



# BIOLOGY

## BOOKS - SURA BIOLOGY (TAMIL ENGLISH)

### CLASSICAL GENETICS

#### Evaluation

1. Extra nuclear inheritance is a consequence of presence of genes in

A. Mitochondria and chloroplasts

B. Endospermic reticulum and  
mitochondria

C. Ribosomes and chloroplast

D. Lysosomes and ribosomes

**Answer: A::C::D**



**Watch Video Solution**

2. In order to find out the different types of gametes produced by a pea plant having the genotype  $AaBb$ , it should be crossed to a plant with the genotype

A.  $aaBB$

B.  $AaBB$

C.  $AABB$

D.  $aabb$

**Answer: A::B**



Watch Video Solution

3. How many different types of gametes will be produced by a plant having the genotype  $AABbCc$ ?

A. Three

B. Four

C. Nine

D. Two

**Answer:**





Watch Video Solution

4. Which one of the following is an example for polygenic inheritance ?

A. Flower color in *Mirabilis jalapa*

B. Production of male honey bee

C. Pod shape in garden pea

D. Skin color in humans

**Answer: A::C**



Watch Video Solution

5. In Mendel's experiments with garden pea, round seed shape (RR) was dominant over wrinkled seeds (r ), yellow cotyledon (YY) was dominant over green cotyledon (yy). What are the expected phenotypes in the  $F_1$  generation of the cross  $RRYY \times rryy$  ?

- A. Only round seeds with green cotyledons
- B. Only round seeds with yellow cotyledons

C. Only wrinkled seeds with green cotyledons

D. Round seeds with yellow cotyledons and wrinkled seeds with yellow cotyledons

**Answer: A::C::D**



**Watch Video Solution**

**6. Test cross involves**

- A. Crossing between two genotypes with recessive trait
- B. Crossing between two  $F_1$  hybrids
- C. Crossing the  $F_1$  hybrid with a double recessive genotype
- D. Crossing between two genotypes with dominant trait

**Answer: A::B::C::D**



**Watch Video Solution**



7. In pea plants, yellow seeds are dominant to green. If a heterozygous yellow seed plant is crossed with a green seeded plant, what ratio of yellow and green seeded plants would you expect in  $F_1$  generation ?

A. 9: 1

B. 1: 3

C. 3: 1

D. 50: 50

**Answer:**



Watch Video Solution

8. The genotype of a plant showing the dominant phenotype can be determined by

- A. Back cross
- B. Test cross
- C. Dihybrid cross
- D. Pedigree analysis

**Answer: C**



9. Select the correct statements from the ones given below with respect to dihybrid cross

A. Tightly linked genes on the same chromosomes show very few combinations.

B. Tightly linked genes on the same chromosomes show higher combinations.

C. Genes far apart on the same  
chromosomes show very few  
recombinations

D. Genes loosely linked on the same  
chromosome show similar  
recombination as the tightly linked ones

**Answer: A::B::C::D**



**Watch Video Solution**

10. Which Mendelian idea is depicted by a cross in which  $F_1$  generation resembles both the parents.

- A. Incomplete dominance
- B. Law of dominance
- C. Inheritance of one gene
- D. Co-dominance

**Answer: A::C::D**



**Watch Video Solution**

11. Fruit color in squash is an example for

A. Recessive epistasis

B. Dominant epistasis

C. Complementary genes

D. Inhibitory gene

**Answer: A::D**



**Watch Video Solution**

**12.** In his classic experiments on Pea plants, Mendel did not use

A. Flowering position

B. Seed color

C. Pod length

D. Seed shape

**Answer: D**



**Watch Video Solution**

**13.** The epistatic effect, in which the dihybrid cross  $9:3:3:1$  between  $AaBb \times AaBb$  is modified as

A. Dominance of one allele on another allele of both loci.

B. Interaction between two alleles of different loci.

C. Dominance of one allele to another allele of same loci.



D. Interaction between two alleles of some loci.

**Answer: A::B::C::D**



**Watch Video Solution**

**14.** In a test cross involving  $F_1$  dihybrid flies, more parental type offspring were produced than the recombination type offspring. This indicates

- A. The two genes are located on two different chromosomes.
- B. Chromosomes are failed to separate during meiosis.
- C. The two genes are linked and present on the same chromosome.
- D. Both of the characters are controlled by more than one gene.

