

Principles of Inheritance and Variation

CHAPTER-4

1. Which organism exhibits XO XX type of sex determination?

- (a) human
- (b) fruit fly
- (c) bird
- (d) grasshopper

(d)

2. Which of the following is autosomal dominant disease?

- (a) Phenyl ketonuria
- (b) sickle cell anemia
- (c) Cystic fibrosis
- (d) myotonic dystrophy

(c)

3. An example of incomplete effectiveness is-

- (a) Color of flowers in peas
- (b) Color of flowers in Antirrhinum
- (c) Eye color in Drosophila
- (d) all of the above

(b)

4. Down syndrome is caused by trisomy of which of the following chromosomes?

- (a) 6th
- (b) ninth
- (c) twenty-first

(d) twenty-third

(c)

5. A person suffering from Klinefelter's syndrome does not have-

- (a) Appearance of a male
- (b) 46 chromosomes
- (c) microtestis
- (d) Gynecomastia

(b)

6. Haploid-diploid sex determination system is found in?

- (a) in humans
- (b) in bee
- (c) in pigeon
- (d) in monkey

(B)

7. Traits that are usually controlled by three or more genes?

- (a) Characteristics of multiple efficacy
- (b) polygenic traits
- (c) monogenic trait
- (d) low genetic characteristics

(b)

8. Phenyl ketomeuria is an example of what?

- (a) co-effectiveness
- (b) Multidominance of inheritance
- (c) incomplete effectiveness
- (d) Down syndrome

(b)

9. Polygenic inheritance is an example of the influence of environment.

- (a) Skin color in humans
- (b) Down syndrome
- (c) Phenyl ketomuria disease
- (d) Kline Felter Syndrome

(a)

10. The term genotype was coined.

- (a) H.J. by Muller
- (b) By T Baveri
- (c) W.S. by sutton
- (d) W.S. by Johansson

(d)

11. Diseases of amino acid metabolism are-

- (a) Alkaptonuria
- (b) Phenylketonuria
- (c) Albinism
- (d) all of the above

(d)

12. Who said that Down syndrome is caused by extra 21st chromosome?

- (a) J.L. Down (1866)
- (b) Lejayne (1959)
- (c) Kinfelter (1942)
- (d) Haughtington (1872)

(a)

13. In 1900, three biologists discovered Mendel's principles separately.

- (a) D.Bridge, Correns and Shermak
- (b) Sutton, Morgan and Bridges
- (c) Avery, Macleod and McCarthy
- (d) Bateson, Punnett and Bridges

(a)

14. When both alleles living together manifest their effect If we do then what is this incident called?

- (a) effectiveness
- (b) synergy
- (c) multiple effectiveness
- (d) incomplete effectiveness

(B)

15. The exception to Mendel's law is-

- (a) Law of independent discharge
- (b) Law of separation
- (c) association
- (d) Chromosome theory

(c)

16. What is involved in point mutation?

- (a) investment
- (b) single base pair change
- (c) extinction
- (d) doubling
- (b)

17. Father's blood group is AB and mother's is O. What blood groups are these children likely to have?

- (a) A or B
- (b) Only A
- (c) B or O
- (d) Only B

(a)

18. If a man suffering from hemophilia is married to a normal woman, what is the

probability that his son will suffer from hemophilia?

- (a) 100 %
- (b) 75 %
- (c) 50 %
- (d) 0 %

(d)

19. How many types of gametes are formed in a plant whose genotype is AABbCC?

- (a) 9
- (b) 2
- (c) 3
- (d) 4

(B)

Fill in the blanks-

Q. 1. When both alleles living together manifest their effect, then it is called_____.

Answer: synergy

Q. 2. The term genotype is given by_____.

Answer: W.L. johansson

Q. 3. _____Mutation occurs due to increase or decrease in base pairs of DNA.

Answer frame shift

Q.4. _____Propounded the rules of inheritance.

Answer Mendel

Q. 5. _____Developed a diagram called Pennant square.

Answer: Reginald C Punnett

Q. 6. When one gene reduces the effect of another gene, it is called.

north intensity

Q. 7. Down syndrome disorder was first discovered by_____.

North Langham Down

Q. 8. F₁ is called a characteristic that appears in_____ generation.

post dominant symptoms

Q. 9. The chemical and physical factors which cause mutation are called_____.

Answer: mutagenic

Q. 10. Shows the heritable dominance of flower color.

Answer

(i) Snapdragon (ii) Incomplete

Q.11. _____XO exhibits gender determination.

