



BIOLOGY

BOOKS - OSWAAL BIOLOGY (KANNADA ENGLISH)

HEREDITY AND EVOLUTION

Topic 1 Heredity And Mendel S Contribution Multiple Choice Questions

1. A special property of DNA that ensures the equal distribution of similar genetic material to the offsprings is :

- A. mutation
- B. recombination
- C. replication
- D. variation

Answer: C



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2. Identify the correct complementary base pairing among the following :

- A. Adenine-Thymine and Guanine-Cytosine
- B. Adenine-Guanine and Thymine-Cytosine
- C. Adenine-Cytosine and Thymine-Guanine
- D. Guanine-Adenine and Cytosine-Adenine

Answer: A



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3. The probability of all offspring for the cross $Tt \times$ having T in the genotype will be.

- A. 0.5
- B. 0.25
- C. 0.75
- D. 1

Answer: A

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Topic 1 Heredity And Mendel S Contribution Match The Column

1. Match the Column

Column A	Column B
(1) Carl Correns	(a) Theory of Natural selection
(2) Mendel	(b) Use and Disuse of Organ
(3) Darwin	(c) Four O' Clock plant
(4) Lamarck	(d) Laws of Inheritance

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Topic 1 Heredity And Mendel S Contribution Very Short Answer Type Questions

1. What is DNA?

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2. How many pairs of chromosomes are present in human beings?

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3. Where is DNA found in a cell?

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4. What is heredity?

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5. Name the information source for making proteins in the cells.

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6. Give the respective scientific terms used for studying:

- (i) the mechanism by which variations are created and inherited and
- (ii) the development of new type of organisms from the existing ones.

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7. No two individuals are absolutely alike in population. Why?

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8. How does comparing the DNA of different species helps in evolutionary studies?

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9. How do genes control traits?

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10. When a black guinea pig is crossed with a white guinea pig, what coloured guinea pigs are obtained in F_1 if black colour is dominant over white?

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11. In a cross between a tall pea plant (TT) and a short pea plant (tt), what will be the characteristics shown by the F_1 generation?

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12. If the weight of an elephant is reduced because of starvation, the progeny elephants will not have low weight. Give reason.

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13. In a cross between round yellow seeds (RRYY) and wrinkled green seeds (rryy) of pea plant, what is the ratio of plants obtained in F_2 generation?

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14. In turtle, high incubation temperature leads to the development of female offspring. On the other hand in lizards, high incubation temperature leads to the development of male offspring. What determines the sex of the offspring in these examples?

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15. What is a gene?

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Topic 1 Heredity And Mendel S Contribution Short Answer Type Questions I

1. What are characteristics? Give an example.

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2. Where are the genes located? What is the chemical nature of gene?

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3. Why will each gamete contain only one gene set?

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4. Organisms showing asexual reproduction show very little variation from each other?

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5. "The chromosome number of the sexually reproducing parents and their offspring is the same." Justify this statement.



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6. What is the difference between F_1 generation and F_2 generation?

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7. During crossing, why do new features which are not present in the parents appear in the offsprings?

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8. Why cannot the experiences of an individual during its lifetime be passed on to its progeny?

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

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

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Topic 1 Heredity And Mendel S Contribution Short Answer Type Questions li

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

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2. 'It is a matter of chance whether a couple will give birth to a male child or a female child.' Justify this statement with the help of a flow chart showing the fusion of sex chromosomes.

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3. How is the sex determined in human beings?

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4. Explain Carl Correns's monohybrid cross in Four O'clock plant with the help of schematic representation.

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5. Explain the double helix structure of DNA molecule.



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6. (i) Define Genetics.

(ii) Who is regarded as the 'Father of Genetics'? Name the plant on which he performed his experiment.

(iii) Why did he select that specific plant for his experiments?

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7. With the help of suitable examples, explain why certain traits cannot be passed on to the next generation. What are such traits called?

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8. Explain Mendel's experiment with peas on inheritance of characters considering only one visible contrasting character.



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



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

maintained.

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12. Why cannot the experiences of an individual during its lifetime be passed on to its progeny?

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13. "A trait may be inherited, but may not be expressed." Justify this statement with the help of a suitable example.

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14. What is DNA copying? State its importance.

