



# BIOLOGY

**BOOKS - VK GLOBAL PUBLICATION**

**BIOLOGY (HINGLISH)**

**HEREDITY AND EVOLUTION**

## Ncert Intext Questions

1. If a trait A exists in 10% of a population of an asexually reproducing species and a trait B

exists in 60% of the same population, which trait is likely to have arisen earlier?



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2. How does the creation of variations in a species promote survival?



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3. How do Mendel's experiments show that traits may be dominant or recessive?



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4. How do Mendel's experiments show that traits are inherited independently?



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5. A man with blood group A marries a woman with blood group O and their daughter has blood group O. Is this information enough to

tell you which of the traits blood group A or O is dominant? Why or why not?



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6. What are the different ways in which individuals with a particular trait may increase in a population?



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



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8. Why are traits acquired during the lifetime of an individual not inherited?



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



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**10.** What factors could lead to the rise of a new species?



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11. Will geographical isolation be a major factor in the speciation of a self-pollinating plant species? Why or why not?



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



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**13.** Give an example of characteristics being used to determine how close two species are in evolutionary terms.



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**14.** Can the wing of butterfly and the wing of a bat be considered homologous organs? Why or why not?



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**15.** What are fossils? What do they tell us about the process of evolution?



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**16.** Why are human beings who look so different from each other in terms of size, colour and looks said to belong to the same species?



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**17.** In evolutionary terms, can we say which among bacteria, spiders, fish and chimpanzees have a 'better' body design? Why or why not?



**View Text Solution**

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## Ncert Exercises

1. A Mendelian experiment consisted of breeding tall pea plants bearing violet flowers with short pea plants bearing white flowers. The progeny all bore violet flowers, but almost half of them were short. This suggest that the genetic make-up of the tall parent can be depicted as

A. TTWW

B. Ttww

C. TtWW

D. TtWw

**Answer: c**



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2. An example of homologous organs is

A. our arm and dog's fore-leg

B. ur teeth and an elephant's tusks

C. potato and runners of grass

D. all of the above

**Answer: d**



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**3.** In evolutionary terms, we have more in common with

A. a Chinese school-boy

B. a chimpanzee

C. a spider

D. a bacterium

**Answer: a**



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4. A study found that children with light-coloured eyes are likely to have parents with light-coloured eyes. On this basis, can we say anything about whether the light eye colour

trait is dominant or recessive? Why or why not?



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5. How are the areas of study-evolution and classification interlinked?



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6. Explain the terms analogous and homologous organs with examples.



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7. Outline a project which aims to find the dominant coat colour in dogs.



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8. Explain the importance of fossils in deciding evolutionary relationship.



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9. What evidence do we have for the origin of life from inanimate matter?

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10. Explain how sexual reproduction gives rise to more viable variations than asexual reproduction. How does this affect the evolution of those organisms that reproduce sexually?

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**11.** How is the equal genetic contribution of male and female parents ensured in the progeny?



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**12.** Only variations that confer an advantage to an individual organism will survive in a population. Do you agree with this statement? Why or why not?



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## Very Short Answer Questions

1. What is meant by characteristics ?



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2. Who is known as the father of genetics?



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**3. Define chromosome.**



**View Text Solution**

**4. Define variation.**



**View Text Solution**

**5. Define a gene.**



**View Text Solution**

6. Define alleles.



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7. Write the expanded form of DNA.



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8. Where is DNA found in a cell?



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9. What is the function of a gene?



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10. Who proposed the theory of natural selection?



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11. Which of the following traits are recessive in pea plant?

Dwarfness, violet flower, wrinkled seed.



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**12.** How many pairs of chromosomes are found in human beings?



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**13.** In humans, the gene for black hair colour is B and gene for brown hair colour is b. What will be the hair colour of person having the

genetic constitution?

(a) BB (b) bb (c) Bb



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14. Write the names of two types of chromosomes found in an organism.



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15. How many chromosomes are present in a sperm and an ovum?





[View Text Solution](#)

**16.** What is a sex chromosome?



[View Text Solution](#)

**17.** A woman has only daughters, analyse the situation genetically and provide a suitable explanation.



[View Text Solution](#)

**18.** Which sex chromosomes are found in male and female human beings?

 [View Text Solution](#)

**19.** Who gave the theory of inheritance of acquired characters ?

 [View Text Solution](#)

**20.** Define mutation.





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21. What are fossils?