Answer: Grasshopper

Q. 12. _____ It is an autosomal dominant disease.

Answer Cystic Fibrosis

Q. 13. Down syndrome is caused by trisomy of _____ chromosome.

north 21st

Q. 14. Haploid-diploid sex determination system is found in _____.

in north beehive

Q. 15. Traits which are generally controlled by three or more genes. Is called _____.

Answer: polygenic traits

Q. 16. Phenyl ketomuria is an example of _____ disease.

Answer: multidominant inheritance

Q. 17. In 1900, three scientists _____ rediscovered Mendelism.

North D Bridge, Correns and Shermak

Q. 18. Women always _____ suffer from hemophilia.
answer bearer

Q. 19. Plant whose genotype is AA Bb cc. it will form gametes of the _____ type

Answer 2

20. Father's blood group is AB and mother's is O. The blood group of children can be _____.

Answer A or B

Very short question and answer :

Q. 1. Name the scientist who experimentally confirmed the chromosomal theory of inheritance.

Answer: Thomas Hunt Morgan

Q. 2. Inheritance of blood group in humans is an example of which two types of inheritance?

Answer: Codominance and Multiple Allelism

Q. 3. Which event is responsible for independent separation of chromosomes?

Answer: Arrangement and separation of homologous chromosomes in the metaphase stage of meiosis.

Q. 4. How is the distance between two genes located on a chromosome determined?

Answer: The distance between genes is decided on the basis of their recombination frequency. Low frequency indicates close proximity of genes.

Q. 5. Under what conditions can two genes exhibit 50% recombination frequency?

Answer (a) When genes are located on different chromosomes.

(b) Genes located on the same chromosome are far enough apart that crossing over between them is ensured every time.

Q. 6. In which organisms are females heterozygous for sex chromosomes?

Answer: In birds, the female has sex chromosome ZW and is heterozygous.

Q. 7. Who coined the words linkage and recombination?

Answered by Morgan.

Q. 8. How is the hemoglobin of a patient in sickle cell anemia different from the hemoglobin of a normal human being?

Answer The sixth amino acid in the beta globin chain of abnormal hemoglobin is valine. Whereas glutamic acid in normal hemoglobin.

Q. 9. The diploid chromosome number in pea is 14. How many linkage groups will be formed in it?

Answer 7

Q. 10. Write the genotype and phenotype ratio for monohybrid and dihybrid hybridization.

Answer: Genotype and phenotype ratio for monohybrid hybridization - 1:1, for dihybrid hybridization 1:1:1:1

Q. 11. The male of a cockroach species showing XO type of sex determination has 23 chromosomes. How many total chromosomes will the female of this species have?

Answer 24

Q. 12. Which disease is caused by point mutation?

anorectal cell anemia

Q. 13. What is called a mutagen?

Answer: Those physical, chemical and biological factors which cause hereditary changes in the genetic material DNA, genes or chromosomes of the organism.

Q. 14. Male bee has 16 chromosomes while female bee has 32 chromosomes? Give one reason.

Answer: Male bee develops from unfertilized egg.

Q. 15. Write the phenotype and genotype ratio of monohybrid hybridization and dihybrid hybridization.

Answer: Monohybrid hybridization - 3:1 and 1:2:1

Dihybrid hybridization -9:3:3:1 and
1:2:2:4:1:2:
1:2:1

Long Questions

Q. 1. What is a hybrid hybridization?
Explain the laws of dominance and segregation using monohybrid hybridization.

Q. 2. What are Mendelian disorders?
Explain the major Mendelian disorders.

Q. 3. Explain the process of sex determination in humans with a suitable diagram.

Q. 4. (i) What type of sex determination is found in birds?
(ii) Explain sex determination in honey bee with a suitable diagram.

Q. 5. What are chromosomal disorders?
Name the major chromosomal disorders and the reasons for their occurrence.

Q. 6. What is called dihybrid hybridization? Explain with the diagram of independent separation on the basis of two-hybrid hybridization.

Q. 7. What is synergy? Explain by giving examples.

Q. 8. What is incomplete effectiveness?
Explain the inheritance of color in dog flower till F_2 generation.

9. What is genealogical analysis? How is this analysis done?
Is it useful?

Q. 10. What is meant by hybridization? Explain by giving suitable examples.

Q. 11. What is chromosome system of inheritance? Compare the behavior of genes and chromosomes.

Q. 12. What is called mutation? How many types are there? Explain with examples.

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