Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

MCQs on Genetics

1. What is genetics?
   a. The study of cells and tissues
   b. The study of genes, genetic variation, and heredity
   c. The study of microorganisms
   d. The study of human anatomy
   Ans: b.The study of genes, genetic variation, and heredity

2. Who is known as the "Father of Genetics"?
   a. Charles Darwin
   b. Gregor Mendel
   c. Watson and Crick
   d. Robert Hooke
   Ans: b.Gregor Mendel

3. Which molecule carries genetic information?
   a. RNA
   b. DNA
   c. Protein
   d. Lipid
   Ans: b.DNA

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Topic	Genetics	**Last updated on**	28 March 2025

4. What are the units of heredity?
   a. Chromosomes
   b. Proteins
   c. Genes
   d. Nucleotides
   Ans: c.Genes

5. Which of the following is an example of a genetic disorder?
   a. Diabetes
   b. Sickle cell anemia
   c. Malaria
   d. Tuberculosis
   Ans: b.Sickle cell anemia

6. What is the shape of a DNA molecule?
   a. Linear chain
   b. Double helix
   c. Triple spiral
   d. Circular
   Ans: b.Double helix

7. What are the nitrogenous bases present in DNA?
   a. Adenine, Guanine, Cytosine, Thymine
   b. Adenine, Guanine, Cytosine, Uracil
   c. Adenine, Guanine, Uracil, Thymine
   d. Adenine, Guanine, Cytosine, Histone
   Ans: a.Adenine, Guanine, Cytosine, Thymine

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

8. Which law of Mendel states that alleles segregate independently during gamete formation?
   a. Law of Dominance
   b. Law of Segregation
   c. Law of Independent Assortment
   d. Law of Mutation
   Ans: c.Law of Independent Assortment

9. What is a genotype?
   a. The observable traits of an organism
   b. The genetic makeup of an organism
   c. The study of environmental influences
   d. The physical environment of a species
   Ans: b.The genetic makeup of an organism

10. Which genetic disorder is caused by an extra copy of chromosome 21?
    a. Down Syndrome
    b. Turner Syndrome
    c. Hemophilia
    d. Cystic Fibrosis
    Ans: a.Down Syndrome

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

11. What is monohybrid inheritance?
    a. Inheritance of a single pair of contrasting traits
    b. Inheritance of multiple traits
    c. Inheritance of sex-linked traits
    d. Inheritance of acquired characteristics
    Ans: a.Inheritance of a single pair of contrasting traits

12. In Mendel's monohybrid cross, the parental generation consists of:
    a. A hybrid tall and a hybrid dwarf plant
    b. A pure-breeding tall plant and a pure-breeding dwarf plant
    c. Two hybrid plants
    d. Two heterozygous plants
    Ans: b.A pure-breeding tall plant and a pure-breeding dwarf plant

13. In the F1 generation of a monohybrid cross between a pure tall and a pure dwarf plant, what is the phenotype of the offspring?
    a. All dwarfs
    b. All tall
    c. Half tall, half dwarf
    d. Three-fourths tall and one-fourth dwarf
    Ans: b.All tall

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

14. In the F2 generation of a monohybrid cross, what is the phenotypic ratio?
    a. 1:1
    b. 3:1
    c. 2:1
    d. 1:2:1
    Ans: b.3:1

15. What is the genotypic ratio of the F2 generation in a monohybrid cross?
    a. 3:1
    b. 2:1
    c. 1:2:1
    d. 4:0
    Ans: c.1:2:1

16. Which of Mendel's laws explains the 3:1 phenotypic ratio observed in the F2 generation?
    a. Law of Dominance
    b. Law of Segregation
    c. Law of Independent Assortment
    d. Law of Mutation
    Ans: b.Law of Segregation

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

17. If "T" represents the tall allele and "t" represents the dwarf allele, what is the genotype of a heterozygous tall plant?
    a. TT
    b. Tt
    c. tt
    d. None of the above
    Ans: b.Tt

18. What are chromosomes made of?
    a. Proteins and lipids
    b. DNA and proteins
    c. RNA and carbohydrates
    d. Nucleotides and sugars
    Ans: b.DNA and proteins

19. Where are chromosomes located in a eukaryotic cell?
    a. Cytoplasm
    b. Nucleus
    c. Mitochondria
    d. Ribosomes
    Ans: b.Nucleus