**Answer: A::C::D**



**Watch Video Solution**

15. The genes controlling the seven pea characters studied by Mendel are known to be located on how many different chromosomes ?

A. Seven

B. Six

C. Five

D. Four

**Answer:**



Watch Video Solution

16. Which of the following explains how progeny can possess the combinations of traits that none of the parents possessed ?

- A. Law of segregation
- B. Chromosome theory
- C. Law of Independent assortment
- D. Polygenic inheritance

**Answer: A::D**



Watch Video Solution

17. 'Gametes are never hybrid'. This is a statement of

- A. Law of dominance
- B. Law of independent assortment
- C. Law of segregation
- D. Law of random fertilization

**Answer: A**



**18.** Gene which suppresses other genes activity but does not lie on the same locus is called as

- A. Epistatic
- B. supplement only
- C. Hypostatic
- D. Codominant

**Answer: A::C**



**19.** Pure tall plants are crossed with pure dwarf plants. In the  $F_1$  generation, all plants were tall. These tall plants of  $F_1$  generation were selfed and the ratio of tall to dwarf plants obtained was 3:1. This is called

- A. Dominance
- B. Inheritance
- C. Codominance
- D. Heredity

**Answer: A::C::D**



**Watch Video Solution**

**20. The dominant epistasis ratio is**

A. 9 : 3 : 3 : 1

B. 12 : 3 : 1

C. 9 : 3 : 4

D. 9 : 6 : 1

**Answer: A::B::C**





Watch Video Solution

21. Select the period for Mendel's hybridization experiments

A. 1856-1863

B. 1850-1870

C. 1857-1869

D. 1870-1877

**Answer: A::C**



22. Among the following characters which one was not considered by Mendel in his experimentation pea ?

- A. Stem-Tall or dwarf
- B. Trichmal glandular or non-glandular
- C. Seed-Green or yellow
- D. Pod-Inflated or constricted

**Answer: A::C::D**



[Watch Video Solution](#)

**23.** Name the seven contrasting traits of Mendel.



[Watch Video Solution](#)

**24.** What is meant by true breeding or purebreeding lines / strain ?



[Watch Video Solution](#)

**25.** Give the names of the scientist who rediscovered Mendelism.



**Watch Video Solution**

**26.** What is back cross ?



**Watch Video Solution**

**27.** Define Genetics.



**Watch Video Solution**

**28.** What are multiple Alleles ?



**Watch Video Solution**

**29.** What are the reasons for Mendel's successes in his breeding experiments?



**Watch Video Solution**

**30.** Explain the law of dominance in monohybrid cross.



**Watch Video Solution**

**31.** Differentiate incomplete dominance and codominance.



**Watch Video Solution**

**32.** What is meant by cytoplasmic inheritance ?



**Watch Video Solution**

**33.** Describe dominant epistasis with an example.



**Watch Video Solution**

**34.** Explain polygenic inheritance with an example.



**Watch Video Solution**

**35.** Differentiate continuous variation with discontinuous variation.



**Watch Video Solution**

**36.** Explain with an example how single genes affect multiple traits and alleles the phenotype of an organism.



**Watch Video Solution**



**37. (a)** Bring out the inheritance of chloroplast gene with on example.

Chloroplast Inheritance



**Watch Video Solution**

## **Additional Questions And Answers**

**1.** Deals with the structure and function of a gene.

**A.** Molecular Genetics

B. Population Genetics

C. Classical Genetics

D. Quantitative

**Answer: A::C**



**Watch Video Solution**

2. Genetics is described as a science which deals with .....

A. Discontinuous variation

B. Continuous variation

C. Hereditv and variation

D. None of the above

**Answer: A::D**



**Watch Video Solution**

**3.** Mendel discovered the principles of heredity by studying the inheritance of ..... pairs of contrasting traits of pea plants.