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15. "A trait may be inherited, but may not be expressed." Justify this statement with the help of a suitable example.

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16. In human beings, the statistical probability of getting either a male or a female child is 50%. Give reasons and explain with the help of a diagram.

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17. How do Mendel's experiments show that traits may be dominant or recessive? explain it with the help of a cross.

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18. (i) Name the unit of inheritance. What is its function?

(ii) How are inherited traits different from acquired traits? Give example.

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19. Show inheritance of two characters over two generations by making a cross between round and yellow seeded plant (RRYY) with wrinkled green seeded plant (rryy).

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

(i) What are the genotypes of the F_2 progeny?

(ii) What is the ratio of 'White : Purple' flowers in the F_2 generation?



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21. 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 appeared.

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

(ii) 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.



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



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23. In a monohybrid cross between tall pea plants (TT) and short pea plants (tt) a scientist obtained only tall pea plants (Tt) in the F_1 generation. However, on selfing the F_1 generation pea plants, he obtained both tall and short plants in F_2 generation. On the basis of above observations with other angiosperms also, can the scientist arrive at a law? If yes, explain the law. If not, give justification for your answer.

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24. '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.

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25. What will happen if both the characters present in F_1 generation pass together in F_2 generation?

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

- (i) What is the expected colour of the flowers in their F_1 progeny?
- (ii) What will be the percentage of plants bearing white flower in F_2 generation, when the flowers of F_1 plants were selfed?
- (iii) State the expected ratio of the genotype BB and BW in the F_2 progeny.

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27. A cross was made between pure breeding pea plant one with round and green seeds and the other with wrinkled and yellow seeds.

- (i) Write the phenotype of F_1 progeny. Give reason for your answer.
- (ii) Write the different types of F_2 progeny obtained along with their ratio when F_1 progeny was selfed.

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28. 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 appeared.

- (i) What happens to the traits of the dwarf plants in this case?
- (ii) 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.

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29. A cross was carried out between a pure bred tall pea plant and a pure bred dwarf pea plant and F_1 progeny was obtained. Later, the F_1 progeny was selfed to obtain F_2 progeny. Answer the following questions :

- (i) What is the phenotype of the F_1 progeny and why?
- (ii) Give the phenotypic ratio of the F_2 progeny.
- (iii) Why is the F_2 progeny different from the F_1 progeny?

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30. A blue colour flower plant denoted by BB is crossbred with a white colour flower plant denoted by ww.

- (i) State the colour of flower we would expect in their F_1 progeny.
- (ii) Write the percentage of plants bearing white flower in F_2 generation when the flowers of F_1 plants were selfed.
- (iii) State the expected ratio of the genotype BB : Bw : ww in the F_2 progeny.

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31. (i) Differentiate between dominant and recessive traits.

(ii) 'Gene control traits'? Explain this statement with an example.

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32. The genotype of green-stemmed tomato plants is denoted by GG and that of purple-stemmed tomato plants as gg. When these two plants are crossed :

(i) What colour of stem would you expect in their F_1 progeny?

(ii) Give the percentage of purple-stemmed plant if F_1 plants are self pollinated.

(iii) In what ratio would you find the green and purple colour in the F_1 progeny?

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33. With the help of a cross done with garden pea plants, trace the work done by Mendel with a tall and a short plant to arrive at a 3:1 ratio in the F_2 generation.

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34. In Mendel's monohybrid cross between tall and short pea plants, all offsprings were tall. What does this tell us about the trait? What is the ratio of tall and short plants in the F_2 generation?

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35. Explain with the help of a figure that father is responsible for the sex of a child.

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Topic 1 Heredity And Mendel S Contribution Long Answer Type Questions

1. (a) Why did Mendel choose garden pea for his experiments? Write two reasons.

(b) List two contrasting visible characters of garden pea Mendel used for his experiment.

(c) Explain in brief how Mendel interpreted his results to show that the traits may be dominant or recessive.

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

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3. (i) What is meant by traits of an individual?

(ii) Explain inherited trait and acquired trait.

(iii) Define speciation. List the factors which could lead to rise of a new species.

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4. (i) Why are two letters (such as TT, Tt, tt) used to denote the character of height?

