BIOLOGY

BOOKS - FULL MARKS BIOLOGY (TAMIL ENGLISH)

CLASSICAL GENETICS

Textual Questions Solved

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

A. Mitrochondria and chloroplasts

B. Endoplasmic reticulum and mitrochondria

C. Ribosomes and chloroplast

D. Lysosomes and ribosomes

Answer: A

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2. In order to find out the diferent 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 AABbC C ?

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 male haney 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 an 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 between two F_1 hybrids 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 pant is crossed with a green seeded plant, what ratio of yellow and green seeded plants would you expect in F, generation?

A. $9:3$

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

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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 chromosomes show similar recombinations 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 epistasis

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: C

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

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

B. Interaction between two alleles of different loci

C. Dominance of one allele to another allel 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 off spring. 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 some chromosome

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 posses the combinations of traits that none of the parent possessed ?

A. Law of segregation

B. Chromosomes theory

C. Low of independent assortment

D. Polygenic inheritance

Answer: D

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

A. Law of dominance

B. Low of independent assortment

C. Law of segregation

D. Law of random fertilization

Answer: C

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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: C

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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

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

A. Stem - Tall or dwarf

B. Trichomal glandular or non - glandular

C. Seed - Green or yellow

D. Pod - Inflated or constricted

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 continous variation with discontinous 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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Additional Questions 1 Mark Questios

1. The term 'Genetics' was introduced by .....

A. a) Gregor Mendel

B. b) Bateson

C. c) Hugo de Vries

D. d) Carl Correns

Answer: B

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2. Which is not a correct statements ?

(A) Variations are the raw materials for evolution

(B) Variations provide genetic material for natural selection

(C) It helps the individual to adapt to changing environment

(D) Variations allow breeders to improve the crop field

A. A and D

B. B only

C. C and D

D. none of the above

Answer: D

3. The process of removal of anthers from the flower is called .....

4. An allele is .....

A. another word for a gene

B. Alternate forms of a gene

C. morphological expression of a gene

D. genetic make up of an organism

Answer: B

5. Gregor Mendel .....

(i) was born in Czechoslovakia

(ii) did his experiments in Pisum fulvum

(iii) was the first systemic researcher in genetics

(iv) Published his results in the paper " Experiments on Plant Hybrids "

A. a) All are correct

B. b) (ii), (iii) , (iv) are correct

C. c) (i), (iii) , (iv) are correct

D. d) (i) , (iii) , (iv) are correct

Answer:

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6. Match the following

Column I	Column II
(A) cotyledon color	(i) Inflated /Constricted
(B) Flower color	(ii) Green /Yellow
(C) Seed shape	(iii) Round /wrinkled
(D) Pod shape	(iv) Purple /White

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7. How many characters studied by Mendel in pisum sativum

A. Three

B. Five

C. Seven

D. Nine

Answer: C

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8. Mendel's work were rediscovered by .....

A. Hugo de Vries

B. Tschermak

C. Carl Correns

D. all the above

Answer: D

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9. Crossing of F_1 to any one the parent refers to .....

A. selfing

B. back cross

C. test cross

D. all of the above

Answer: B

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10. Match the following

Gene interactions	F_2 Phenotype ratio
(A) Complementary genes	$(i) 1:2:1$
(B) Supplementary genes	$(ii) 9:7$
(C) Co - dominance	$(iii) 15:1$
(D) Duplicate genes	$(iv) 9:3:4$

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11. In an intergenic interaction , the gene that suppresses the pherotype of a gene is said to be.....

A. Dominant

B. Inhibitory

C. Epistatic

D. Hypostatic

Answer: C

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12. Assertion (A) : Test cross is done between F_2 hybrid with F_1 recessive

Reason (R) : It helps to identify the homozygosity of hybrids.

A. A and R are correct R explains A

B. A and R are incorrect

C. A is correct R is incorrect

D. A is incorrect R is correct

Answer: B

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13. Assertion (A) : Codominace is an example for intragenic interaction

Reason (R) : Interaction take place between the alleles of same gene

A. A and R are correct R explains A

B. A and R are incorrect

C. A is correct R is incorrect

D. A is incorrect R is correct

Answer: A

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14. Assertion (A) : Pleiotropic gene affects multiple traits

Reason (R) : ABO blood group is an example for Pleiotropism

A. A and R are correct R explains A

B. A and R are incorrect

C. A is correct R is incorrect

D. A is incorrect R is correct

Answer: C

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15. Assertion (A) : Cytoplasmic male sterility is a Mendelian inheritance

Reason (R) : The genes for cytoplasmic male sterility in peal maize is located at mitochondrial DNA

