



# BIOLOGY

## BOOKS - PREMIERS PUBLISHERS

### CLASSICAL GENETICS

#### Evaluation Textbook Questions Answers

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

A. Mitochondria and chloroplasts

B. Endoplasmic reticulum and  
mitochondria

C. Ribosomes and chloroplast

D. Lysosomes and ribosomees

**Answer: A**



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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: D**



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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: D**





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

A. flower colour in *Mirabilis jalapa*

B. Production of male honey bee

C. Pod shape in garden pea

D. Skin colour in humans

**Answer: D**



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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 wrinkled seeds with yellow cotyledons

C. Only wrinkled seeds with green cotyledons

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

**Answer: D**



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**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: C**



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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: D**



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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: B**



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

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

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

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

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

**Answer: A**



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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: D**



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11. Fruit color in squash is an example for

A. Recessive epistatsis

B. Dominant epistasis

C. Complementary genes

D. Inhibitory genes

**Answer: B**



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

A. Flowering position:

B. Seed colour

C. Pod length

D. Seed shape

**Answer: B**



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**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 alleles of same loci



D. Interaction between two alleles of some loci

**Answer: B**



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

**Answer: C**



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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: A**



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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. Chromosomes theory
- C. Law of independent assortment
- D. Polygenic inheritance

**Answer: C**



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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: C**



**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**



**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**



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**20. The dominant epistasis ratio is**

A. 9 : 3 : 3 : 1

B. 12 : 3 : 1

C. 9 : 3 : 4

D. 9 : 6 : 1

**Answer: B**





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**21.** Select the period for Mendel's hybridization experiments

A. 1856-1863

B. 1850-1870

C. 1857-1869

D. 1870-1877

**Answer: A**



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

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

**Answer: B**



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



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



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



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**26.** What is back cross ?



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**27.** Define Genetics.



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**28.** What are multiple alleles?



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



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



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



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



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



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



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



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



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

Chloroplast Inheritance



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**Other Important Questions Answers 1 Choose  
The Correct Answers 1 Mark**

1. Match the following:

(p) Genotype	(i) Heterozygous
(q) Phenotype	(ii) Identical alleles
(r) Hybrids	(iii) Genetic constitution
(s) Homozygous	(iv) Observable character

A. p-iv, q-iii, r-ii, s-i

B. p-iii, q-iv, r-i, s-ii

C. p-iii, q-ii, r-iv, s-i

D. p-ii, q-i, r-iv, s-iii

**Answer: B**





2. Match the following:

Character	Gene
(p) Plant height	(i) Fa
(q) Pod colour	(ii) A
(r) Flower position	(iii) GP
(s) Flower colour	(iv) Le

- A. p-iv, q-iii, r-l, s-ii
- B. p-iv, q-iii, r-ii, s-i
- C. p-iii, q-iv, r-l, s-ii
- D. p-ii, q-l, r-iv, s-l

**Answer: A**



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**3. Match the following:**

(p) E. Baur	(i) Blending inheritance
(q) Carl Correns	(ii) Father of Genetics
(r) Nilsson-Ehle	(iii) Lethal genes
(s) Gregor Johann Mendel	(iv) <i>Mirabilis jalapa</i>

A. p-iv, q-iii, r-ii, s-i

B. p-iv, q-iii, r-I, s-ii

C. p-iii, q-iv, r-I, s-ii

D. p-ii, q-l, r-iv, s-iii

**Answer: C**



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**4. Match the following:**

<i>(p)</i> Dominant epistasis	<i>(i)</i> Pea plants
<i>(q)</i> Codominance	<i>(ii)</i> Summer squash
<i>(r)</i> Pleiotropy	<i>(iii)</i> <i>Sorghum</i>
<i>(s)</i> Mitochondrial inheritance	<i>(iv)</i> <i>Camellia</i>

A. p-iv, q-iii, r-ii, s-i

B. p-ii, q-l, r-iv,s-iii

C. p-iii, q-l, r-iv, s-ii

D. p-ii, q-iv, r-l,s-iii

**Answer: D**



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**5. Choose the odd man out:**

A. Phenotype

B. Homozygous

C. Heterozygous

D. Allele

**Answer: A**



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**6. Choose the odd one out:**

A. Complete dominance

B. Lethal genes

C. Multiple alleles

D. Epistatic

**Answer: D**



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7. Identify the odd man out:

A. Hugo de Vries

B. Linnacus

C. Carl Correns

D. Erich Von Tschermak



**Answer: B**



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**8. Choose the odd one out:**

A. Codominance

B. Complementary

C. Supplementary

D. Inhibitory

**Answer: A**



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**9. Choose the correct pair.**

Column - I	Column - II
(a) Flower colour	Green
(b) Flower position	Constricted
(c) Seed Shape	Terminal
(d) Pod form	Inflated



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10. Find out the incorrect pair:

Column - I	Column - II
(a) Dwarf Pea plants	homozygous recessive
(b) Heterozygous	hybrids
(c) Dominant epistasis	4 O'Clock plant
(d) Pleiotropy	Sickle cell anemia



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11. Choose the correct pair.

Column - I	Column - II
(a) Human skin colour	Complementary
(b) Human height	Polygenic
(c) Phenylketonuria	Supplementary
(d) Male Sterility	Inhibitory



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12. Find out the incorrect pair.