(ii) If a purple pea plant (PP) is crossed with a white coloured pea plant (pp), will we have white flowered pea plant in the F₁ generation?

Why?

(iii) Define dominant and recessive traits.

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5. (i) Explain whether traits like eye colour or height is genetically inherited. Do power to lift weights and reading french also belong to the same category?

(ii) How do variations affect the evolution of those organisms that reproduce sexually?

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6. (i) Some dinosaurs had feathers but could not fly using these feathers. Why?

(ii) What is a sex chromosome?

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Topic 2 Origin Of Life And Evolution Multiple Choice Question

1. Identify the correct pair of analogous organ from the following:

- A. Forelimb of man and forelimb of a frog
- B. Wing of a butterfly and wing of a bat
- C. Wing of a bird and wing of a bat
- D. Forelimb of lizard and forelimb of a frog

Answer: B

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Topic 2 Origin Of Life And Evolution Match The Column

1. Match the Column

- | | |
|------------------------------|---|
| 1. Molecular phylogeny | (a) Can be traced back to African roots |
| 2. Skin colour | (b) Tracing changes in DNA |
| 3. Human genetic foot prints | (c) Trace the evolutionary relationship |
| 4. DNA study | (d) Used to identify race |

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Topic 2 Origin Of Life And Evolution Very Short Answer Type Questions

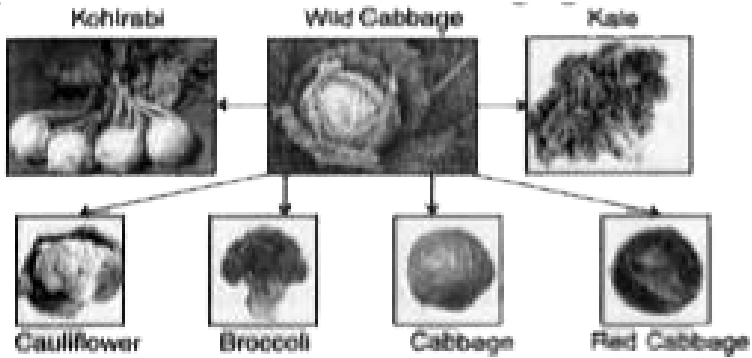
1. List any two factors that could lead to speciation?

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2. What is the only progressive trend seen in evolution?

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3. What is shown in the following figure?



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4. How does creation of variations in a species Cauliflower Broccoli Red Cabbage promote survival?

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5. Write the contribution of Charles Darwin in the field of evolution.

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6. Name the fossil shown in the figure below-



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7. How was the vegetable kale obtained from cabbage?

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8. What is the main reason for evolution according to Darwin?



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

- (i) flipper of whale
- (ii) foreleg of horse
- (iii) front leg of frog
- (iv) wings of housefly.



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



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11. 70% of individuals in a population of hydra show long tentacles whereas 10% of individuals in the same population show short tentacles. Which trait is likely to have arisen earlier?

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Topic 2 Origin Of Life And Evolution Short Answer Type Questions I

1. What are the physical changes that resulted in the upright posture in the course of evolution of human?

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2. Write any four physical features of Australopithecus man.

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3. Write full form of DNA. Where is it located?

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4. Name any four mechanisms which can lead to speciation in sexually reproducing organisms.

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5. Give two instances of species where geographical isolation does not lead to any speciation.

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6. What do the following terms mean?

(i) Micro-evolution,

(ii) Fossils.



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7. How does natural selection differ from genetic drift?



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



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



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

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11. In an area A, the leaf material available to beetles was very less. What are the two consequences seen in the beetles?

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Topic 2 Origin Of Life And Evolution Short Answer Type Questions Ii

1. (i) What are fossils? How do we know how old the fossils are?
(ii) State two differences between homologous and analogous organs.

