CBSE Test Paper-04

Chapter 09 Heredity and Evolution

1. Who proved the evidence of DNA as a genetic Material? **(1)**
   a. Gregor Mendel
   b. Frederick meisner
   c. Weismann
   d. Lamarck
2. Who is called the father of genetics? **(1)**
   a. Stanley and miller
   b. Gregor Mendel
   c. Lamarck
   d. Darwin
3. A cross between hybrid and a parent is known as **(1)**
   a. Back cross
   b. Test cross
   c. Monohybrid cross
   d. Reciprocal cross
4. Match the following with correct response. **(1)**

(1) Group of tissues working together	(A) Homologous organs
(2) Organs structurally similar functionally different	(B) Vestigial organs
(3) Organs functionally similar but develop from different ways	(C) Analogous organs
(4) Functionless organs present in body	(D) Organs

   a. 1-D, 2-A, 3-C, 4-B
   b. 1-B, 2-D, 3-A, 4-C
   c. 1-C, 2-B, 3-D, 4-A
   d. 1-A, 2-C, 3-B, 4-D
5. Which of these is an example of homologous organs? **(1)**

a. Potato and runners of grass
b. All of these
c. Our arm and a dog's fore-leg.
d. Our teeth and an elephant's tusks

6. Mention the compliment of a sperm and the egg which will determine the birth of female child. **(1)**

7. Write the expanded form of DNA. **(1)**

8. In a beetle population, the number of green beetles is more than blue and red beetles. Give a reason behind this situation. **(1)**

9. Human have evolved from chimpanzee. Is it true? **(1)**

10. Why acquired characters are not inherited? **(3)**

11. Does genetic combination of mothers play a significant role in determining the sex of a newborn? **(3)**

12. Why crows could not eat coloured beetles? **(3)**

13. Enumerate the functions of chromosomes. **(3)**

14. Outline a project which aims to find a dominant coat colour in dogs. **(5)**

15. How is the sex of child determined in human beings. **(5)**

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Answers

1. b. Frederick meisner

   Explanation: In 1869, Johann Friedrich Miesner, a young Swiss medical student, discovered an acidic substance that he isolated from pus cells obtained from bandages used to dress humans. He found it in the form of a mixture of compounds in the nucleus of the cell and named it “Nuclein”. The nature of Nuclein was unusual as it contained large amounts of both nitrogen and phosphorous and at that time these two elements were known to coexist only in certain types of fats.

   Even though the discovery of Nuclein by Meischer took quite early but the discovery of DNA as genetic material took very long to be discovered and proven

2. b. Gregor Mendel

   Explanation: Gregor Mendel is called the father of genetics because he was the first person in the world to observe the fact that characteristics were passed on from the parents to the children.

3. a. Back cross

   Explanation: Backcrossing is a crossing of a hybrid with one of its parents or an individual genetically similar to its parent, in order to achieve offspring with a genetic identity which is closer to that of the parent. It is used in horticulture, animal breeding and in production of gene knockout organisms.

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

   Explanation:

   a. Cells functioning together form tissue and tissue in turn form organs.
   b. organs with same origin but different function- homologous organs. e.g. limbs of bat and human.
   c. organs with different origin but same function- analogous organs.e. g. Wings of butterfly and birds.

d. appendix is non functional part in human body.

5. b. All of these

   Explanation: All of these are the example of homologous organs. All of them corresponds in structure and in origin, but not necessarily in function.

6. For girl child, sperm has X chromosome and egg also has X chromosome.

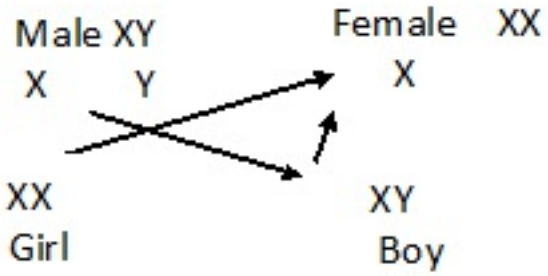
7. Deoxyribonucleic acid.

8. It is because of natural selection. As green beetles can't easily be picked as they blend better with the environment around them.

9. No, the two species have evolved in separate ways from a common ancestor.

10. Acquired traits are those characters which are acquired in the organisms during lifetimee time. They are not inherited to next generations. These traits are because of non-reproductive tissues and they cause no change in the DNA of the organisms.

