
📘 Chapter 9 – Heredity and Evolution (30 Important Q&A)

Basic Concepts

Q1. Define heredity.
Ans: Transmission of characteristics from parents to offspring.

Q2. Define evolution.
Ans: Gradual changes in organisms over generations leading to new species.

Q3. Who is called the father of genetics?
Ans: Gregor Mendel

Q4. What are genes?
Ans: Units of heredity that determine traits; located on chromosomes.

Q5. What is a trait?
Ans: A characteristic of an organism, e.g., eye color, height.

Mendelian Genetics

Q6. Mendel studied inheritance in:
Ans: Pea plants

Q7. Define dominant trait.
Ans: Trait that appears in the F1 generation when two contrasting traits are present.

Q8. Define recessive trait.
Ans: Trait that is masked in F1 generation but appears in F2 generation.

Q9. What is homozygous?
Ans: Having two identical alleles for a trait.

Q10. What is heterozygous?
Ans: Having two different alleles for a trait.

Monohybrid and Dihybrid Cross

Q11. Define monohybrid cross.
Ans: Cross between two individuals differing in one trait.

Q12. Define dihybrid cross.

Ans: Cross between two individuals differing in two traits.

Q13. Mendel's ratio for monohybrid cross (F2):

Ans: 3:1 (dominant:recessive)

Q14. Mendel's ratio for dihybrid cross (F2):

Ans: 9:3:3:1

Q15. Examples of dominant trait in pea plant:

Ans: Tall stem, yellow seeds

Sex Determination

Q16. Human sex is determined by:

Ans: X and Y chromosomes

Q17. Female sex chromosome:

Ans: XX

Q18. Male sex chromosome:

Ans: XY

Q19. Sperm determines sex because:

Ans: Sperm carries either X or Y chromosome, egg always carries X.

Q20. Male child inherits:

Ans: X from mother, Y from father

Evolution

Q21. Lamarck's theory:

Ans: Inheritance of acquired characteristics; traits developed during lifetime are passed to offspring.

Q22. Darwin's theory:

Ans: Natural selection – survival of the fittest; organisms with favorable traits survive and reproduce.

Q23. Variation is important because:

Ans: Provides material for evolution; allows adaptation to changing environment.

Q24. Adaptation is:

Ans: Characteristics that help an organism survive in its environment.

Q25. Fossils provide evidence of:

Ans: Evolution and history of organisms.

Speciation and Modern Evolution

Q26. Speciation is:
Ans: Formation of new species from existing species over generations.

Q27. Mutation leads to:
Ans: Variation, which can be beneficial or harmful.

Q28. Natural selection favors:
Ans: Organisms with traits suitable for the environment.

Q29. Example of adaptive evolution:
Ans: Peppered moth – color variation helped survive pollution changes.

Q30. Evolution is supported by:
Ans: Fossils, comparative anatomy, embryology, and molecular biology.