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

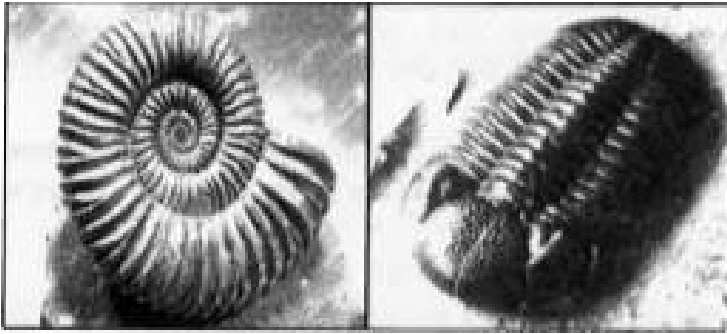
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3. A palaeontologist observes the jaw of an animal and concludes that it belong to mammals. Give reason for his conclusion.

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4. Differentiate between Caucasoid man and Mongoloid man based on their physical features.

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5.

(A)

(B)

(a) Identify the fossils A and B?

(b) What type of fossils are these?

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6. What is speciation? Explain in brief the role of natural selection and genetic drift in this process.

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7. Explain the terms

(i) Speciation (ii) Natural selection



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8. Define the following with one example for each :

(i) Genetic Drift.

(ii) Natural selection.

(iii) Reproductive isolation.



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9. Name three organisms which are fossilized.



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10. (i) Which of the following fossils is invertebrate and which one is vertebrate?

(a) Dinosaur, (b) Ammonite.

(ii) How can the age of fossil be ascertained? State in brief any two methods.

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11. Give two uses of fossils. How does the study of fossils provide evidence in favour of organic evolution?

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12. When organisms die, their bodies will decompose and be lost. Then how do we get fossils? Give an example.

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13. How were farmers able to obtain present day cabbage, cauliflower and broccoli from wild cabbage?

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14. "Evolution should not be equated with progress". Why?

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

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16. Homologous organs are different form analogous organs.

(i) Mention the two basic characteristics that decide about analogy and homology between the two organs.

(ii) On what basis is the classification of organisms into prokaryotic and eukaryotic done?

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17. There are two different types of organs, homologous and analogous. Differentiate between them by giving three points.

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18. All human races like Africans, Asians, Europeans, Americans and others look so different from each other still they belong to the same species. Give three points to justify the statement.

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

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20. (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.

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21. "It is a matter of chance whether a couple will have a male or a female child." Justify this statement by drawing a flowchart.

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22. (a) Cite the evidence on the basis of which it is concluded that birds have evolved from reptiles.

(b) Insects, Octopus, Planaria and Vertebrates also possess eyes. Can

these animals be grouped together on the basis of the eyes they possess. Why or why not? Give reason to justify your answer.

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23. The modern human beings have originated in Africa.

(i) Which evidence suggests this fact?

(ii) If an animal is similar to its ancestors, what does this imply?

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24. (i) A husband has 46 chromosomes, his wife has 46 chromosomes.

Then why don't their offsprings have 46 pairs of chromosomes, which is obtained by the fusion of male and female gametes?

(ii) "Geographical isolation is not a major factor in the speciation of a self pollinating plant species." Justify this statement with the help of an example.



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Topic 2 Origin Of Life And Evolution Long Answer Type Questions

1. Give two uses of fossils. How does the study of fossils provide evidence in favour of organic evolution?

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2. What is multiple fission? How does it occur in an organism? Explain briefly. Name one organism which exhibits this type of reproduction.

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3. What is meant by speciation? List four factors that could lead to speciation. Which of these cannot be a major factor in the speciation of a self-pollinating plant species. Give reason to justify your answer.



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4. What is meant by speciation? List four factors that could lead to speciation. Which of these cannot be a major factor in the speciation of a self-pollinating plant species. Give reason to justify your answer.



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5. (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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6. A particular species 'X' has more characteristics with species 'Y', whereas another species 'Z' has less common characteristics with species 'Y'. Which two species are more closely related? Why? On what basis are the eukaryotic organisms further classified? Why is this basis important? What is the importance of homologous organs?



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Ncert Corner 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 does Mendel's experiment show that traits may be dominant or recessive?

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4. How does Mendel's experiment 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 0 – is dominant? Why or why not?

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

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

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8. Why are traits acquired during the life time of an individual not inherited? Give one example for such trait

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9. Why are the 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 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 a 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 in 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?

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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 suggests 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 a dog's fore-leg

B. our teeth and an elephant's tusk.

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

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 area 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. Explain the importance of fossils in deciding evolutionary relationships.

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

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



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11. 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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