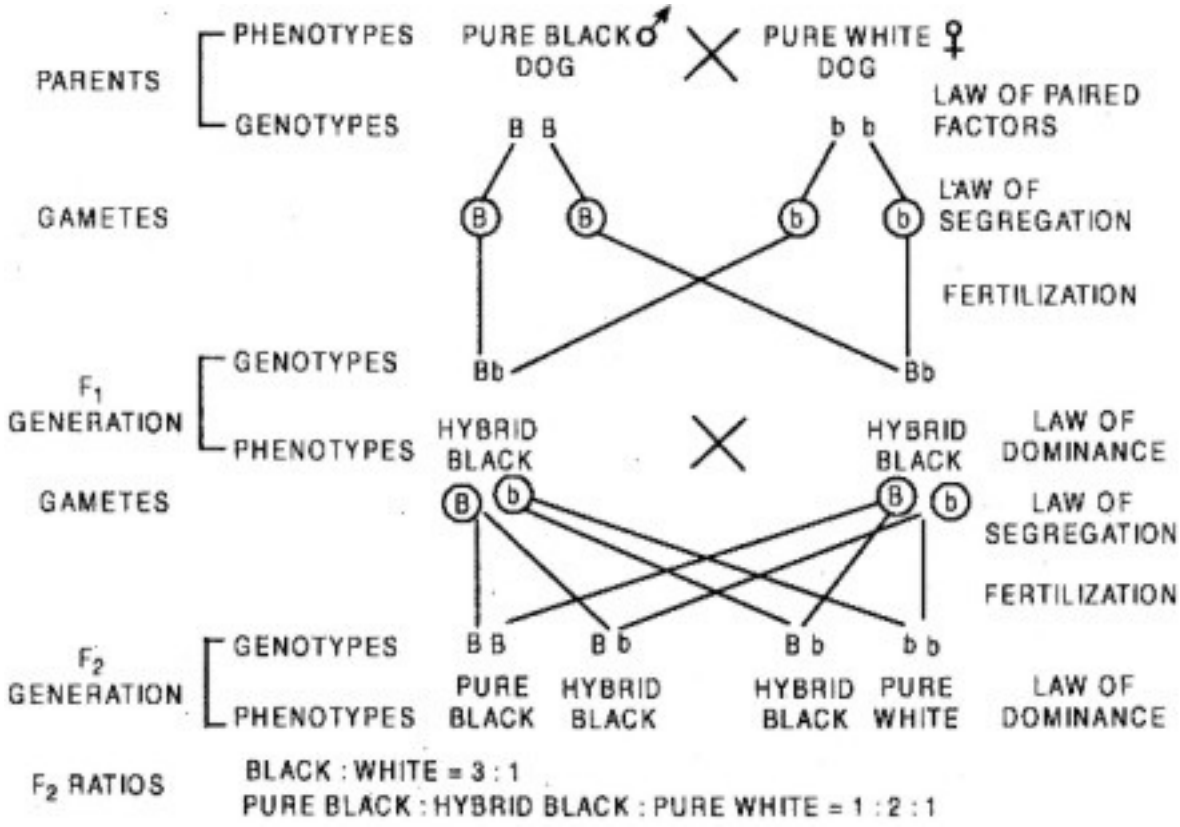
11. No, mother have no role in determining the sex of a new born. As female have only a pair of X chromosome all children wiil inherit only one X chromosome from the mother. As males have X and Y chromosome its the father, who determines the sex of a new born.



12. Crows could not see green coloured beetles as they matched with green leaves and bushes. So, crows could not eat coloured beetles.

13. Functions of chromosomes are,
    1. Chromosomes are thread-like organized structures located inside the nucleus of both animal and plant cells. Each chromosome is made of the combination of proteins and DNA.

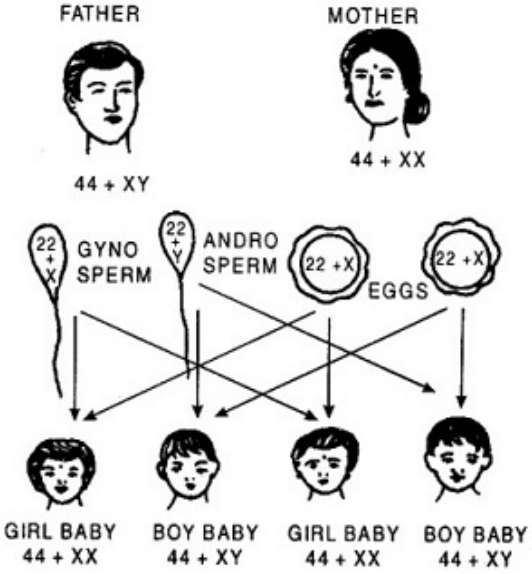
2. Chromosomes basically control all the activities of a living cell. DNA present on the chromosome not only carries most of the genetic information but also controls the hereditary transference.
3. Chromosomes are essential for the process of cell division, are responsible for replication, division, and creation of daughter cells which contain correct sequences of DNA and proteins.
4. Chromosomes are often called as the 'packaging material', because it tightly holds the DNA and proteins together in the eukaryotic cells.

14. 

A chart showing the monohybridd cross.

15. Determination of the sex of child. Sex chromosomes determine sex in human beings. In males, there are 44 + XY chromosomes, whereas, in female there are 44 + XX chromosomes. Here X and Y chromosomes determine sex in human beings.
Two types of gametes are formed in male, one type is having 50%, X-chromosome, whereas, other type is having Y-chromosome. In female, gametes are of one type and contain X-chromosome.
The females are homogametic. If male gamete having Y-chromosome (endosperm) undergoes fusion with female gamete having X-chromosome the zygote will have X Y

chromosomes and this gives rise to male child.



If male gamete having X-chromosome undergoes fusion with female gamete having X-chromosome, the zygote will be having XX-chromosome and this gives rise to female child.