

ASSIGNMENT QUESTIONS SET – 2
CHAPTER – 9
HEREDITY AND EVOLUTION

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
5. 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
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
 - (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 F1 progeny that have round, yellow (RrYy) seeds. When F1 plants are selfed, the F2 progeny will have new combination of characters. Choose the new combination from the following
- (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.
(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
- 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 F₂ is
- (a) 1 : 3
 - (b) 3 : 1
 - (c) 1 : 1
 - (d) 2 : 1
- 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
26. State one advantage of variation of a species. [2009]
27. What is the effect of DNA copying which is not perfectly accurate on the reproduction process? [2008]
28. What decides that humans give rise to humans? (Imp.)
29. What are hereditary characteristics?
30. Are the variations created by sexual reproduction heritable or non-heritable? (Imp.)
31. What are the components of a chromosome? (Imp.)
32. What is a retrovirus?
33. What is a sex chromosome?
34. How many chromosomes are there in a human ovum?
35. Who coined the term 'factor'? (Imp.)
36. Give the monohybrid ratio.
37. Write the dihybrid ratio.
38. Define the term 'speciation'.
39. What is a factor?
40. Name the most accepted theory of evolution.
41. Define the term 'evolution'.
42. Whose theory influenced Darwin? What did Darwin fail to explain? (Imp.)
43. Define 'recessive characteristic'.
44. What is the basis of sex determination in most plants and animals? (Imp.)
45. What are fossils? What do they tell about the process of evolution? [2008]
46. What do you understand by the term heredity? [2008]
47. What constitutes the link between one generation and the next? [2008]
48. "The sex of the children is determined by the what they inherit from their father and not from the mother." Justify. [2008]
49. Explain the terms analogous and homologous organs with one example of each. [2008]

50. 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? [2008]
51. Define variation in relation to a species. Why is variation beneficial to the species? [2008]
52. Describe briefly four ways in which individuals with a particular trait may increase in a population. [2008]
53. What are acquired characteristics? (Imp.)
54. What is variation?
55. Why is variation less common in asexually reproducing organisms?
56. Clarify the term heredity and variation. (Imp.)
57. Define variation in relation to a species. Why is variation beneficial to the species? (Imp.)
58. What are autosomes?
59. What is the reason that a male is called 'heterogametic'? (Imp.)
60. What was the basic study material of Mendel? How did he bring in the term 'factor'?
61. Why are the traits acquired during lifetime of an individual not inherited? [2009]
62. How is the sex of a newborn determined in humans?
63. Do genetic combination of mothers play a significant role in determining the sex of a new born?
64. Mention three important features of fossils which help in the study of evolution.
65. Why do all the gametes formed in human females have an X chromosome?
66. In human beings, the statistical probability of getting either a male or female child is 50 : 50. Give a suitable explanation.
67. A very small population of a species faces a greater threat of extinction than a larger population. Provide a suitable genetic explanation.
68. What are homologous structures? Give an example. Is it necessary that homologous structures always have a common ancestor?
69. Does the occurrence of diversity of animals on earth suggest their diverse ancestry also? Discuss this point in the light of evolution.
70. 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
71. Why did Mendel choose pea plant for his experiments?
72. A woman has only daughters. Analyse the situation genetically and provide a suitable explanation.
73. Does geographical isolation of individuals of a species lead to formation of a new species? Provide a suitable explanation.

74. 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.
 75. 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.
 76. Differentiate between inherited and acquired characters. Give one example for each type.
 77. Give reasons why acquired characters are not inherited.
 78. Evolution has exhibited a greater stability of molecular structure when compared with morphological structures. Comment on the statement and justify your opinion.
 79. Give the basic features of the mechanism of inheritance.
 80. Give reasons for the appearance of new combinations of characters in the F₂ progeny.
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