A. 7

B. 8

C. 10

D. 6

**Answer:**



**Watch Video Solution**

**4.** The term ..... Is the genetic constitution of an individual.

A. Phenotype

B. genotype

C. hybrids

D. alleles

**Answer:**



**Watch Video Solution**

**5.** Gene interaction concept was introduced and explained by ..... .

A. Hugo de Varies

B. Carl correns

C. W. Bateson

D. Erich

**Answer: A::B**



**Watch Video Solution**

6. .... Is a condition in which the death of certain organisms occurs prematurely.

A. Lethality

B. Pleiotropy

C. Hypostatic

D. Epistasis

**Answer: A**



**Watch Video Solution**

7. The activity of the enzyme SBET is lost resulting in .....

A. Round seed

B. Wrinked seed

C. Both round and wrinked seed

D. None of the above

**Answer: D**



**Watch Video Solution**

8. A self fertilizing trihybrid plant forms 8 different gametes and ..... Different zygotes.



A. 64

B. 60

C. 58

D. 46

**Answer: D**



**Watch Video Solution**

**9. Carl Corren's used ..... For his experiment.**

A. 4 O' clock plant

B. Pea plant

C. Pisum sativum

D. Snapdragon

**Answer: C::D**



**Watch Video Solution**

**10. SBEs stands for**

A. Starch Based Enzyme

B. Starch Bound Enzyme

C. Strach Branching Enzyme

D. Strach Bilayer Enzyme

**Answer: A::B::C**



**Watch Video Solution**

**11. RR yy is .....**

A. Dominant

B. Recessive

C. Homozygous

D. Heterozygous

**Answer: A**



**Watch Video Solution**

**12.** In peas ..... Is dominant trait with respect to pod colour

A. Purple

B. Green

C. White

D. Yellow

**Answer:**



**Watch Video Solution**

**13.** The gene for tall pea plant is related with

.....

A. apical dominance

B. gibberellins

C. Auxins

## D. Dwarfism

**Answer: B**



**Watch Video Solution**

**14. Identify the back cross**

A.  $T \times$

B.  $Tt \times$

C.  $Tt \times Tt$

D.  $Tt \times T$

**Answer: B**



**Watch Video Solution**

**15. Incomplete dominance was reported in ....**

A. Mirabilis

B. Wheat

C. Tobacco

D. Cucurbita

**Answer: A::B**



[Watch Video Solution](#)

16. Sickle cell anaemia is related to .....

A. Pleiotropy

B. Dominant epistasis

C. Incomplete dominance

D. codominance

**Answer:**



[Watch Video Solution](#)



17. In the ratio 12:3:1 in summer squash for fruit colour, 12 stands for

A. yellow fruits

B. green fruits

C. white fruits

D. none on the above

**Answer:**



**Watch Video Solution**

**18.** The ratio ..... is seen in inhibitory gene interaction.

A. 9:7

B. 9:3:4

C. 13:3

D. 9:6:1

**Answer:**



**Watch Video Solution**

19. ABO blood group in human is an example of

A. co dominance

B. incomplete dominance

C. dominant epistasis

D. complementary gene interaction

**Answer: A::C::D**



**Watch Video Solution**

**Choose The Correct Statements**

1. Identify the correct statement(s) from the below

i) Monohybrid inheritance is the inheritance of a single character.

ii) It involves the inheritance of two alleles of a single gene.

iii) It involves individuals differing in two characters.

iv) It is the inheritance of two separate genes.

A. I,II and III

B. I and II

C. I,II and IV

D. II, III and IV

**Answer: B**



**Watch Video Solution**

## 2. 'Discontinuous Variation'

The characteristics controlled by one or two major genes.

They have allelic form.

Variations are genetically determined by inheritance factors.

Also known as quantitative inheritance.