A. A and R are correct R explains A

B. A and R are incorrect

C. A is correct R is incorrect

D. A is incorrect R is correct

Answer: D

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16. What is the phenotypic ratio in case of incomplete dominance

A. $9:7$

B. $3:1$

C. $1:2:1$

D. $1:1:1:1$

Answer: C

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17. Identify the mismatched pair

A. Chloroplast inheritance - Gregor Mendel

B. Polygenic inheritance - H. Nilsson

C. Lethal genes - E. Baur

D. Incomplete dominance - Carl Correns

Answer: A

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18. Statement 1 : Intergenic gene interaction occurs between alleles at same locus

Statement 2 : Co - dominance is an example for intergenic gene interaction

A. Statement 1 is correct & Statement 2 is incorrect

B. Statement 1 is incorrect & Statement 2 is correct

C. Both Statements 1 & 2 are correct

D. Both Statements 1 & 2 incorrect

Answer: C

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19. Statement 1 : Test cross is done between F_1 individual with homozygous recessive

Statement 2 : If F_1 individual is homozygous , the rate of a monohybrid cross will be 1 : 1

A. Statement 1 is correct & Statement 2 is incorrect

B. Statement 1 is incorrect & Statement 2 is correct

C. Both Statements 1 & 2 are correct

D. Both Statements 1 & 2 incorrect

Answer: A

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20. Identify the incorrect statement

A. In incomplete dominance , the traits are blended not the genes

B. Incomplete dominance is noticed in Mirabilis jalapa by Carl Correns

C. It is a type of Intragenic gene interaction

D. Incomplete dominance F_2 ratio is 1 :3 : 1

Answer: D

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21. In case of co - dominance , monohybrid F_1 .....is 1 : 2 : 1

A. Genotype ratio

B. Phenotype ratio

C. Both genotype & Phenotype ratio

D. Ratio is wrong

Answer: C

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22. Identify the wrong statement (s)

(i) Monohybrid cross involves the inheritance of two alleles of a gene

(ii) The dwarf traits reappeared in F_2

(iii) Law of dominance was proved by monohybrid cross

(iv) F_1 monohybrid was an heterozygous

A. i and ii

B. iii and iv

C. i only

D. none of the above

Answer: D

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23. Result of incomplete dominance is .....

A. Intermediate genotype

B. Intermediate phenotype

C. Recessive phenotype

D. Epistasis

Answer: B

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24. Heterozygous Tall mono hybrid is cross with homozygous recessive . What will be characteristic of offspring ?

A. a) 25% recessive 75% dominant

B. b) 75% recessive 25% dominant

C. c) 50% recessive 50% dominant

D. d) All are dominants

Answer: C

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25. ABO blood group in human is an example of

A. Polygenic inheritance

B. Incomplete dominance

C. Epistasis

D. Dominance

Answer: D

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26. RR (Red) flower of Mirabilis is crossed with White (WW) flowers. Resultant offspring are pink RW . This is an example of .....

A. Epistasis

B. Co - dominance

C. Incomplete dominance

D. Pleiotropism

Answer: C

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27. How many genetically different gametes are produced by a plant have genotype TtYyRr ?

A. a) 2

B. b) 4

C. c) 6

D. d) 8

Answer: D

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28. When a single gene influences multiple traits then the phenomenon is called .....

A. Pleiotropy

B. Polygenic inheritance

C. Epistasis

D. Atavism

Answer: A

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29. According to Mendel, which is not a dominant trait ?

A. Yellow flower color

B. Yellow cotyledon color

C. Wrinkled seeds

D. Inflated pod

Answer: D

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30. Ratio of recessive epistasis is .....

A. $12:3:1$

B. $9:7$

C. $9:3:4$

D. $9:6:1$

Answer: C

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31. According to Mendel, which is not a dominant trait ?

A. Wrinkled seeds

B. Purple flower

C. Inflated pod form

D. Axial flower portion

Answer: A

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32. Identify the allelic interaction

A. Dominant epistasis

B. Co - dominance

C. Recessive epistasis

D. Duplicate genes

Answer: B

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33. 'Gametes are never hybrid". This is a statement of

A. Law of dominance

B. Low of segregation

C. Law of independent environment

D. Law of lethality

Answer: B

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34. Factor hypothesis was proposed by .....

A. Reginald Punnett

B. W. Bateson

C. Gregor Mendel

D. Carl Correns

Answer: B

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35. The 1 : 2 : 1 ratio of co - dominance process Mendel's .....

