BIOLOGY

AAKASH INSTITUTE ENGLISH

PRINCIPLES OF INHERITANCE AND VARIATION

Examples

1. State True or False.

(1) Garden pea has seven characters only.

(2) Flowers of Pisum sativum naturally show cross pollination.

(3) A true breeding line shows the stable trait

inheritance.

(4) Mendel applied statisfical methods and mathematical logic for analysing the results.

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2. How many types of gametes can be produced by a diploid organisms, if it is heterozygous for one locus ? Also mention genotypes of gametes.

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3. In garden pea the flowers may be axial (A) or terminal (a) in position. What proportion of the offspring in the

following would be expected to be axial ?

(i) $Aa \times Aa$

(ii) $\mathrm{AA} \times Aa$

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4. When a corss is made pink flowered and red flowered snapdragon plants, what proportion of phenotypein the offspring could be expected to be

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5. Select the set of parents that can produce child with blood group 'O'.

(i) $l^A i \times l^A i$, (ii) $l^B i \times l^A \times l^A$

(iii) $ii \times l^A i$, (iv) $l^B l^B \times l^B i$

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6. In Pisum, yellow seed colour (Y) is dominant over green (y), and round shape of seed (R) is dominant over wrinkled (y). Consider that these two pair of genes assort independently, then

(i) What proportion of the offsprings from the cross the cross $YyRr \times yyrr$ would expected to have yellow-seeded trait ?

(ii) From the cross $Yyrr \times Yyrr$, how many will be pure yellow-wrinkled plants in the resulting generation ?

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7. What will be the possible phenotypic ratio if a white flowered sweet pea plant (ccPP) is crossed to a purple flowered sweet pea plant $(CcPP)$?

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8. Phenotypic ratio of dihybrid cross is _____

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9. Can you tell which of these column A or B represent the chromosome and which represent the gene ?

Column A	Column B
Occur in pairs	Occur in pairs
Segregate at the time of gamete formation such that only one of each pair is transmitted to a gamete.	Segregate at gamete formation and only one of each pair is transmitted to a gamete.
Independent pairs segregate independently of each other.	One pair segregates independently of another pair.

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10. Give the answer of following questions if in a test cross $AaBb \times aa, 87.4\%$ of the progeny are like parents.

(i) Are the genes linked?

(ii) Is there any crossing over between the genes ?

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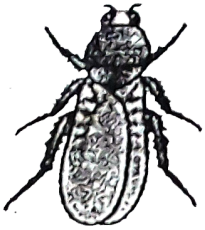
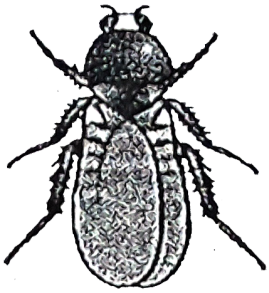
11. State True or False (w.r.t. following diagrams)



Male



Female

(i) During gamete formation, only 50 % of the sperm bear X-chromosome.

(ii) Both male and female individuals have same type of sex chromosomes.

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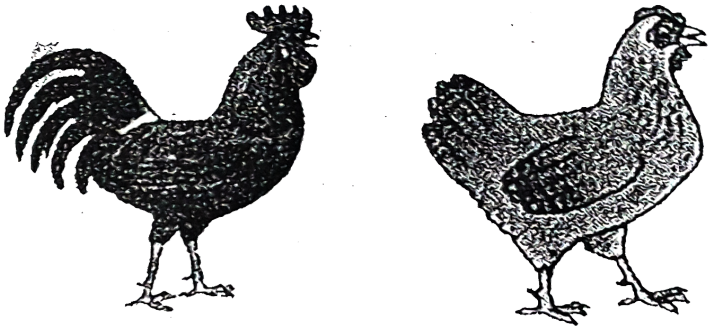
12. Find out the incorrect match.



(A) (B)

(1) A- Homogametic. , (2) B-Female chick.

(3) A-sex determiner , (4) B-Heterogametic

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13. Give one word for the following :

(i) Phenomenon which results in alternation of DNA sequences of consequently results in changes in the

genotype and the phenotype of an organism.

(ii) Type of mutation that arise due to change in a single base pair of DNA.

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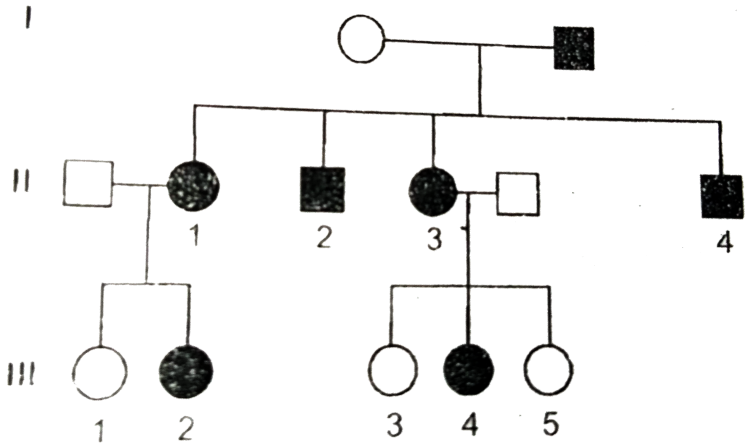
14. In the pedigree given below, indicate whether the shaded symbols indicate dominant or recessive allele. Also give genotype of the whole pedigree.