A. I and III

B. II and III

C. I,II and IV

D. II, III and IV

**Answer: A::D**



**View Text Solution**

### 3. 'Trihybrid Cross'

Cross between homozygous parents that differ in three pairs of contrasting characters.

It forms 8 different gametes and 64 different zygotes.

Single phenotype is controlled by more than one set of genes.

It demonstrates the Mendel's laws are applicable to the inheritance of multiple traits.

A. I and III

B. I and II

C. I,II and Iv

D. II,III and IV

**Answer: A::D**



**Watch Video Solution**

4. Discontinuous variation is also called quantitative inheritance.

Continuous variation is also called qualitative inheritance.

Variation is the raw material for evolution.



Variation provides genetic material for natural selection.

A. I and III

B. III and IV

C. I,II and III

D. II,III and IV

**Answer: B**



**Watch Video Solution**

**Choose The Incorrect Statements**

1. Choose the incorrect statement : "polygenic inheritance"

A. Occurs when one characteristic is controlled by two or more genes.

B. Group of genes determine a characteristic of an organism.

C. Gene interaction with two alleles.

D. IT was demonstrated by H. Nilsson-Ehle.

**Answer: A::B::C::D**



Watch Video Solution

2. Identify the wrong statement from the below about "cytoplasmic inheritance"

A. Chloroplast acts as inheritance vector.

B. Mitochondrion acts as inheritance vector.

C. Normal cytoplasm is male fertile.

D. Aberrant cytoplasm is female fertile.

**Answer: D**



**Watch Video Solution**

**3. Identify the wrong statement from the below**

A. Mendel's monohybrid ratio is 9 : 3 : 3 : 1

B. Reciprocal differences found in *Mirabilis jalapa*.

C. RF genes are required to restore fertility  
in pearl maize.

D. Test cross determines the genotype of  
an individual.

**Answer: A**



**Watch Video Solution**

**Assertion And Reason**

1. Assertion (A): Genetics is described as a science which deals with heredity.

Reason (R ): Heredity is the transmission of characters from parents to offsprings.

A. Assertion is true and Reason is correct explanation of Assertion.

B. Assertion and Reason is true but Reason is not correct explanation of Assertion.

C. Assertion is true and Reason is false.

D. Both Assertion and Reason are false.

**Answer:**



**Watch Video Solution**

2. Assertion (A): Variations help the individuals to adapt themselves to the changing environment.

Reason (R ) : It provides the genetic material for natural selection.

A. Assertion is true and Reason is correct explanation of Assertion.

B. Assertion and Reason is true but Reason is not correct explanation of Assertion.

C. Assertion is true and Reason is false.

D. Both Assertion and Reason are false.

**Answer:**



**Watch Video Solution**

**3. Assertion (A):** Monohybrid inheritance is the inheritance of a single character.



Reason (R ) : It involves the inheritance of single allele of a single gene.

A. Assertion is true and Reason is correct explanation of Assertion.

B. Assertion and Reason is true but Reason is not correct explanation of Assertion.

C. Assertion is true and Reason is false.

D. Both Assertion and Reason are false.

**Answer:**



**Watch Video Solution**

## Choose The Correct Pair

1. 



[View Text Solution](#)

2. 



[View Text Solution](#)

# Choose The Incorrect Pair

1. 



[View Text Solution](#)

2. 



[View Text Solution](#)

3. 





[View Text Solution](#)

4.



[View Text Solution](#)

## Answer In One Word

1. Who introduced the term genetics.....



[Watch Video Solution](#)

2. Functional units of inheritance....



[Watch Video Solution](#)

3. Transmission of characters from parents to offspring .....



[Watch Video Solution](#)

4. \_\_\_\_\_ is the father of Genetics.