A. Law of dominance

B. Law of recessiveness

C. Law of segregation

D. Law of independent assortment

Answer: B

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36. Match the following :

Epistatic interaction	Example
(A) Complementary genes	(i) Seed capsule in xxxxx
(B) Supplementary genes	(ii) Leaf color in rice plant
(C) Inhibitory genes	(iii) Grain color in maize
(D) Duplicate genes	(iv) Flower color in sweet peas

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Additional Questions 2 Mark Questios

1. Who coined the term genetics ? Also define it.

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2. Name the four major subdisciplines of genetics.

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3. Define heredity & variation.

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4. Mendel's theory is a particulate theory - justify.

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5. The number of contrasting characters chosen by Mendel for his experiments.

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6. Name any four characters of pisum sativum that was studied by Mendel.

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7. Define the following terms (i) Emasculation (ii) Alleles (iii) Phenotype

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8. Name the first and second law of Mendel.

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9. What is genotype & phenotype ?

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10. Write the phenotypic and genotypic ratio of monohybrid cross.

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11. What is test cross ? Why it is done ?

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12. State the law of independent assortment.

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13. Give the phenotypic ratio of (a) Dihybrid cross (b) Dihybrid test cross

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14. Read the cross and answer the following

RrYy (F1 hybrid) $\times$ rryy (recessive parent)

(a) Name the type of cross .

(b) Mention the ratio of the cross.

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15. How many types of gametes are produced by a dihybrid plant. If the same plant is self fertilized , how many second generation offspring are developed ?

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16. Write the phenotypic and genotypic ratio of monohybrid cross.

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17. Define gene interaction.

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18. Classify gene interactions with an example.

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19. Provide any four intergenic gene interactions.

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20. Define intragenic interaction

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21. In which plant does the incomplete dominance was studied by Carl Correns? Write the ratio of the cross.

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22. What are lethal alleles ? Give example.

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23. Give the proper terminologies for the following statement (a) Single gene affecting multiple traits (b) Single trait affected by many genes .

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24. What is intergenic gene interactions ? Give example.

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25. What is meant by cytoplasmic inheritance ?

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26. What are plasmogenes?

Watch Video Solution

27. What is meant by cytoplasmic inheritance ?

Watch Video Solution

28. Extranuclear inheritance is called as cytoplasmic inheritance. Why ?

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29. What is cytoplasmic male sterility ?

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Additional Questions 3 Mark Questios

1. Point out any three importance of variations.

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2. Why did Mendel select pea plant for this experiments?

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3. State the law of segregation.

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4. How many types of gametes are produced by heterozygous dihybrid plant with a genotype RrYy ? Write them .

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5. Define trihybrid cross. Mention its F_2 phenotypic ratio.

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6. Define co-dominance. How it is proved by using Gossypium species?

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7. Give an account on cytoplasmic male sterility .

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8. Write a short note on Atavism.

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Additional Questions 5 Mark Questios

1. Explain Dihybrid cross in pea plant .

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2. How does the wrinkled gene make Mendel's peas wrinkled? Find out the molecular explanation.

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3. Differentiate incomplete dominance and codominance.

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Higher Order Thinking Skills Hots Questions

1. A yellow colour flower plant indicated by YY is crossed with white color flower plant denoted by yy.

(a) following the Mendelian inheritance pattern , what would be the flower color is first filial generation ?

(b) Which Mendelian principle is illustrated in this cross ?

(c) Derive the cross and state the phenotypic ratio of yellow flowers to white flowers in F_2 generation ?

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2. Mala is a genetic research student . She was given a plant to identify whether it is a homozygous or heterozygous for a particular trait. How will she proceed further ?

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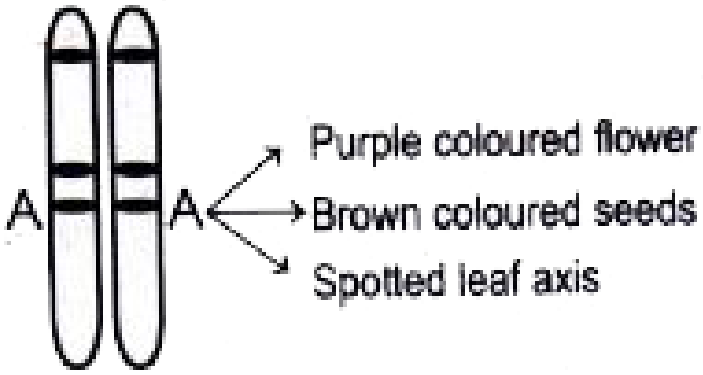
3. In the chart given below , 'AA, are the genes in a chromosome of Pisum sativum.



Observe the chart and mention the genetic phenomenon does it indicates.

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4. Write the F_2 phenotypic ratio of (i) Recessive epistasis (ii) Duplicate genes

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5. Name the respective pathern of inheritance where F_1 phenotype

a) Resembles any one of the two parents

b) is an intermediate between two parental traits .

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