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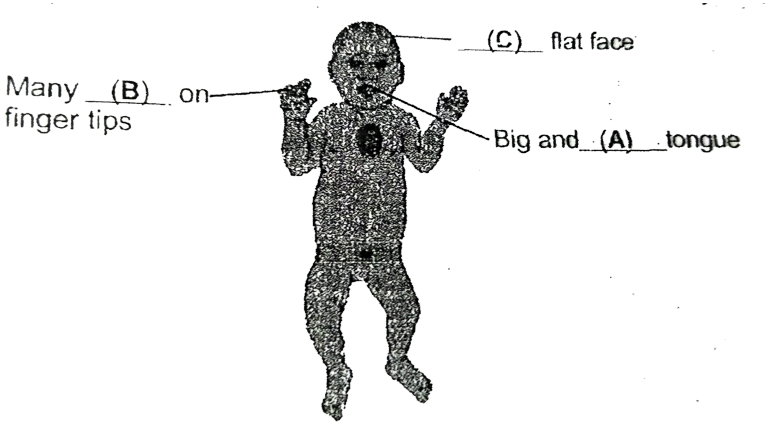
15. Given below is the figure showing an individuals inflicted with Down's syndrome.



Write down the correct words for all the three blanks (A) , (B) and (C) indicated in the figure.

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Try Yourself

1. Fill in the blanks

(i) _____ is the degree by which progeny differes from their parents .

(ii) Pisum sativum produces a _____ number of offspring and completes its life cycle in _____ season .

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2. State True or False :

(i) The transfer of characters from parents to offspring is known as inheritance.

(ii) A true breeding line shows stable trait inheritance and expression for several generations.

(ii) In total Mendal selected 7 breeding pea plant verieties.

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3. How many types of gametes of possible from a dipole organism having genotype AaBBCC ?

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4. Which of the following genotype will produce 4 different types of gametes ?

(1) AAbbccddEE , (2) aaBbCCdd

(3) AaBbCC , (4) Aabb

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5. In Pisum sativum, the pods may be green (G) or yellow (g) What proportion of the offspring in the following crosses would be expected to be homozygous green ?

(i) $Gg \times Gg$, (ii) $Gg \times GG$

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6. In a cross between a yellow and a green speeded pea plants all F_1 members are yellow But F_2 generation riased by crossing two such F_1 consists of approximately $75\ \%$ yellow and $25\ \%$ green seeded pea plants.

(i) What will be the offspring be like two F greens are mated?

(ii) What will be the genotypic ratio in the population of yellow seeded plants in F_2 generation ?

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7. When a cross is made between white and pink flowered Antirrhinum plants what phenotypic ratio is obtained in the resulting generation ?

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8. State True or False ?

(i) A gamete carries only one factor of a character

(ii) Starch synthesis in wrinkled seeded pea plants is most efficient

(iii) Modified allele is always the recessive allele.

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9. (i) Human beings have three alleles for ABO blood grouping |A||B| and i. How many of these alleles can be present in one individual and a gamete ?

(ii) A child has blood group B. If the mother has blood group AB and father blood group A workout the

genetypes of the parents and the possible genotypes of the other offsprings.

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10. In a cross between two pea plants with genotypes TtYY (tall plant with yellow seeds) and Ttyy (tall plants with green seeds) what proportion of the offspring could be expected to be

(i) Tall and yellow

(ii) Dwarf and green

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11. In an animal assume that rough coat (R) is domiant over smooth coat (r) and the black (B) is dominant over white (b). Consider that these two pairs of alleles assort independently then

(i) What proportion of the offspring from the cross $RrBb \times \mathrm{RRBB}$ would be rough and black ?

(ii) From the cross $RrBB \times rrBB$. how many progeny will be homozygous for both of the characters ?

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12. Find out the probable phenotypic ratio if a purple flowered pea plant (CCPp) is crossed to a white flowered sweet pea plant (ccPp)

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13. Find out the number of phenotypes in F_2 generation if a character is controlled by 3 pair of polygenes

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14. State True or False (w.r.t Chromosomal theory of inheritance)

(i) Both chromosomes as well as genes occur in pairs in the somatic cells

(ii) Both chromosomes as well genes segregate at the time of gamete formation such that complete pair is transmitted to a gamete

(iii) Chromosomes are the carriers of Mendel's factors

(iv) The paired condition of both chromosomes as well as Mendelian factors is restored during microsporogenesis .

