**CLASS - X Science (Heredity and Evolution)**

**PART-I**

1. The theory of chemical evolution of life was experimentally demonstrated by-

(a) Oparin (b) Miller and Urey (c) Mendel (d) Darwin (1)

2. Genetics is the study of-

(a) resemblances amongst individuals (b) heredity and environment (c) differences amongst individuals (d) Heredity and variations. (1)

3. Wing of a bird and wing of an insect are;-

(a) Homologous organs (b) analogous organs (c) vestigial organ (d) both (a) and (b) (1)

4. What is heredity? (1)

5. What are Mendelian factors? (1)

6. What will be the sex of the embryo if an egg is fertilized by the sperm having ;

(a) 22+x and (b) 22+y composition (2)

7. Mention two sources of variation. (2)

8. What is monohybrid and dihybrid cross? (2)

9. Why did Mendel choose pea plant for his experimentation? (2)

10. How does Archaeopteryx provide evidence for organic evolution? (3)

11. What is divergent evolution? Explain with the help of example. (3)

12. What is the difference between reproductive and non-reproductive variations? (3)

13. Write similarities between Mendalian’s factors and gene. (3)

PART-II

1. Two pink colored flowers on crossing results in 1red, 2pink and 1white flower progeny. The nature of the cross is- (a) cross fertilization (b) self pollination (c) double fertilization (d) no fertilization (1)

2. A basket of vegetable contains carrot, potato, radish, and tomato. Which of them represent the correct homologous structure (a) carrot and potato (b) carrot and tomato (c) radish and carrot (d) radish and potato (1)

3. Mendel proposed that every character is controlled by- (a) one factor (b) two factors (c) one chromosome (d) two chromosomes (1)

4. Who is called father of genetics? (1)

5. What is the scientific name of human being? (1)

6. Why acquired characters are not inherited? (2)

7. How is the chromosome number restored in zygote? (2)

8. What are variations? Give their types. (2)

9. Write difference between Autosomes or Allosomes. (2)

10. State the evolutionary force which leads to origin of a new species. (3)

11. What is a fossil? How do fossils tells us about the process of evolutions? (3)

12. Give difference between diploid and haploid. (3)

13. Who disproved Lamarckism and how? (3)

14. Give the basic features of the mechanism of inheritance. (5)

PART-III

1. The concept of origin of species by natural selection was given by. (A) lamarck (B) weismann (C) Darwin (D) Linnaeus (1)

2. It a round green seeded pea plant (RRYY) is grossed with wrinkled yellow seeded pea plant (rr yy) the seeds to be produced in fl generation will be. (A) Wrinkled and yellow (B) round and green (C) wrinkled and green (D) round and yellow. (1)

3. The genetic constitution of an organism is called. (A) Genotype (B) phenotype (C) variation (D) gene. (1)

4. Write the scientific name of the plant on which Mendel carried out his experiments. (1)

5. How many auto some are present in human sperm? (1)

6. What is emasculation? Why is it done? (2)

7. What is gene? Where are genes located? (2)

8. How many contrasting characins did Mendel see in garden pea? Give any two of them. (2)

9. What is phenotypic ratio obtained by Mendel by monohybrid clots? Answer with the help of diagram. (2)

10. Give difference between homologous and analogous organs. (3)

11. State three laws of Mendel. (3)

12. Describe how the sex of the offspring is determined is the zygote is human beings? (3)

13. Give a suitable explanation for “geographical isolation of individual of a species lead to formation of a new species? (3)

14. (i) Who provided the evidence of DNA as genetic material? (ii) Why DNA is called polynucleotide. (iii) List three important features of double helical model of DNA. (5)

PART-IV

1. Which of the following scientist gave the principles of inheritance? (a) Mendel (b) Griffin (c) Johanssen (d) Watson and crick (1)

2. Which of the following is not correct- (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. (1)

3. According to the evolutionary theory formation of a new species occurs 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. (1)

4. Who coined the term ‘gene’? (1)

5. What are dominant genes? (1)

6. Give the pair of contrasting traits of the following characters in plant and mention which one is recessive and which is dominant? (a) yellow seed (b) round seed (2)

7. Mention two important features of fossils which help in evolution. (2)

8. What do you understand by the term natural selection? (2)

9. Mention the compliment of a sperm and the egg which will determine the birth of female child. (2) 10. Differentiate between convergent and divergent evolution. (3)

11. What are the different ways in which individuals with a particular trait may increase in a population? (3)

12. What are the different theories about origin of life? (3)

13. What is the difference between chemical evolution and organic evolution? (3)

PART-V

1. Select the group which shares maximum number of common characters- (a) two genera of two families (b) two species of a genus (c) two genera of a family (d) two individuals of a species (1)

2. Two pea plants one with round green seeds (RRyy) and another with wrinkled yellow (rrYY) seeds produce F1 progeny having round, yellow (RrYy) seeds. When F1 plants are selfed, the F2 progeny will have the following combination of characters (a) 15:1 (b) 9:3:3:1 (c) 9:3:4 (d) 12:3:1 (1)

