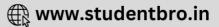


Multiple Choice Questions

- 1. Exchange of genetic material takes place in
 - (a) vegetative reproduction
 - (b) asexual reproduction
 - (c) sexual reproduction
 - (d) budding
- **2.** Two pink coloured flowers on crossing resulted in 1 red, 2 pink and 1 white flower progeny. The nature of the cross will be
 - (a) double fertilisation
 - (b) self pollination
 - (c) cross fertilisation
 - (d) no fertilisation
- **3.** A cross between a tall plant (TT) and short pea plant (tt) resulted in progeny that were all tall plants because
 - (a) tallness is the dominant trait
 - (b) shortness is the dominant trait
 - (c) tallness is the recessive trait
 - (d) height of pea plant is not governed by gene 'T' or 't'
- 4. Which of the following statement is incorrect?
 - (a) For every hormone there is a gene.
 - (b) For every protein there is a gene.
 - (c) For production of every enzyme there is a gene.
 - (d) For every molecule of fat there is a gene
- If a round, green seeded pea plant (RR yy) is crossed with wrinkled, yellow seeded pea plant, (rr YY) the seeds produced in F₁ generation are
 - (a) round and yellow
 - (b) round and green
 - (c) wrinkled and green
 - (d) wrinkled and yellow

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- **6.** In human males all the chromosomes are paired perfectly except one. This/these unpaired chromosome is/are
 - (i) large chromosome
 - (ii) small chromosome
 - (iii) Y-chromosome
 - (iv) X-chromosome
 - (a) (i) and (ii) (b) (iii) only
 - (c) (iii) and (iv) (d) (ii) and (iv)
- 7. The maleness of a child is determined by
 - (a) the X chromosome in the zygote
 - (b) the Y chromosome in zygote
 - (c) the cytoplasm of germ cell which determines the sex
 - (d) sex is determined by chance
- **8.** A zygote which has an X-chromosome inherited from the father will develop into a
 - (a) boy
 - (b) girl
 - (c) X- chromosome does not determine the sex of a child
 - (d) either boy or girl
- 9. Select the incorrect statement
 - (a) Frequency of certain genes in a population change over several generations resulting in evolution
 - (b) Reduction in weight of the organism due to starvation is genetically controlled
 - (c) Low weight parents can have heavy weight progeny
 - (d) Traits which are not inherited over generations do not cause evolution
- 10. New species may be formed if
 - (i) DNA undergoes significant changes in germ cells
 - (ii) chromosome number changes in the gamete

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- (iii) there is no change in the genetic material
- (iv) mating does not take place
- (a) (i) and (ii) (b) (i) and (iii)
- (c) (ii), (iii) and (iv) (d) (i), (ii) and (iii)
- **11.** Two pea plants one with round green seeds (RRyy) and another with wrinkled yellow (rrYY) seeds produce F_1 progeny that have round, yellow (RrYy) seeds. When F_1 plants are selfed, the F_2 progeny will have new combination of characters. Choose the new combination from the following

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- (i) Round, yellow
- (ii) Round, green
- (iii) Wrinkled, yellow
- (iv) Wrinkled, green
- (a) (i) and (ii) (b) (i) and (iv)
- (c) (ii) and (iii) (d) (i) and (iii)
- **12.** A basket of vegetables contains carrot, potato, radish and tomato. Which of them represent the correct homologous structures?
 - (a) Carrot and potato
 - (b) Carrot and tomato
 - (c) Radish and carrot
 - (d) Radish and potato
- 13. Select the correct statement
 - (a) Tendril of a pea plant and phylloclade of **Opuntia** are homologous
 - (b) Tendril of a pea plant and phylloclade of Opuntia are analogous
 - (c) Wings of birds and limbs of lizards are analogous
 - (d) Wings of birds and wings of bat are homologous
- **14.** If the fossil of an organism is found in the deeper layers of earth, then we can predict that
 - (a) the extinction of organism has occurred recently
 - (b) the extinction of organism has occurred thousands of years ago
 - (c) the fossil position in the layers of earth is not related to its time of extinction
 - (d) time of extinction cannot be determined
- **15.** Which of the following statements is not true with respect to variation?
 - (a) All variations in a species have equal chance of survival
 - (b) Change in genetic composition results in variation
 - (c) Selection of variants by environmental factors forms the basis of evolutionary processes.

