

Principles of Inheritance and Variation — Assignment 1

Class 12 Biology · Topic-wise question bank covering every concept of the chapter · Narayan Gurukul Academy

Instructions: (1) Attempt all questions. This worksheet walks through every concept of the chapter, topic by topic.
(2) The interactive MCQ version of these questions (with instant answer reveal) is available on the notes page.
(3) Universal values: $g = 10 \text{ m/s}^2$ unless stated. Give answers with correct SI units.

Mendel's Experiments and Laws of Inheritance

MCQ Questions (choose the correct option)

- Mendel worked on
 - garden pea
 - maize
 - snapdragon
 - fruit fly
- The F₂ phenotypic ratio of a monohybrid cross is
 - 3:1
 - 1:1
 - 9:3:3:1
 - 1:2:1
- The law of segregation is also called the law of
 - purity of gametes
 - dominance
 - independent assortment
 - linkage
- A test cross uses the
 - recessive parent
 - dominant parent
 - F₁
 - F₂

1 Mark Questions

- Why did Mendel choose pea plant?
- State the law of dominance.
- What is a test cross?

2 Mark Questions

- State the law of segregation.
- What are the advantages of pea plant in Mendel's experiments?

3 Mark Questions

- Explain the law of independent assortment.
- State and explain Mendel's three laws of inheritance.

Extensions of Mendelism

MCQ Questions (choose the correct option)

1. Incomplete dominance in snapdragon gives the F1 phenotype
 - (A) pink
 - (B) red
 - (C) white
 - (D) both red and white
2. Co-dominance is seen in the
 - (A) AB blood group
 - (B) O blood group
 - (C) A blood group
 - (D) B blood group
3. Multiple alleles are found in the
 - (A) ABO blood group system
 - (B) pea plant
 - (C) snapdragon
 - (D) Drosophila
4. The number of possible blood groups in humans is
 - (A) four
 - (B) two
 - (C) three
 - (D) six

1 Mark Questions

1. What is incomplete dominance?
2. What is co-dominance?
3. Name an example of multiple alleles.

2 Mark Questions

1. Differentiate between incomplete dominance and co-dominance.
2. How does the ABO blood group show multiple alleles?

3 Mark Questions

1. Describe the extensions of Mendelism with examples.
2. Explain incomplete dominance and co-dominance with examples.

Linkage, Recombination and Sex Determination

MCQ Questions (choose the correct option)

1. Linkage is the tendency of genes to
 - (A) be inherited together
 - (B) separate
 - (C) mutate
 - (D) recombine freely
2. Linkage was explained by

- (A) Morgan
 - (B) Mendel
 - (C) Darwin
 - (D) Watson
3. In humans, the male is
- (A) XY
 - (B) XX
 - (C) XO
 - (D) YY
4. The sex of the child is determined by the
- (A) male parent
 - (B) female parent
 - (C) environment
 - (D) hormones

1 Mark Questions

1. What is linkage?
2. Who explained linkage?
3. What are the sex chromosomes in humans?

2 Mark Questions

1. What is recombination?
2. Describe sex determination in humans.

3 Mark Questions

1. Explain linkage and recombination.
2. Describe the mechanism of sex determination in humans.

Sex-Linked Disorders

MCQ Questions (choose the correct option)

1. Haemophilia is a
 - (A) sex-linked recessive disorder
 - (B) autosomal dominant disorder
 - (C) chromosomal disorder
 - (D) co-dominant trait
2. Colour blindness is more common in
 - (A) males
 - (B) females
 - (C) children
 - (D) adults
3. Sex-linked disorders are carried on the
 - (A) X chromosome
 - (B) autosomes
 - (C) Y chromosome only

- (D) mitochondria
4. A carrier female for haemophilia is
- (A) $X^H X^h$
- (B) $X^H X^H$
- (C) $X^h X^h$
- (D) $X^H Y$

1 Mark Questions

1. What is a sex-linked disorder?
2. Name two sex-linked disorders.
3. Why is colour blindness more common in males?

2 Mark Questions

1. Differentiate between haemophilia and colour blindness.
2. Why do sex-linked disorders affect males more?

3 Mark Questions

1. Explain the inheritance of haemophilia.
2. Describe sex-linked inheritance with examples.

Pedigree Analysis

MCQ Questions (choose the correct option)

1. Pedigree analysis shows the inheritance of a trait across
 - (A) generations
 - (B) cells
 - (C) chromosomes only
 - (D) populations
2. In a pedigree, a circle represents a
 - (A) female
 - (B) male
 - (C) affected male
 - (D) carrier
3. A shaded symbol in a pedigree represents an
 - (A) affected individual
 - (B) unaffected individual
 - (C) carrier
 - (D) twin
4. Pedigree analysis is useful to trace
 - (A) Mendelian traits
 - (B) weather
 - (C) environment
 - (D) habitat

1 Mark Questions

1. What is pedigree analysis?
2. What does a square represent in a pedigree?
3. What does a shaded circle represent?

2 Mark Questions

1. What is the use of pedigree analysis?
2. How is a carrier shown in a pedigree?

3 Mark Questions

1. Explain pedigree analysis with symbols.
2. How is pedigree analysis used to trace a trait?

Chromosomal and Mendelian Disorders

MCQ Questions (choose the correct option)

1. Down's syndrome is caused by
 - (A) trisomy of 21
 - (B) monosomy of X
 - (C) XXY
 - (D) XO
2. Turner's syndrome has the karyotype
 - (A) 45, XO
 - (B) 47, XXY
 - (C) 47, +21
 - (D) 46, XY
3. Klinefelter's syndrome has the karyotype
 - (A) 47, XXY
 - (B) 45, XO
 - (C) 47, +21
 - (D) 46, XX
4. Sickle-cell anaemia is a
 - (A) Mendelian disorder
 - (B) chromosomal disorder
 - (C) sex-linked disorder
 - (D) co-dominant trait

1 Mark Questions

1. What is a chromosomal disorder?
2. What causes Down's syndrome?
3. What is the karyotype in Turner's syndrome?

2 Mark Questions

1. Give two examples of Mendelian disorders.
2. Give two examples of chromosomal disorders.

3 Mark Questions

1. Explain Down's, Turner's and Klinefelter's syndromes.
2. Explain sickle-cell anaemia and its inheritance.