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15. Fill in blanks (w.r.t. experimental material used by Morgan)

(i) Females are easily distinguishable from the male by the _____ body size.

(ii) It has many type of hereditaly variations that can be seen with _____ power microscope.

(iii) Male individuals have hetromorphic_____ .

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16. Two hetrozgous parents (AaBb) are crossed if the two local are completely linked (AB/ab) what would be the distribution of phenotypic features in resulting generation of test cross ?

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17. State True or False :

(i) In fruit fly genes of white eye and normal wing are X linked recessive

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18. Which of the following statement for the grasshopper is incorrect ?

(1) Male individual is heatrogametic due to two heteromorphic sex chromosomes

(2) Sperm determines the sex of offsprings

(3) Similar number of autosomes are found in male and female individuals both

(4) All eggs contain autosomes as well as X-chromosome.

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19. In third pregnancy of a human couple what will be probability of having a son ?

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20. State True or False

(i) In birds, both the sexes possess two sex chromosomes.

(ii) In butterflies sex determination is exactly opposite the condition found in grassnoppers .

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21. Fill in the blanks

(i) In chicks _____ individual produces two different type of gametes.

(ii) In butterflies all _____ gametes contain autosomes as well as sex chromosome.

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22. State True or False

(i) Chromosomal aberrations are commonly observed in cancer cells

(ii) Mutation is the only phenomenon that leads to variation in DNA.

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23. Fill in the blanks .

(i) Deletions and insertions of base pair of DNA causes _____.

(ii) A classical examples of point mutation is _____.

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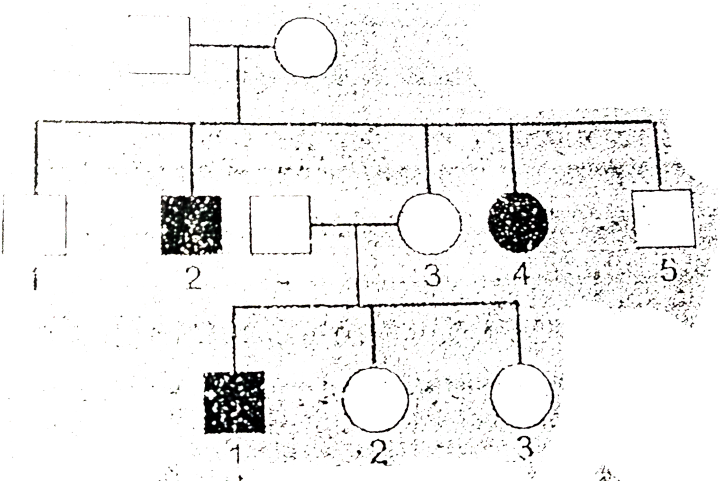
24. Study the given pedigree chart and answer the questions that follow



(i) Trait is autosomal recessive (True/False)

(ii) Give the genotype of the members 3 and 4.

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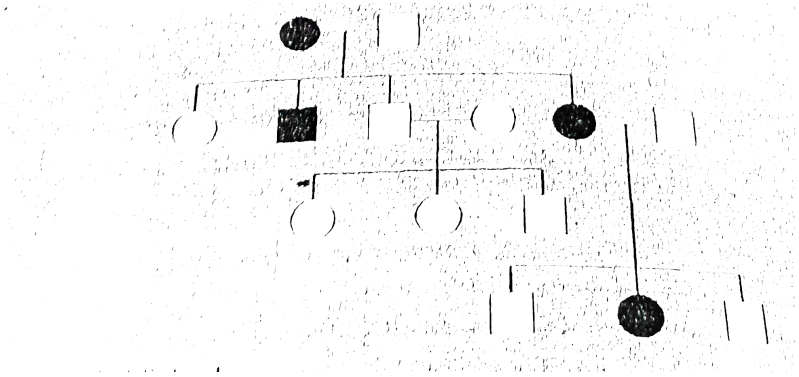
25. In the following pedigree chart, the mutant trait is shaded black. The gene responsible for the trait is



(1) Dominant and X- linked

(2) Dominant and autosomal or dominant and X-linked

(3) Recessive and X-linked

(4) Recessive and Y-linked.

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26. Read the following paragraph carefully and find out the correct words for all the three blanks indicated as (A) (B) and (C)

"the substitution of amino acid in the globin protein results due to the single base subsitution at the 6^{th} codon of the β-globin gene from $\underline{\quad(A)\quad}$ to $\underline{\quad(B)\quad}$. The mutant haemoglobin molecule undergoes polymerisation under $\underline{\quad(C)\quad}$ tension causing the change in the shape of the RBO from biconcave disc to elongated sickle-like structure.