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- (d) Variation is minimum in asexual reproduction
- 16. A trait in an organism is influenced by
 - (a) paternal DNA only
 - (b) maternal DNA only
 - (c) both maternal and paternal DNA
 - (d) neither by paternal nor by maternal DNA

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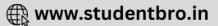
- **17.** Select the group which shares maximum number of common characters
 - (a) two individuals of a species
 - (b) two species of a genus
 - (c) two genera of a family
 - (d) two genera of two families
- **18.** According to the evolutionary theory, formation of a new species is generally due to
 - (a) sudden creation by nature
 - (b) accumulation of variations over several generations
 - (c) clones formed during asexual reproduction
 - (d) movement of individuals from one habitat to another
- **19.** From the list given below, select the character which can be acquired but not inherited
 - (a) colour of eye
 - (b) colour of skin
 - (c) size of body
 - (d) nature of hair
- **20.** The two versions of a trait (character) which are brought in by the male and female gametes are situated on
 - (a) copies of the same chromosome
 - (b) two different chromosomes
 - (c) sex chromosomes
 - (d) any chromosome
- 21. Select the statements that describe characteristics of genes
 - (i) genes are specific sequence of bases in a DNA molecule
 - (ii) a gene does not code for proteins
 - (iii) in individuals of a given species, a specific gene is located on a particular chromosome
 - (iv) each chromosome has only one gene
 - (a) (i) and (ii) (b) (i) and (iii)
 - (c) (i) and (iv) (d) (ii) and (iv)
- **22.** In peas, a pure tall plant (TT) is crossed with a short plant (tt). The ratio of pure tall plants to short plants in F_2 is
 - (a) 1 : 3
 - (b) 3 : 1
 - (c) 1 : 1
 - (d) 2 : 1

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- 23. The number of pair (s) of sex chromosomes in the zygote of humans is
 - (a) one (b) two
 - (c) three (d) four
- **24.** The theory of evolution of species by natural selection was given by
 - (a) Mendel (b) Darwin
 - (c) Morgan (d) Lamarck
- **25.** Some dinosaurs had feathers although they could not fly but birds have feathers that help them to fly. In the context of evolution this means that
 - (a) reptiles have evolved from birds
 - (b) there is no evolutionary connection between reptiles and birds
 - (c) feathers are homologous structures in both the organisms
 - (d) birds have evolved from reptiles

Short Answer Questions

- 26. How is the sex of a newborn determined in humans?
- **27.** Do genetic combination of mothers play a significant role in determining the sex of a new born?
- **28.** Mention three important features of fossils which help in the study of evolution.
- **29.** Why do all the gametes formed in human females have an X chromosome?
- **30.** In human beings, the statistical probability of getting either a male or female child is 50 : 50. Give a suitable explanation.
- **31.** A very small population of a species faces a greater threat of extinction than a larger population. Provide a suitable genetic explanation.
- **32.** What are homologous structures? Give an example. Is it necessary that homologous structures always have a common ancestor?
- **33.** Does the occurrence of diversity of animals on earth suggest their diverse ancestry also? Discuss this point in the light of evolution.
- **34.** Give the pair of contrasting traits of the following characters in pea plant and mention which is dominant and recessive

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- (i) yellow seed (ii) round seed
- **35.** Why did Mendel choose pea plant for his experiments?

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36. A woman has only daughters. Analyse the situation genetically and provide a suitable explanation.

Long Answer Questions

- **37.** Does geographical isolation of individuals of a species lead to formation of a new species? Provide a suitable explanation.
- **38.** Bacteria have a simpler body plan when compared with human beings. Does it mean that human beings are more evolved than bacteria? Provide a suitable explanation.
- **39.** 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.
- **40.** Differentiate between inherited and acquired characters. Give one example for each type.
- 41. Give reasons why acquired characters are not inherited.

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

43.	In the following crosses write	e the characteristics of the progeny

Cross	Progeny
(a) RR YY x RR YY	
Round, yellow Round, yellow (b) Rr Yy x Rr Yy	
Round, yellow Round, yellow (c) rr yy x rr yy	
wrinkled, green wrinkled, green	
(d) RR YY x rr yy Round, yellow wrinkled green	

44. Study the following cross and showing self pollination in F_1 , fill in the blank and answer the question that follows

RRYY	Х	rryy
Round, yellow		wrinkled, green
Rr Yy	х	<u>?</u>
Round, yellow		
	Round, yellow Rr Yy	Round, yellow Rr Yy x

- **45.** In question 44, what are the combinations of character in the F₂ progeny? What are their ratios?
- **46.** Give the basic features of the mechanism of inheritance.

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47. Give reasons for the appearance of new combinations of characters in the F₂ progeny.

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