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22. What is the significance of Archaeopteryx in evolution?



[View Text Solution](#)

23. Why are acquired characters not inheritable?

 [View Text Solution](#)

24. What is genetic drift?

 [View Text Solution](#)

25. How do we know how old a fossil is?

 [View Text Solution](#)

**26.** What is organic evolution?



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## Short Answer Questions I

1. Why offsprings differ from parents in certain characters?



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2. What are the causes of variations?



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3. Give the pair of contrasting traits of the following characters in pea plant and mention which is dominant and recessive

(i) yellow seed

(ii) round seed



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4. What is the contribution of Mendel to genetics?



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5. Do genetic combination of mothers play a significant role in determining the sex of a new born?



[View Text Solution](#)

6. How does use and disuse of an organ help in evolution of a new species?



[View Text Solution](#)

7. A very small population of a species faces a greater threat of extinction than a larger population, Provide a suitable genetic explanation.



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8. Does the occurrence of diversity of animals on earth suggest their diverse ancestry also?

Discuss this point in the light of evolution.



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9. All the human races like Africans, Asians, Europeans, Americans and others might have evolved from a common ancestor. Provide a few evidences in support of this view.



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**10.** A change in DNA that is useful for one property to start with, can become useful later for a different function. Explain.



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**11.** List two differences in tabular form between dominant trait and recessive traits. What percentage/proportion of the plants in the  $F_2$  generation/progeny were round, in

Mendel's cross between round and wrinkled pea plants?



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12. How many pairs of chromosomes are present in human beings? Out of these how many are sex chromosomes? How many types of sex chromosomes are found in human beings?



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## Short Answer Questions li

1. What is DNA copying? State its importance.



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2. "We cannot pass on to our progeny the experiences and qualifications earned during our life time". Justify the statement giving reason and examples.



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3. 'Different species use different strategies to determine sex of a newborn individual. It can be environmental cues or genetically

determined'. Explain the statement by giving example for each strategy.



[View Text Solution](#)

4. How do variations occur in an offspring?



[View Text Solution](#)

5. Why is variation beneficial to the species but not necessary for the individual?



[View Text Solution](#)

6. What is speciation List four factors responsible for speciation.



[View Text Solution](#)

7. List in tabular form, two distinguishing features between the acquired traits and the inherited traits with one example of each.



[View Text Solution](#)



8. List three distinguishing features, in tabular form, between acquired traits and the inherited traits.



[View Text Solution](#)

9. In one of his experiments with pea plants Mendel observed that when a pure tall pea plant is crossed with a pure dwarf pea plant, in the first generation,  $F_1$  only tall plants appear.

(a) What happens to the traits of the dwarf plants in this case?

(b) When the  $F_1$  generation plants were self-fertilised, he observed that in the plants of second generation,  $F_2$  both tall plants and dwarf plants were present. Why it happened? Explain briefly.



[View Text Solution](#)

10. What are chromosomes? Explain how in sexually reproducing organisms the number of chromosomes in the progeny is maintained.



[View Text Solution](#)

11. "Two areas of study namely 'evolution and classification are interlinked.'" Justify this statement.



[View Text Solution](#)

12. A pea plant with blue colour flower denoted by BB is cross-bred with a pea plant with white flower denoted by ww.

(a) What is the expected colour of the flowers in their  $F_1$  progeny?

(b) What will be the percentage of plants bearing white flower in  $F_2$  generation, when the flowers  $F_1$  plants were selfed?

(c) State the expected ratio of the genotype BB and Bw in the  $F_2$  progeny.



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**13.** Explain the following:

(a) Speciation (b) Natural Selection



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**14.** "Fossils are related to evolution", justify this statement. Give the two ways by which age of the fossils can be estimated?



**View Text Solution**

**15.** (i) Planaria, insects, octopus and vertebrates all have eyes. Can we group eyes of these animals together to establish a common evolutionary origin? Justify your answer.

(ii) "Birds have evolved from reptiles". State evidence to prove the statement.



[View Text Solution](#)

**16.** Mention three important features of fossils which help in the study of evolution.



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**17.** Explain analogous organs and homologous organs. Identify the analogous and

homologous organs amongst the following:

Wings of an insect, wings of a bat, forelimbs of frog, forelimbs of a human.