[Watch Video Solution](#)

5. Title of paper submitted by Mendel .....



**Watch Video Solution**

6. Removal of stamens from a flower to facilitate cross pollination



**Watch Video Solution**

7. Name used for genes by Mendal .....



**Watch Video Solution**

8. Pigment responsible for purple colour of pea flowers .....



[Watch Video Solution](#)

9. Alternate forms of a gene .....



[Watch Video Solution](#)

**10.** The term ..... Is the genetic constitution of an individual.



**Watch Video Solution**

**11.** Methods to analyse the result of crosses in genetics .....



**Watch Video Solution**



**12.** Cross involving an unknown genotype and recessive parent .....



**Watch Video Solution**

**13.** Genotypic ration of monohybrid cross



**Watch Video Solution**

**14.** What does SBEI stand for .....



**Watch Video Solution**

**15.** Who demonstrated incomplete dominance for the first time .....



**Watch Video Solution**

**16.** Pattern of inheritance in which both alleles are expressed.....



**Watch Video Solution**

17. An allele which causes death of an organism .....



[Watch Video Solution](#)

18. In which plant was a lethal allele reported for the first time .....



[Watch Video Solution](#)

19. A phenomenon in which a single gene affects multiple traits \_\_\_\_\_

A. Co-dominance

B. Incomplete dominance

C. Segregation

D. Pleiotropy

**Answer: D**



**Watch Video Solution**

20. Example of a disease caused by a pleiotropic gene .....



**Watch Video Solution**

21. Type of gene interaction involved in inheritance of fruit colour in summer squash .....



**Watch Video Solution**

22. Type of inheritance involved in kernal colour of wheat .....



**Watch Video Solution**

23. Type of inheritance in cytoplasmic male sterility in maize .....



**Watch Video Solution**

24. Reappearance of ancestral trait after being lost in previous generations .....



[Watch Video Solution](#)

25. A plant character showing chloroplast inheritance .....



[Watch Video Solution](#)

**Very Short Answers**

1. What is genotype ?



**Watch Video Solution**

2. What is phenotype ?



**Watch Video Solution**

3. What are the classification of gene interactions ?



**Watch Video Solution**



4. What is incomplete dominance? Give an example.



[Watch Video Solution](#)

5. Mendel's last law is

A. Segregation

B. Dominance

C. Independent Assortment

## D. Polygenic Inheritance

**Answer: C**



**Watch Video Solution**

**6. What is test cross ? Why it is done ?**



**Watch Video Solution**

**7. What is molecular genetics ?**



**Watch Video Solution**

**8. Define population genetics.**



**Watch Video Solution**

**9. Define quantitative genetics.**



**Watch Video Solution**

**10. What are factors ?**



**Watch Video Solution**

**11. Define lethal allele**



**Watch Video Solution**

**12. What is gene interaction?**



**Watch Video Solution**

**13. What is the role of pea gene A ?**



**Watch Video Solution**

**14. What are alleles ?**



**Watch Video Solution**

**15. Define Genetics.**



**Watch Video Solution**

**16. What do you mean heredity ?**



**Watch Video Solution**

**17.** State the law of independent assortment.



**Watch Video Solution**

**18.** Mention the four types of resultants of dihybrid cross.



**Watch Video Solution**

**19.** What is codominance?



**Watch Video Solution**

**20.** Write a note on pleiotropy.



**Watch Video Solution**

**21.** Explain polygenic inheritance with an example.



**Watch Video Solution**

22. Give the two example for non-allelic/intergenic interaction with example



[Watch Video Solution](#)

23. Write a short note on Atavism.



[Watch Video Solution](#)

**Short Answers**



1. Define transmission genetics.



[Watch Video Solution](#)

2. What is continuous variation?



[Watch Video Solution](#)

3. Write a short note on cytoplasmic male sterility in pearl maize.



[Watch Video Solution](#)

4. Mendel proposed two rules based on his observation on monohybrid cross. What are they ?



**Watch Video Solution**

5. What is empirical approach and empirical law ?



**Watch Video Solution**

6. Explain about the importance of variation ?



[Watch Video Solution](#)

7. Why Mendel selected garden pea plant for his hybridisation experiments ?



[Watch Video Solution](#)

8. State and explain the law of purity of gametes.





[Watch Video Solution](#)

9. Draw a flowchart to show different types of gene interactions.



[Watch Video Solution](#)

10. What is a checker board or Punnett square?



[Watch Video Solution](#)

11. What is a dihybrid cross ?



[Watch Video Solution](#)

## Long Answers

1. Give an account of Codominance (1 : 2 : 1)



[Watch Video Solution](#)

2. Why Mendel's pea plants are tall and dwarf ?

Find out the molecular explanation.