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

20. How many chromosomes are present in a normal human somatic cell?

a. 23

b. 46

c. 22

d. 44

Ans: b.46

21. Which type of chromosome determines the sex of an individual?

a. Autosome

b. Somatic chromosome

c. Sex chromosome

d. Mitochondrial chromosome

Ans: c.Sex chromosome

22. What is the shape of bacterial chromosomes?

a. Linear

b. Circular

c. Helical

d. Double-stranded

Ans: b.Circular

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

23. What are homologous chromosomes?

a. Identical chromosomes from the same parent

b. Chromosomes that are functionally different

c. A pair of chromosomes, one from each parent, with similar genes

d. Extra copies of chromosomes

Ans: c.A pair of chromosomes, one from each parent, with similar genes

24. Which of the following best describes a diploid cell?

a. A cell with one set of chromosomes

b. A cell with two sets of chromosomes

c. A cell with three sets of chromosomes

d. A cell without chromosomes

Ans: b.A cell with two sets of chromosomes

25. What is the short arm of a chromosome called?

a. Q arm

b. P arm

c. Centromere

d. Telomere

Ans: b.P arm

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

26. Which structure holds the two sister chromatids together?

a. Telomere

b. Centromere

c. Histone

d. Nucleosome

Ans: b.Centromere

27. Which condition occurs due to an extra copy of chromosome 21?

a. Turner syndrome

b. Klinefelter syndrome

c. Down syndrome

d. Hemophilia

Ans: c.Down syndrome

28. How many types of chromosomes are found in human cells?

a. 2

b. 3

c. 4

d. 5

Ans: a.2 (Autosomes and Sex Chromosomes)

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

29. Which of the following chromosomes determines the sex of an organism?

a. Autosomes

b. Sex chromosomes

c. Mitochondrial chromosomes

d. Polytene chromosomes

Ans: b.Sex chromosomes

30. How many pairs of autosomes do humans have?

a. 22

b. 23

c. 44

d. 2

Ans: a.22

31. Which of the following is NOT a type of chromosome based on centromere position?

a. Metacentric

b. Submetacentric

c. Holocentric

d. Heterochromatin

Ans: d.Heterochromatin

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

32. A chromosome with the centromere in the middle, making both arms equal in length, is called:
    a. Metacentric
    b. Submetacentric
    c. Acrocentric
    d. Telocentric
    Ans: a.Metacentric

33. Which type of chromosome has the centromere slightly off-center, making one arm slightly longer than the other?
    a. Metacentric
    b. Submetacentric
    c. Acrocentric
    d. Telocentric
    Ans: b.Submetacentric

34. A chromosome with the centromere very close to one end, resulting in one very short and one long arm, is called:
    a. Metacentric
    b. Submetacentric
    c. Acrocentric
    d. Telocentric
    Ans: c.Acrocentric

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

35. Which chromosome type has the centromere at the terminal end?
    a. Metacentric
    b. Submetacentric
    c. Acrocentric
    d. Telocentric
    Ans: d.Telocentric

36. Which type of chromosome is found in some plants and insects, where the centromere is spread along the entire chromosome length?
    a. Metacentric
    b. Polytene
    c. Holocentric
    d. Telocentric
    Ans: c.Holocentric

37. Which chromosomes are present in equal numbers in both males and females?
    a. Autosomes
    b. Sex chromosomes
    c. Heterochromatin chromosomes
    d. Acrocentric chromosomes
    Ans: a.Autosomes

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

38. Which structure in a chromosome determines its classification based on centromere position?
    a. Telomere
    b. Chromatid
    c. Centromere
    d. Nucleosome
    Ans: c.Centromere

39. A chromosome with the centromere in the middle, resulting in equal-length arms, is called:
    a. Metacentric
    b. Submetacentric
    c. Acrocentric
    d. Telocentric
    Ans: a.Metacentric

40. Which type of chromosome has the centromere slightly off-center, making one arm slightly longer than the other?
    a. Metacentric
    b. Submetacentric
    c. Acrocentric
    d. Telocentric
    Ans: b.Submetacentric

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

41. A chromosome with the centromere very close to one end, producing a very short and a very long arm, is called:
    a. Metacentric
    b. Submetacentric
    c. Acrocentric
    d. Telocentric
    Ans: c.Acrocentric