3. Some dinosaurs had feathers although they could not fly but birds have fathers 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 structure in both the organisms (d) Birds have evolved from reptiles. (1)

4. What is monohybrid cross? (1)

5. What are autosomes and sex chromosomes? (1)

6. Why acquired traits are not inherited? (2)

7. How evolution and classification are linked? (2)

8. What are coacervates? (2)

9. How do the two factors for a character, present in diploid cells, behave at the time gamete formation? (2)

10. 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? (3)

11. What are the different approaches to determine evolutionary history of man? (3)

12. What is fossilization? How are fossils formed? (3)

13. What are homologous and analogous organ? Explain with the help of example. (3)

PART-VI

1. Name an animal in which individuals can change sex. What does this indicate? (1 mark)

2. What is a gene? (1 mark)

3. Write the scientific term used for ‘science of heredity and variation’? (1 mark)

4. Explain why evolution cannot be said to progress from lower forms to higher forms. (2 marks)

5. How does the creation of variations in a species promote survival? (2 marks)

6. What are the different ways in which individuals with a particular trait may increase in a population? (2 marks)

7. Give an example of characteristics being used to determine how close two species are in evolutionary terms. (2 marks)

8. 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? (2 marks)

9. How is the sex of the child determined in human beings? (3 marks)

10. What are fossils? What do they tell us about the process of evolution? (3 marks)

11. Define the term ‘evolution’. Why are traits acquired during the life-time of an individual not inherited? (3 marks)

12. Define ‘evolution’? State Darwin’s theory of evolution. (5marks)

PART-VII

1. Define inheritance. (1mark)

2. Out of the wings of a bird, wing of an insect and the wing of a bat: (1 mark) (i) Which two are homologous organs? (ii)Which two are analogous organs?

3. State 1 characteristic to shows that the birds are vary closely related to dinosaurs. (1mark)

4. How do Mendel’s experiments show that traits may be dominated or recessive? (2 marks)

5. Will geographical isolation be a major factor in the speciation of an organism that reproduces asexually? Why or why not? (2 marks)

6. A study found that children with light coloured eye are likely to have parents with lightcoloured eyes. On this basis, can we say anything about whether the light eye colour trait is dominant or necessive? Why or why not? (2 marks)

7. Can the wing of a butterfly and the wing of a bat be considered homologous organs? Why or why not? (2 marks)

8. Why the traits acquired during the life time of an individual not inherited? (2 marks)

9. Write how is the equal genetic contribution of male and female parents ensured in the progeny? (3 marks)

10. A man with blood group A marries a woman with group O and their daughter has blood group O. Is this information enough to tell you which of the traits-blood group A or blood group O is dominant? (3 marks)

11. (i) What is ‘genetics’? (ii) Give the common name of the plant on which Mendel performed its experiments. (iii) What for did Mendel use the term factors and what are these factors called now? (iv) What are genes? Where are the genes located? (5 marks)

PART-VIII

1. Define homologous organs. (1 mark)

2. 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? (1 mark)

3. What are fossils? (1 mark)

4. What are vestigial organs? Explain with example. (2 marks)

5. Pure-bred pea plant A are crossed with pure-bred pea plant B. It is found that the plants which look like A do not appear in F1 generation but re-emerge in F2 generation. Which of the two plants are: (i)Tall and (ii) Dwarf? Give reason for your answer. (2 marks)

6. What evidence do we have for the origin of life from inanimate matter? (2 marks)

7. Give any two reasons why Mendel selected pea for his experiments? (2 marks)

8. How does the creation of variation in a species ensure survival? (2 marks)

9. Sugges with reason; which of the following are homologous and which are the analogous organs. (i)Scales of fishes and shell of molluse (ii)Trunk of elephant and hand of chimpanzee (iii)Waists of human being and claw of cat.

10. Define the term ‘heredity’. In which types of organism is heredity supposed to be better define in sexually reproducing or asexually reproducing king? Why? (3 marks)

11. What are homologous organs? How do they differ from analogous? How does the study of comparative anatomy provide evidence in favour of organic evoluation? (5 marks)

PART-IX

1. Define heredity. (1 mark)

2. What is speciation? (1 mark)

3. Define variation? (1 mark)

4. Differentiate between homologous organs and analogous organs. (2 marks)

5. If a trait A exist 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? (2 marks)

6. Why are the small numbers of surviving tigers a cause of worry from the points of view of genetics? (2 marks)

7. Will geographical isolation be a major factor in the speciation of a self-pollinating plant species? Why or why not? (2 marks)

8. Explain the mechanism of sex determination in human beings. (2 marks)

9. Define fossils. Explain briefly any two ways in which the study of fossils helps in understanding about the base life. (3 marks)

10. In evolutionary terms, can we say which among bacteria, spiders, fish and chimpanzees have a better body design? Why or why not? (3 marks)

11. Explain with example how characteristics of a population changes over the year for the following situations: (i) To gain survival advantages (ii)Due to accidental survival (iii) Temporary change of characteristics. (5 marks)