[View Text Solution](#)

**18.** Describe the contribution of Lamarck.



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**19.** Name the organism Mendel used for his experiments. Explain about F<sub>1</sub> and F<sub>2</sub> progeny

obtained by Mendel when he bred the tall and the short varieties of the organism he experimented with.



[View Text Solution](#)

20. " It is possible that a trait is inherited but may not be expressed." Give a suitable example to justify this statement.



[View Text Solution](#)



21. With the help of an example justify the following statement: "A trait may be inherited, but may not be expressed".



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22. Name two homologous structures in vertebrates. Why are they so called? How do such organs help in understanding an evolutionary relationship?



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**23.** In a cross between plants with pink flowers and plants with white flowers the offsprings of  $F_1$  generation all had pink flowers. When the  $F_1$  generation was self-crossed, it was observed in the  $F_2$  generation that out of 100, 75 flowers were pink. Make a cross and answer the following:

(a) What are the genotypes of the  $F_1$  progeny?

(b) What is the ratio of Pink: White flowers in the  $F_2$  generation?



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**24.** List three factors that provide evidences in favour of evolution in organisms and state the role of each in brief.



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**25.** Does geographical isolation of individuals of a species lead to formation of a new species? Provide a suitable explanation.



[View Text Solution](#)

**26.** Give the basic features of the mechanism of inheritance.



**View Text Solution**

**27. A.** Mention any two points of difference between acquired and inherited traits.

**B.** If the tail of a mouse is cut for twenty one generations, will the tail occur in the twenty second generation of that mouse? Give reason

to support your answer.

C. Define the term-Natural Selection.



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**28.** In the following crosses write the characteristics of the progeny.

Cross	Progeny
(a) $RR YY \times RR YY$ Round, yellow and round, yellow	_____
(b) $Rr Yy \times Rr Yy$ Round, yellow and round, yellow	_____
(c) $rr yy \times rr yy$ Wrinkled, green and wrinkled, green	_____
(d) $RR YY \times rr yy$ Round, yellow and wrinkled, green	_____



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**29.** How do Mendel's experiments show that the

(a) traits may be dominant or recessive,

(b) traits are inherited independently?



**View Text Solution**

**30.** What are the various evidences in favour of evolution?



**View Text Solution**

**31.** Explain with an example for each, how the following provides evidences in favour of evolution in organisms:

(a) Homologous organs (b) Analogous organs

(c) Fossils



**View Text Solution**

**32.** Describe Darwin's theory of evolution.



**View Text Solution**

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**View Text Solution**

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**View Text Solution**



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self-pollinating plant species? Explain. Give reason to justify your answer.



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**37. A.** How does speciation take place?

B. Define the term gene.

C. The gene for red hair is recessive to the gene for black hair. What will be the hair colour of a child if he inherits a gene for red colour from his mother and a gene for black

hair from his father? Express with the help of flow chart.



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**38.** Explain the ways in which evolutionary relationships can be traced.



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**39.** How has the method of 'artificial selection' by humans helped in the evolution of different

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[View Text Solution](#)

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B. Define the term gene.

C. The gene for red hair is recessive to the gene for black hair. What will be the hair colour of a child if he inherits a gene for red colour from his mother and a gene for black hair from his father? Express with the help of flow chart.



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**77.** Explain the ways in which evolutionary relationships can be traced.



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**78.** How has the method of 'artificial selection' by humans helped in the evolution of different vegetables?



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1. Explain with reason why giraffe has long neck.



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2. Explain with reason why giraffe has long neck.



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1. Why do all the gametes formed in human females have X chromosome?



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2. In human beings, the statistical probability of getting either a male or female child is 50:50. Give a suitable explanation.



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3. Why did Mendel choose pea plant for his experiments?



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4. Give reasons for the appearance of new combinations of characters in the  $F_2$  progeny.



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5. Why is making anti-viral drugs more difficult than making anti-bacterial medicines?



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6. Evolution has exhibited a greater stability of molecular structure when compared with morphological structures. Comment on the statement and justify your opinion.



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7. Why do all the gametes formed in human females have X chromosome?



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**11.** Why is making anti-viral drugs more difficult than making anti-bacterial medicines?



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**12.** Evolution has exhibited a greater stability of molecular structure when compared with morphological structures. Comment on the statement and justify your opinion.



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