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27. State True of False

(i) Hetrozygous female for haemophilia may transmit the disease to sons

(ii) Affected individuals with phenylketonuna lack an enzyme that converts the amino acid phenylalanine into phenylpyruvic acid

(iii) Klinefelter's syndrome is caused due to the presence of an additional copy of X-chromosome resulting into a karyotype of $47/XXX$

(iv) Failure of segregation of homologous pair of chromosomes during cell division cyclic results in Turner's syndrome.

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Exercise

1. The degree by which progeny differ from their parents is known as

A. Genetics

B. Variation

C. Heredity

D. Inheritance

Answer: B

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2. Sahiwal cows of punjab are developed by

A. Artificial selection

B. Domestication

C. Both (1) & (2)

D. Mutation

Answer: C

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3. Which of the following genotype represents heterozygous condition ?

A. TT

B. tt

C. Tt

D. RR

Answer: C

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4. How many true breeding pea plant varieties were selected by Mendel ?

A. 14

B. 7

C. 21

D. 2

Answer: A

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5. Medel selected Pisum sativum for hybridisation experiments because of

A. Clear contrasting characters and short life span

B. Long life span and non-fertile hybrids

C. Presence of unisexual flowers

D. Infertile hybrids and production of large number of seeds by each plant

Answer: A

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6. Mark the odd one (w.r.t dominant trait in garden pea)

A. Yellow pod

B. Inflated pod

C. Axial flower

D. Yellow seed

Answer: A

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7. Transmission of genetic characters from parents to offspring is

A. Variation

B. Heredity

C. Blending

D. Somatoplasm

Answer: B

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8. Who coined the term 'allele'?

A. Saunders

B. Bateson

C. Johannsen

D. Mendel

Answer: B

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9. Which of the following trait of garden pea is present on 7^{th} chromosome ?

A. Pod shape

B. Pod colour

C. Seed shape

D. Stem height

Answer: C

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10. All traits can express themseleves in hetrozygous condition, except

A. Tall

B. Violet

C. Axial

D. Wrinkled seed

Answer:

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11. The phenotype of F_1 hybrid is intermediate expression of the two parents in

A. Dominance

B. Incomplete dominance

C. Co-dominance

D. Intermediate inheritance

Answer: B

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12. Mendel proposed law of dominance and law of segregation based on his observations on

A. Monohybrid crosses

B. Dihybrid crosses

C. Test crosses

D. Out crosses

Answer: A

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13. Which of the following phenotypic ratio was found by Mendel in F_2 generation of a dihybrid cross ?

A. $3:1$

B. $1:2:1:2:4:2:1:2:1$

C. $9:3:3:1$

D. $12:4$

Answer: C

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14. Both phenotypic and genotypic ratio of F_2 are same in

A. Co-dominance

B. Incomplete dominance

C. Out cross

D. More than one option is correct

Answer: D

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15. The ability of a gene to have multiple phenotypic effects is known as

A. Pleiotropy

B. Co-dominance

C. Incomplete dominance

D. Complete dominance

Answer: A

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16. How many types of gametes can be produced by a diploid organisms, if it is heterozygous for 3 loci?

A. 6

B. 4

C. 8

D. 3

Answer: C

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17. What will be genotypic ratio in the F_2 generation of a monohybrid cross ?

A. $9:3:3:1$

B. $1:2:1$

C. $1:1$

D. $3:1$

Answer: C

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18. A cross between F_1 hybrid and its homozygous recessive parent is called

A. Out cross

B. Test cross

C. Monohybrid cross

D. Dihybrid cross

Answer: B

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19. Select the correct option w.r.t law of independent assortment

(a) It can be explained by using monohybrid cross

(b) Inheritance of one character is dependent on another character

(c) This law is not applicable universally

(d) It was proposed by Bateson

A. It can be explained by using monohybrid cross

B. Inheritance of one character is dependent on another character

C. This law is not applicable universally

D. It was propased by Bateson

Answer: C

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20. Find the incorrect match

(a) Gamete : Pure for a trait

(b) Co-dominance : Flower color in Snapdragon

(c) Recessive gene : Expressed in homozygous

(d) Incomplete dominance : Carl Correns

A. Gamete : Pure for a trait

B. Co-dominance : Flower colour in Snapdragon

C. Recessive gene : Expressed in homozygous

D. Incomplete dominance : Carl Correns

Answer: B

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21. Select the odd one out w.r.t non-allellic gene interactions

(a) Epistasis

(b) Duplicate genes

(c) Incomplete dominance

(d) Complementary genes

A. Epistasis

B. Duplicate genes

C. Incomplete dominance

D. Complementary genes

Answer: C

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22. Fruit colour in Cucurbita pepo is an example of

A. Complementary genes

B. Duplicate genes

C. Dominant epistasis

D. Polymeric genes

Answer: C

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23. Complementary genes were demonstrated by Bateson and Punnet in

A. Capsella

B. Lathyrus odoratus

C. Antirrhinum

D. Mirabilis

Answer: B

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24. If dominant alleles of two gene loci produce the same phenotype whether separately or together. It will be