**Watch Video Solution**

**3. Write a short note on Atavism.**



**Watch Video Solution**

**4. Explain Dihybrid cross in pea plant .**



**Watch Video Solution**

5. What is incomplete dominance? Give an example.



[Watch Video Solution](#)

6. Explain the molecular basis for occurrence of white flowers in peas.



[Watch Video Solution](#)

7. Explain the significance of test cross.



Watch Video Solution

## Unit Test

1. Deals with the structure and function of a gene.

A. Molecular Genetics

B. Population Genetics

C. Classical Genetics

D. Quantitative Genetics



**Answer:**



**Watch Video Solution**

2. Select the correct statements from the ones given below with respect to dihybrid cross

A. Tightly linked genes on the same chromosomes show very few combinations.

B. Tightly linked genes on the same chromosomes show higher combinations.

C. Genes far apart on the same chromosomes show very few recombinations

D. Genes loosely linked on the same chromosome show similar recombination as the tightly linked ones

**Answer:**



Watch Video Solution

3. In a test cross involving  $F_1$  dihybrid flies, more parental type offspring were produced than the recombination type offspring. This indicates

A. The two genes are located on two different chromosomes.

B. Chromosomes are failed to separate during meiosis.

C. The two genes are linked and present on the same chromosome.

D. Both of the characters are controlled by more than one gene.

**Answer:**



**Watch Video Solution**

4. Identify the correct statement(s) from the below

i) Monohybrid inheritance is the inheritance of

a single character.

ii) It involves the inheritance of two alleles of a single gene.

iii) It involves individuals differing in two characters.

iv) It is the inheritance of two separate genes.

A. I, II and III only

B. I and II only

C. I, II and IV only

D. II, III and IV only

**Answer: B**



[Watch Video Solution](#)

5. The polygenic gene shows

- A. different karyotypes
- B. different genotypes
- C. different phenotypes
- D. none of these

**Answer: C**



[Watch Video Solution](#)

6. A family of five daughter only is expecting sixth issue. The Chance of its beings a son is

A. zero

B. 25%

C. 50%

D. 100%

**Answer: C**



**Watch Video Solution**

7. Assertion (A): Monohybrid inheritance is the inheritance of a single character.

Reason (R ) : It involves the inheritance of single allele of a single gene.

A. Both assertion and reason are true. But reason is correct explanation of assertion.

B. Assertion is false but reason is true.

C. Both assertion and reason are true.

D. Assertion is true but reason is false.



**Answer:**



**Watch Video Solution**

8. .... Is used to identify whether an individual is homozygous or heterozygous for dominant character.

- A. Back Cross
- B. Test Cross
- C. Dihybrid Cross
- D. Reciprocal Cross

**Answer: B**



**Watch Video Solution**

**9. Choose the incorrect pair.**

A. Gene interaction - W. Bateson

B. Codominance - Electrophoresis

C. Polygenic inheritance - Hugo de Varies

D. Lethality - Death of genotype

**Answer:**



[Watch Video Solution](#)

## Unit Test Very Short Answer

1. What is meant by true breeding or purebreeding lines / strain ?



[Watch Video Solution](#)

2. Define alleles.



[Watch Video Solution](#)

## Unit Test Short Answer

1. which of the following is not a hereditary disease?

A. Cystic fibrosis

B. Thalassaemia

C. Haemophilia

D. Cretinism

**Answer: D**



[Watch Video Solution](#)

2. What are the reasons for Mendel's successes in his breeding experiments?



[Watch Video Solution](#)

## Unit Test Long Answer

1. What is incomplete dominance? Give an example.



**Watch Video Solution**