42. A chromosome with the centromere at the terminal end, having only one visible arm, is known as:
    a. Metacentric
    b. Submetacentric
    c. Acrocentric
    d. Telocentric
    Ans: d.Telocentric

43. Which type of chromosome is NOT found in humans?
    a. Metacentric
    b. Submetacentric
    c. Acrocentric
    d. Telocentric
    Ans: d.Telocentric

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

44. In which type of chromosome are the p-arm and q-arm of equal length?
    a. Metacentric
    b. Submetacentric
    c. Acrocentric
    d. Telocentric
    Ans: a.Metacentric

45. What is the long arm of a chromosome called?
    a. P arm
    b. Q arm
    c. Centromere
    d. Telomere
    Ans: b.Q arm

46. Which type of chromosome is commonly involved in the formation of the nucleolus in the nucleus?
    a. Metacentric
    b. Submetacentric
    c. Acrocentric
    d. Telocentric
    Ans: c.Acrocentric

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

47. Which of the following best describes the centromere position in a submetacentric chromosome?

a. In the center

b. Slightly off-center

c. Near one end

d. At the terminal end

Ans: b.Slightly off-center

48. Which nitrogenous base pairs with Adenine (a. in DNA?

a. Guanine (G)

b. Cytosine (c.

c. Thymine (T)

d. Uracil (U)

Ans: c.Thymine (T)

49. Adenine (a. and Thymine (T) are linked by how many hydrogen bonds?

a. One

b. Two

c. Three

d. Four

Ans: b. Two

Name of the Bundle	Proficient Bundle V2	Subject	Competitive Exams Training (Science & Geography)
Topic	Genetics	Last updated on	28 March 2025

50. Cytosine (c. and Guanine (G) are linked by how many hydrogen bonds?

a. One

b. Two

c. Three

d. Four

Ans: c.Three

51. Which of the following base pairs is incorrect?

a. A = T

b. C ≡ G

c. G = A

d. T = A

Ans: c.G = A

52. What type of bond holds the complementary base pairs together in DNA?

a. Covalent bonds

b. Ionic bonds

c. Hydrogen bonds

d. Peptide bonds

Ans: c.Hydrogen bonds

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

53. Which base is found in DNA but is replaced by Uracil (U) in RNA?

a. Adenine (a.

b. Thymine (T)

c. Cytosine (c.

d. Guanine (G)

Ans: b.Thymine (T)

54. What is the complementary DNA strand for the sequence: ATCG?

a. TAGC

b. CGAT

c. AGTC

d. GCTA

Ans: a.TAGC

55. Which base pairing contributes more to DNA stability due to having more hydrogen bonds?

a. A = T

b. C ≡ G

c. A = G

d. T = C

Ans: b.C ≡ G

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

56. What is the significance of hydrogen bonding in DNA structure?

a. It strengthens the phosphate backbone

b. It holds the two DNA strands together

c. It prevents mutations from occurring

d. It forms ribosomal RNA

Ans: b.It holds the two DNA strands together

57. Which base pairing rule ensures uniform width in the DNA double helix?

a. A pairs with G, C pairs with T

b. Purines always pair with pyrimidines

c. Random base pairing occurs

d. DNA strands are unpaired

Ans: b. Purines always pair with pyrimidines

58. What is a chromosomal mutation?

a. A change in the sequence of DNA in a single gene

b. A change in the structure or number of chromosomes

c. A temporary change in cell function

d. A mutation affecting only the mitochondria

Ans: b.A change in the structure or number of chromosomes

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

59. Which of the following is a chromosomal disorder caused by an extra copy of chromosome 21?
    a. Turner syndrome
    b. Down syndrome
    c. Klinefelter syndrome
    d. Huntington's disease
    Ans: b.Down syndrome

60. Which chromosomal mutation results in the loss of a chromosome segment?
    a. Duplication
    b. Deletion
    c. Translocation
    d. Inversion
    Ans: b.Deletion

61. Klinefelter syndrome is caused by which chromosomal abnormality?
    a. 45, XO
    b. 47, XXY
    c. Trisomy 21
    d. Monosomy 5
    Ans: b.47, XXY

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

62. Which disorder is caused by the absence of one X chromosome in females (45, XO)?
    a. Down syndrome
    b. Turner syndrome
    c. Klinefelter syndrome
    d. Patau syndrome
    Ans: b.Turner syndrome