A. Recessive epistasis

B. Dominant epistasis

C. Duplicate genes interaction

D. Inhibitory genes interaction

Answer: C

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25. A gene which hides the action of another gene is termed as

(a) Co-dominant gene

(b) Epistatic gene

(c) Hypostatic gene

(d) Lethal gene

A. Co-dominant gene

B. Epistatic gene

C. Hypostatic gene

D. Lethal gene

Answer: B

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26. In polymeric gene action, the modified dihybrid phenotypic ratio in F_2 generation is

(a) $9:3:3:1$

(b) $13:3$

(c) $9:6:1$

(d) $12:3:4$

A. $9:3:3:1$

B. $13:3$

C. $9:6:1$

D. $12:3:4$

Answer: C

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27. Which of the following genotypes of sweet pea plant is related with the production of purple coloured flowers

(a) CcPp

(b) CCpp

(c) ccPP

(d) Ccpp

A. CcPp

B. CCpp

C. ccPP

D. *Ccpp*

Answer: A

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28. Select the odd one out w.r.t polygenic inheritance

A. Bell-shaped curve's obtained

B. Also called quantitative inheritance

C. Recessive alleles show cumulative effect

D. Intermediate phenotypes are more frequent

Answer: C

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29. Select the correct match (w.r.t dihybrid phenotypic ratio in F_2 generation)

A. Recessive epistasis : $12:3:1$

B. Dominant epistasis : $9:3:4$

C. Collaborative gene : $9:3:3:1$

D. Duplicate genes : $9:7$

Answer: C

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30. Skin colour in man is controlled by

A. Three pairs of polygenes

B. Duplicate genes

C. Six pairs of polygenes

D. Supplementary genes

Answer: A

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31. Select the odd one out w.r.t chromosomal theory of inheritance

A. It was proposed by Sutton and Boveri

B. Behaviour of chromosomes is parallel to behaviour of genes

C. Chromosomes and genes occur in pairs in diploid cells respectively

D. The paired condition of both chromosomes as well as Mendellan factors is restored during fertilization

Answer: C

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32. The term gene for Mendellan factor was coined by

A. Sutton & Boveri

B. Morgan

C. Bateson

D. Johannsen

Answer: D

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33. Morgan used Drosophila as experimental material because

(a) It cannot be reared and bred under lab conditions

(b) A single mating produce very few offsprings

(c) It has high number of morphologically similar

chromosomes

(d) It has a short life span

A. It cannot be reared and bred under lab conditions

B. A single mating produce very few offsprings

C. It has high number of morphologically similar chromosomes

D. It has a short life span

Answer: D

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34. Who carried out several dihybrid crosses in Drosophila to study genes that were sex-linked?

(a) Morgan

(b) Sutton

(c) Bateson

(d) Punnet

A. Morgan

B. Sutton

C. Bateson

D. Punnet

Answer: A

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35. Female Drosophila is

(a) Smaller in size than male

(b) Larger in size than male

(c) Larger in size with shorter life span than male

(d) Having heteromorphic sex chromosomes

A. Smaller in size than male

B. Larger in size than male

C. Larger in size with shorter life span than male

D. Having heteromorphic sex chromosomes

Answer: B

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36. Find the odd one out w.r.t complete linkage

A. $100\ \%$ parental combinations in F_2 generation

B. F_2 phenotypic ratio is $3:1$ in monohybrid cross

C. Dihybrid test cross ratio is $1:1$ in F_2 generation

D. Linked genes tend to separate frequently

Answer: D

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37. A condition where an individual heterozygous for two pairs of linked genes (AaBb) possesses the two

dominant genes on one homologous chromosomes pair and two recessive on the other it is said to be

(a) Cis-arrangement

(b) Trans-arrangement

(c) Partly cis partly trans

(d) More than one option is correct

A. Cis-arrangment

B. Trans-arrangement

C. Partly cis partly trans

D. More than one option is correct

Answer: A

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38. How many linkage groups are present in human male?

(a) 24

(b) 23

(c) 46

(d) 22

A. 24

B. 23

C. 46

D. 22

Answer: A

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39. What is the recombination percentage between gene y and w in Drosophila?

