theory:

1. The use and disuse of an organ leads to acquiring of change in the features of that organ.

2. These changes are inherited by the offspring.

3. Favourable variations result in evolution of new species.

August Weisman disproved this theory.

5. Distinguish between acquired and inherited traits giving one example of each.

Answer: Acquired traits

1) A trait (or characteristic) of an organism which is not inherited but develops in response to the environment is called an acquired trait.

(2) The acquired traits of an organism cannot be passed on to its future generations. e.g. low weight of beetle, cut tail of a mouse.

Inherited traits

1) A trait (or characteristic) of an organism which is caused by a change in its genes (or DNA) is called an inherited trait.

2) The inherited traits of an organism are passed on to its future generations. e.g. red colour of beetles, fur coat of guinea pigs.

6. Why did Mendel choose pea plant for his experiments? T-II 2015

Answer: Mendel chose pea plant for his experiments because it is:

(a) Easy to grow

(b) Short lifespan

(c) Easily distinguishable characters

(d) larger size of flower (e) Self-pollinated.