63. Cri-du-chat syndrome is caused by:
    a. Deletion on chromosome 5
    b. Extra chromosome 13
    c. Extra X chromosome
    d. Inversion on chromosome 11
    Ans: a.Deletion on chromosome 5

64. Which chromosomal disorder is associated with trisomy 18?
    a. Turner syndrome
    b. Edward syndrome
    c. Patau syndrome
    d. Down syndrome
    Ans: b.Edward syndrome

Name of the Bundle	Proficient Bundle V2	Subject	Competitive Exams Training (Science & Geography)
Topic	Genetics	Last updated on	28 March 2025

65. Which type of chromosomal mutation involves a chromosome segment breaking off and attaching to a non-homologous chromosome?
    a. Duplication
    b. Deletion
    c. Translocation
    d. Inversion
    Ans: c.Translocation

66. Patau syndrome (Trisomy 13) is caused by:
    a. An extra chromosome 13
    b. A missing X chromosome
    c. A duplication on chromosome 7
    d. An inversion on chromosome 18
    Ans: a.An extra chromosome 13

67. Which chromosomal mutation results in a reversed segment within the same chromosome?
    a. Translocation
    b. Deletion
    c. Duplication
    d. Inversion
    Ans: d. Inversion

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

68. What is the chromosomal abnormality that causes Down's Syndrome?

a. Monosomy 21

b. Trisomy 18

c. Trisomy 21

d. Deletion on chromosome 5

Ans: c.Trisomy 21

69. How many total chromosomes does a person with Down Syndrome typically have?

a. 44

b. 45

c. 46

d. 47

Ans: d.47

70. Sickle Cell Anemia is caused by a mutation in which gene?

a. Hemoglobin A gene

b. Hemoglobin S gene

c. Beta-globin gene

d. Alpha-globin gene

Ans: c.Beta-globin gene

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

71. What type of mutation causes Sickle Cell Anemia?
    a. Deletion
    b. Frameshift
    c. Point mutation (Substitution)
    d. Insertion
    Ans: c.Point mutation (Substitution)

72. In Sickle Cell Anemia, which amino acid is replaced by valine in the hemoglobin protein?
    a. Glutamic acid
    b. Glycine
    c. Proline
    d. Alanine
    Ans: a. Glutamic acid

73. Sickle Cell Anemia affects which component of blood?
    a. White blood cells
    b. Platelets
    c. Red blood cells
    d. Plasma
    Ans: c.Red blood cells

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

74. What shape do red blood cells take in individuals with Sickle Cell Anemia?

a. Round

b. Crescent or sickle-shaped

c. Oval

d. Irregularly spiky

Ans: b.Crescent or sickle-shaped

75. Which type of hemoglobin is affected in Sickle Cell Anemia?

a. Hemoglobin A

b. Hemoglobin F

c. Hemoglobin S

d. Hemoglobin C

Ans: c.Hemoglobin S

76. Sickle Cell Anemia is inherited in which pattern?

a. Autosomal dominant

b. Autosomal recessive

c. X-linked dominant

d. X-linked recessive

Ans: b.Autosomal recessive

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

77. Which major symptom is associated with Sickle Cell Anemia?

a. Joint pain and fatigue

b. Excessive bleeding

c. Vision loss

d. Hearing impairment

Ans: a.Joint pain and fatigue

78. Which organ is commonly damaged due to blocked blood flow in Sickle Cell Anemia?

a. Kidney

b. Spleen

c. Lungs

d. Stomach

Ans: b.Spleen

79. Sickle Cell Anemia provides resistance against which disease?

a. Tuberculosis

b. Malaria

c. Influenza

d. Typhoid

Ans: b.Malaria

Name of the Bundle	Proficient Bundle V2	**Subject**	Competitive Exams Training (Science & Geography)
Topic	Genetics	**Last updated on**	28 March 2025

80. Which test is commonly used to diagnose Sickle Cell Anemia?

a. Complete blood count (CBC)

b. Hemoglobin electrophoresis

c. Blood glucose test

d. Liver function test

Ans: b.Hemoglobin electrophoresis

81. Which treatment is commonly used for severe cases of Sickle Cell Anemia?

a. Antibiotics

b. Chemotherapy

c. Bone marrow transplant

d. Insulin therapy

Ans: c.Bone marrow transplant