(a) $1.3\ \%$

(b) $98.7\ \%$

(c) $62.8\ \%$

(d) $37.2\ \%$

A. $1.3\ \%$

B. $98.7\ \%$

C. $62.8\ \%$

D. $37.2\ \%$

Answer: A

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40. Find the incorrect statement w.r.t chromosomal mapping

A. Crossing over is important in locating genes on chromosome

B. Recombination frequency depends upon the distance between the genes

C. Recombination frequency is inversely proportional to distance between genes

D. The sequences and relative distances between various genes is graphically represented in term of

recombination frequencies

Answer: C

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41. Individuals having homomorphic sex-chromosomes produce

(a) One type of gametes

(b) Two types of gametes

(c) No gametes

(d) Only one gamete in complete life span

A. One type of gametes

B. Two type of gametes

C. No gametes

D. Only one gamete in complete life span

Answer: A

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42. Holandric genes are present on

(a) X-chromosomes

(b) Y-chromosomes

(c) Sex-chromosomes as well as autosomes

(d) Autosomes

A. X-chromosomes

B. Y-chromosomes

C. Sex-chromosomes as well as autosomes

D. Autosomes

Answer: B

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43. Mark the incorrect pair (w.r.t sex determination)

(a) ZW-ZZ type - Fishes

(b) ZO-ZZ type - Birds

(c) XX-XO type - Dioscorea

(d) XX-XY type - Melandrium

A. ZW-ZZ type - Fisjes

B. ZO-ZZ type - Birds

C. XX-XO type - Dioscorea

D. XX-XY type - Melandrium

Answer: B

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44. $50\ \%$ sperms are devoid of sex-chromosomes in

(a) Melandrium

(b) Moth

(c) Grasshopper

(d) Bee

A. Melandrium

B. Moth

C. Grasshopper

D. Bee

Answer: C

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45. In the XX-XO type of sex chromosomes in

(a) Females produce only one type of eggs

(b) Females have only one X-chromosomes

(c) Males have two X- chromosomes

(d) Males are homogametic

A. Females produce only one type of eggs

B. Females have only one X-chromosomes

C. Males have two X- chromosomes

D. Males are homogametic

Answer: A

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46. Select the odd one out w.r.t genic balance theory of sex-determination in Drosophila

(a) Y-chromosome plays no role in sex-determination

(b) Given by C.B . Bridges

(c) If X/A ratio is one, superfemales are produced

(d) If X/A ratio is less than 0.5, supermales are produced

A. Y-chromosome plays no role in sex-determination

B. Given by C.B . Bridges

C. If X/A ratio is one, superfemales are produced

D. If X/A ratio is less than 0.5, supermales are produced

Answer: C

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47. Environmental mechanism of sex-determination is seen in

A. Bonnelia

B. Crepidula

C. Grasshopper

D. More than one option is correct

Answer: D

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48. Select the odd one out w.r.t haemophilia

A. X-linked dominant disorder

B. Bleeder's disease

C. Criss-cross inheritance

D. X-linked recessive disorder

Answer: A

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49. Select the correct match

A. Sex-limited trait - Colour blindness

B. Sex-limited trait - Express in both sexes

C. Sex-influenced trait - More frequent in one sex than in the other

D. Sex-influenced trait - Porcupine skin

Answer: C

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50. All sex limited traits, except

A. Beard in man

B. Porcupine skin

C. Antlers in male deer

D. Brilliant plumage in peacock

Answer: B

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51. Mark the odd one wrt chromosomal disorder

A. Down syndrome

B. klinefelters syndrome

C. Turner syndrome

D. phenylketonuria

Answer: C

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52. Find the incorrect match with respect to mutations

A. Somatic mutation - No evolutionary importance

B. Germinal mutation - Blastogenic mutation

C. Frame shift mutation - Gibberish mutation

D. Chromosomal mutation - Transversion

Answer: D

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53. Substitution of a purine with another type of purine is called

A. Transversion

B. Transition

C. Inversion

D. Translocation

Answer: B

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54. Inversion without involving the centromere is called

A. Paracentric

B. Monosomy

C. Pericentric

D. Tautomerization

Answer: A

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55. Aneuploidy which results in loss of a complete homologous pair of chromosomes is

A. Trisomy

B. Tetrasomy

C. Nullisomy

D. Euploidy

Answer: C

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56. Which of the following chemical is a base analogue ?

A. 5-bromouracil

B. Acridines

C. Nitrous acid

D. Hypoxanthine

Answer: A

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57. Cytoplasmic male steritiy in maize is due to defective

A. Mitochondria

B. Lysosome

C. Golgi body

D. Leucoplast

Answer: A

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58. Select the incorrect statement regarding pedigree analysis

A. Solid symbol shows the unaffected individual

B. It is useful for genetic counsellors

C. Proband is the person from which case history starts

D. It is an analysis of traits in a several generations of a family

Answer: A

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59. Which of the following abnormalities is due to X-linked recessive mutation ?

A. Cystic fibrosis

B. Thalassaemia

C. Klinefelter's syndrome

D. Lesch-Nyhan syndrome

Answer: D

Watch Video Solution

60. Find odd one (w.r.t dominant traits in humans)

A. Blue eyes

B. Brown eyes

C. Free ear lobes

D. Myotonic dystrophy

Answer: A

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Assignment Section A

1. Mark th odd one (w.r.t true breeding line)

A. Shows the stable trait inheritance

B. Shows expression for few generations only

C. Undergone continous self-pollination

D. Both (1) & (3)

Answer: B

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2. Which of the following is not a dominant trait in edible pea ?

