1. A change in DNA sequence that results in variation is called:
   A. Recombination B. Mutation
   C. Translation D. Replication (B)

Explanation : Mutation is a change in DNA sequence that can alter the genotype and phenotype of an organism.

2. Chromosomal aberrations are commonly seen in:
   A. Normal cells
   B. Cancer cells
   C. Red blood cells
   D. Gametes only (B)

Explanation : Changes in chromosomes due to DNA segment loss or gain are commonly observed in cancer cells.

3. Which of the following is a physical mutagen?
   A. Cigarette smoke
   B. Nitrates
   C. UV rays
   D. Preservatives (C)

Explanation : UV rays and X-rays are physical factors that can cause mutations.

4. Mutation caused by a change in a single base pair is called:
   A. Frame shift mutation
   B. Point mutation
   C. Chromosomal mutation
   D. Genomic mutation (B)

Explanation : Point mutation involves alteration of a single base pair in DNA.

5. Sickle cell anaemia is caused due to:
   A. Frame shift mutation
   B. Point mutation
   C. Chromosomal deletion
   D. Gene duplication (B)

Explanation : Sickle cell anaemia occurs due to a point mutation in the β-globin gene, causing abnormal haemoglobin formation.

6. A mutation caused by addition or deletion of base pairs is called:
   A. Point mutation
   B. Frame shift mutation
   C. Silent mutation
   D. Chromosomal mutation (B)

Explanation : Addition or deletion of base pairs shifts the reading frame and is called a frame shift mutation.

7. Pedigree analysis is used to study:
   A. DNA replication
   B. Lineage history of a trait
   C. Protein synthesis
   D. Cell division (B)

Explanation : Pedigree analysis studies the inheritance pattern of a particular trait through generations.

8. Which symbol represents a male individual in human pedigree analysis?
   A. Circle B. Square
   C. Diamond D. Triangle (B)

Explanation : In pedigree charts, a square represents a male individual, while a circle represents a female.

9. Sickle-cell anaemia is an example of:
   A. Autosomal dominant trait
   B. Autosomal recessive trait
   C. Sex-linked trait
   D. Y-linked trait (B)

Explanation : Sickle-cell anaemia is inherited as an autosomal recessive disorder.

10. Pedigree studies are important in human genetics to detect:
    A. Photosynthesis rate
    B. Specific traits, abnormalities and diseases
    C. Chromosome number only
    D. Protein structure (B)

Explanation : Pedigree analysis helps identify inheritance patterns of genetic traits, abnormalities, and diseases.