

Fundamentals of Genetics

Genetics · Practice Test · 25 Questions

1. Which molecule carries the genetic instructions for the development and functioning of all known living organisms?

- A) Deoxyribonucleic acid
- B) Adenosine triphosphate
- C) Ribonucleic acid
- D) Hemoglobin

2. What are the alternative forms of a specific gene located at a given position on a chromosome?

- A) Alleles
- B) Gametes
- C) Zygotes
- D) Proteins

3. In human cells, how many pairs of chromosomes are typically contained within the nucleus?

- A) 22
- B) 23
- C) 46
- D) 48

4. Which nitrogenous base is found in RNA but not in DNA?

- A) Cytosine
- B) Guanine
- C) Thymine
- D) Uracil

5. What term describes an organism that has two identical alleles for a particular trait?

- A) Heterozygous
- B) Homozygous
- C) Dominant
- D) Recessive

6. Who is widely considered the father of modern genetics due to his experiments with pea plants?

- A) Charles Darwin
- B) Louis Pasteur
- C) Gregor Mendel
- D) James Watson

7. What is the physical expression or observable characteristic of an individual's genetic makeup called?

- A) Genotype
- B) Karyotype
- C) Phenotype
- D) Genome

8. Which process results in the formation of four genetically diverse haploid daughter cells?

- A) Mitosis
- B) Meiosis
- C) Binary fission
- D) Transcription

9. What is the sugar component found in the backbone of a DNA molecule?

- A) Glucose
- B) Ribose
- C) Deoxyribose
- D) Fructose

10. Which enzyme is responsible for synthesizing new DNA strands during replication?

- A) DNA polymerase
- B) Amylase
- C) Pepsin
- D) Lipase

11. What is a permanent alteration in the DNA sequence that makes up a gene?

- A) Mutation
- B) Translation
- C) Recombination
- D) Transcription

12. In Mendelian genetics, what is the ratio of offspring expected in the F₂ generation from a cross between two heterozygotes (Aa x Aa)?

- A) 1:1
- B) 2:1
- C) 3:1
- D) 9:3:3:1

13. Which structure within a cell serves as the site for protein synthesis?

- A) Mitochondria
- B) Nucleus
- C) Ribosome
- D) Lysosome

14. What type of bond holds the complementary nitrogenous bases together in a DNA double helix?

- A) Ionic bond
- B) Covalent bond
- C) Hydrogen bond
- D) Metallic bond

15. What is the specific location of a gene on a chromosome called?

- A) Locus
- B) Centromere
- C) Telomere
- D) Chromatid

16. How many bases of DNA code for a single amino acid?

- A) One
- B) Two
- C) Three
- D) Four

17. Which term refers to the complete set of genetic material present in an organism?

- A) Proteome
- B) Genome
- C) Transcriptome
- D) Chromatin

18. What is the primary function of mRNA in the cell?

- A) Storing genetic information
- B) Catalyzing chemical reactions
- C) Carrying genetic code to ribosomes
- D) Providing structural support

19. Which pair of sex chromosomes indicates a biological male in humans?

- A) XX
- B) XY
- C) YY
- D) XO

20. What is the name of the process by which DNA is copied into RNA?

- A) Translation
- B) Replication
- C) Transcription
- D) Transformation

21. Which part of the chromosome protects it from deterioration during cell division?

- A) Centromere
- B) Telomere
- C) Exon
- D) Intron

22. What does 'genotype' specifically refer to?

- A) The physical appearance
- B) The genetic constitution of an individual
- C) The environmental influence on traits
- D) The number of cells in an organism

23. What is an organism that contains genetic material from a different species called?

- A) Mutant
- B) Transgenic
- C) Haploid
- D) Polyploid

24. Which of these is a purine base found in DNA?

- A) Cytosine
- B) Thymine
- C) Adenine
- D) Uracil

25. What is the function of the centromere during cell division?

- A) To produce proteins
- B) To hold sister chromatids together
- C) To replicate DNA
- D) To transport waste out of the cell