A. Axial flower

B. Inflated pod

C. Green seed colour

D. Green pod

Answer: C

Watch Video Solution

3. Define the term phenotype.

Watch Video Solution

Watch Video Solution

4. What will be possible blood group in children from the parents with B and AB blood groups ?

A. A,O

B. A,B,AB & O

C. A, B, AB

D. B, O

Answer: C

Watch Video Solution

5. In garden pea, starch is synthesised effectively in

A. Heterozygous round seeded plants

B. Homozygous round seeded plants

C. Wrinkled seeded plants

D. Pure and hybrid round seeded plants

Answer: B

Watch Video Solution

6. $F1$ progeny of Mendelian dihybrid cross produce

A. Two types of pollen grains

B. Four genotypes of gametes

C. Two types of eggs

D. Four type of pollens only

Answer: B

Watch Video Solution

7. When Mendel self hybridised the F_1 plants $(RrYy)$ he found that dominant and recessive traits of one character are segregated in a

A. $9:1$ ratio

B. $3:3$ ratio

C. $10:6$ ratio

D. $3:1$ ratio

Answer: D

Watch Video Solution

8. Mendel published his work on inheritance of characters in 1865 butit remained unrecognised till 1900 because

(a) He could not provide any physical proof for the existance of factors

(b) His concept of factors as stable, discrete units that acceptance from the contemporaries

(c) Mendel's approach of using approach of using mathematics to explain biological phenomena was totally old

(d) Communication was not easy (as it is now)

A. (a), (b) & (c) are correct

B. (c) & (d) are correct

C. (a), (b) & (d) are correct

D. Only (a) is correct

Answer: C

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9. Which of the following statement for chromosomal theory of inheritance is incorrect ?

A. Pairing and segregation of a pair of chromosomes would lead to the segregation of a factor they carried

B. Behaviour of chromosomes is parallel to the behaviour of genes

C. The two alleles of a gene pair are located on homologous sites on homologous chromosomes

D. Chromosomes as well as genes occur in pairs

Answer: A

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10. Experimental verification of the chromosomal theory of inheritance was done by:

A. Sutton & Boveri

B. Correns

C. T.H. Morgan

D. Tschermak

Answer: C

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11. Fruit flies are one of the best materials for genetic studies because of all , except

A. Ability to grow on simple synthetic medium in the laboratory

B. Short life span

C. Production of a large number of progeny in each mating

D. Presence of few externally visible and identifiable contrasting traits

Answer: D

 Watch Video Solution

12. Generation of non-parental gene combination is termed as

A. Linkage

B. Polyploidy

C. Recombination

D. Aneuploidy

Answer: C

Watch Video Solution

13. The initial clue about the genetic/chromosomal mechanism of sex determination can be traced back to some of the experiments carried out in

A. Human beings

B. Birds

C. Insects

D. Plants

Answer: C

Watch Video Solution

14. In which of the sex determination both male and female same number of chromosomes ?

A. XY type

B. ZO type

C. XO type

D. Both (1) & (3)

Answer: A

Watch Video Solution

15. Two different types of gametes in terms of the sex chromosomes, are produced by

A. Female fruit fly

B. Male butterfly

C. Male human and female Drosophila

D. Female birds

Answer: D

Watch Video Solution

16. Individuals having homomorphic sex-chromosomes produce

A. Only one gamete in complete life span

B. One type of gametes

C. No gametes

D. Two type of gametes

Answer: B

Watch Video Solution

17. Which of the following phenomena leads to variation in DNA ?

A. Linkage, mutation

B. Recombination, linkage

C. Mutation, recombination

D. Aneuploidy, linkage

Answer: C

Watch Video Solution

18. Sickle cell-anaemia disorder arises due to

A. Duplication of a segment of DNA

B. Substitution in a single base of DNA

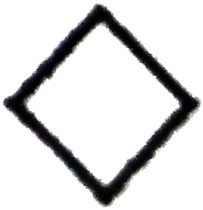
C. Deletion of a segment of DNA

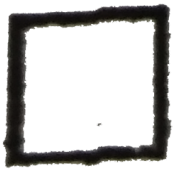
D. Duplication in a base pair of RNA

Answer: B

Watch Video Solution

19. In pedigree analysis, symbol given for sex unspecified is

A. 

B. 

C. 

D. 