Column - I	Column - II
(a) Multiple alleles	Allelic inactions
(b) Lethal genes	<i>Antirrhinum</i> sp
(c) Pleiotropy	Polygenic
(d) Chloroplast gene	<i>Mirabilis jalapa</i>



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13. Male sterility in pearl maize is due to:

- A. Independent inheritance
- B. Mitochondrial inheritance
- C. Chloroplast gene inheritance
- D. Codominance

**Answer: B**



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14. The polygenic inheritance was first demonstrated by:

A. E.Baur

B. Carl Correns

C. Hugo de Vries

D. H.Nilson - Ehle

**Answer: D**



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15. The dominant epistasis ratio is

A. 9:3:3:1

B. 12:3:1

C. 9:7

D. 15:1

**Answer: B**



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**16.** In Polygenic inheritance the production of medium dark red colour is due to:

- A. Four R genes
- B. Two R genes
- C. Three R genes
- D. Absence of R-gene

**Answer: C**



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17. Intra-genic interaction includes:

A. Dominant epistasis

B. Duplicate genes

C. Inhibitor genes

D. Codominant genes

**Answer: D**



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**18.** The gene that suppresses or masks the phenotypic expression of a gene at another locus is.

A. Assertion is true, Reason is wrong.

B. Assertion is wrong, Reason is true.

C. Both Assertion and Reason are true

D. Both Assertion and Reason are wrong.

**Answer: C**



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**19. Assertion:** The phenomenon in which two alleles both expressed in the heterozygous condition is known as codominance.

**Reason:** The codominance was demonstrated in plants with the help of electrophoresis.

- A. The assertion is true, the reason is false.
- B. the assertion is false, the reason is true.
- C. both assertion and reason are true
- D. Both assertion and reason are false.

**Answer: A**



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**20.** Assertion: In monohybrid cross, when two homozygous dominant and recessive traits and crossed, an intermediate character is found in  $F_1$  generation.

Reason: This may be due to codominance of two alleles.

- A. Assertion is right, the reason is wrong.
- B. Assertion is false, the reason is true.
- C. Both assertion and Reason are true.

D. Both Assertion and Reason are false.

**Answer: D**



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21. Which of the following statements is correct?

A. The dihybrid cross involves individuals differing in one character.

B. The recessive back cross helps to identify the homozygosity of the hybrid.

C. The dihybrid cross is a genetic cross in which individuals differing in two characters are involved.

D. None of the above statement is correct.

**Answer: C**



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22. Choose the incorrect statement

A. Two identical alleles of a gene is called heterozygous

B. Two different alleles of a gene is called heterozygous.

C. Two identical alleles of a gene is called homozygous.

D. An individual with two dominant alleles is called homozygous dominant.

**Answer: A**



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**23.** Find out the correct statement.

A. Mendelian experiments prove that a single gene controls more than one character.

B. Independent assortment leads to genetic diversity.



C. Back cross involves the cross between the  $F_2$  offspring with  $F_1$  parents.

D. Independent assortment leads to genetic homozygosity.

**Answer: B**



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**24. Which of the following statements is false?**

- A. Intragenic gene interaction takes place between the alleles of the same gene.
- B. Intragenic gene interaction takes place between the alleles at the same locus.
- C. Intergenic gene interaction takes place between alleles of different locus.
- D. All the above statements are wrong.

**Answer: D**



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**25.** Choose the correct statement

A. Codominance type of inheritance is found in snap dragon.

B. The inheritance of sickle cell anemia is the typical example of pleiotropy.

C. Polygenic inheritance is seen in the flower colour of pea plants.

D. The expressions of inhibitor gene leads to male sterility in plants.

**Answer: B**



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**Other Important Questions Answers li Answer  
The Following**

**1. Define heredity.**



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**2. Define variation.**



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3. Give the names of the scientists who rediscovered mendel's work.



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4. What is back cross ?



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5. Define monohybrid cross.



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6. What is genotype ?



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7. List any three traits of pea plant selected by Mendel for his experiments and mention their dominant & recessive form.



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**8. What is codominance?**



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**9. Write a note on pleiotropy.**



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**10. Explain briefly dominant Epistasis.**



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**11.** Give two examples of Inter-genic interaction.



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**12.** Mention any two examples of Incomplete dominance.



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**13. Define Lethal genes.**



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**14. Mention any two types of lethal genes.**



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**15. What is molecular genetics ?**



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## Other Important Questions Answers iii Answer The Following

1. Distinguish between population genetics and quantitative genetics.



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2. what is discontinuous variation?



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3. Explain Mendel's law of heredity.



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4. What are the types of dominant relationships.



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5. Distinguish between intragenic and intergenic gene interactions.



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6. List out three plants, that exhibit co-dominance.



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7. Mention three examples of non-allergic interactions.



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8. Give three examples of polygenic inheritance.



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9. What is polygenic inheritance?



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10. What are extra chromosomal inheritance ?

Explain with an example .





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## Other Important Questions Answers Iv Anser The Followin 5 Marks

1. What is empirical approach and empirical law ?



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2. Define test cross. Explain it with an example.



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3. What is the molecular for Mendel's tall and dwarf plants?



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4. Tabulate examples of Inter-genic interaction with their  $F_2$  ratio.



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