Answer: A

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20. Cystic fibrosis, Myotonic dystrophy and Thalassemia are

A. Chromosomal disorder

B. Autosomal recessive disorders

C. Mendelian disorders

D. Autosomal dominant disorder

Answer: C

Watch Video Solution

21. Which of the following trait shows transmission from carries female to male progeny ?

A. Automosomal dominant

B. X-linked recessive

C. Y-linked recessive

D. X-linked dominant

Answer: B

Watch Video Solution

22. Phenylketonuria is an inborn error of metabolism that is inherited as

A. Autosomal recessive trait

B. Sex-linked dominant trait

C. X-linked recessive trait

D. autosomal dominant trait

Answer: A

Watch Video Solution

23. Which of the following abnormalities is due to autosomal dominant mutation ?

A. Colour blindness

B. Thalassemia

C. Myotonic dystrophy

D. Haemophilia

Answer: C

Watch Video Solution

24. Absence or excess or abnormal arrangement of one or more chromosomes results in

A. Point mutation

B. Chromosomal disorders

C. Mendelian disorders

D. Gene mutation

Answer: B

Watch Video Solution

25. Mark the odd one w.r.t syndrome which occurs due to failure of segregation of homologous pair of chromosomes during cell division cycle.

A. Klinefelter's syndrome

B. Down's syndrome

C. Turner's syndrome

D. Thalassemia

Answer: D

Watch Video Solution

26. Heterozygous round and yellow seeded pea plants were selfed and total 800 seeds are collected. What is the total number of seeds with first dominant and second recessive traits ?

A. 950

B. 300

C. 200

D. 150

Answer: D

Watch Video Solution

27. Which of the disorder is related with the Karyotype given below ?

A. Turner's syndrome

B. Down's syndrome

C. Myotonic dystrophy

D. Cystic fibrosis

Answer: B

Watch Video Solution

28. Mark the correct match

A. Turner's syndrome - 45 + XO

B. Phenylketonuria - 44 + XYY

C. Klinefelter's syndrome - 44 + XXY

D. Thalassemia - 44 + YO

Answer: C

Watch Video Solution

29. Physical , psychromotor and mental development is retarded in an individual affected with

A. Down's syndrome

B. Sickle cell anaemia

C. Turner's syndrome

D. Colour blindness

Answer: A

Watch Video Solution

30. In which of the following disorder's affected individual's posses 47 chromosomes ?

A. Turner's syndrome

B. Klinefelter's syndrome

C. Down's syndrome

D. Both (2) & (3)

Answer: D

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31. The affected individuals are short statured disorder like

A. Turner's syndrome , phenylketonuria

B. Down's syndrome, Turners's syndrome

C. Klinefelter's syndrome, Down's syndrome

D. Turner's syndrome, Klinefelter's syndrome

Answer: B

Watch Video Solution

32. In which of the following disorder gynacomastia symptom is seen in individuals ?

A. Down's syndrome

B. Turner's syndrome

C. Klinefelter's syndrome

D. Phenylketonuria

Answer: C

Watch Video Solution

33. Mark the correct option (w.r.t monosomy)

A. Klinefelter's syndrome

B. Down's syndrome

C. Turner's syndrome

D. Haemophilia

Answer: C

Watch Video Solution

34. Allosomic trisomy condition is seen in

A. Turner's syndrome

B. Klinefelter's syndrome

C. Down's syndrome

D. Both (2) & (3)

Answer: B

Watch Video Solution

Watch Video Solution

35. Which of the following disorder is seen in human female only ?

A. Turner's syndrome

B. Down's syndrome

C. Haemophilia

D. Klinefelter's syndrome

Answer: A

Watch Video Solution

Assignment Section B Objective Type Questions

1. When a pink flowered Antirrhinum plant is test crossed, then phenotypic ratio in resulting progenies is

A. 1 Red : 1 White

B. 3 Red : 1 White

C. 2 Pink : 1 White

D. 1Pink : 1 White

Answer: D

Watch Video Solution

2. Heterozygous tall and violet flowered pea plants were selfed and total 512 seeds are collected. What will be total number of seeds for both heterozygous traits ?

A. 128

B. 256

C. 384

D. 64

Answer: A

Watch Video Solution

3. Mark the odd one (w.r.t. F_2 generation of Mendelian dihybrid cross)

A. Frequency of TtRR genotype $= 12.5\,\%$

B. Frequency of ttrr genotype $= 6.25\,\%$

C. Frequency of TTRR genotype $= 6.25\,\%$

D. Frequency of TTRR genotype $= 25\,\%$

Answer: D

Watch Video Solution

4. Morgan hybridised yellow-bodied, white-eyed females to brown-bodied red-eyed males and intercrossed their

F_1 progeny. He observed that

(a) F_2 ratio was deviated very significantly from the $9:3:3:1$ ratio

(b) Both genes did not segregate independently of each other

(c) Recombinant types are not obtained in F_2 generation

(d) Both genes segregate independently of each other

Select the correct set of statements :

A. (a) & (b) only

B. (b) & (c) only

C. (b) & (d) only

D. (c) & (d) only

Answer: A

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5. $\underline{(A)}$ used the frequency of recombination between gene pairs on the $\underline{(B)}$ as a measure of the distance between genes and mapped their position on the chromosome.

A. A: Morgan; B: Same chromosome

B. A: Sturtevant; B: Different chromosomes

C. A: Morgan; B: Different chromosomes

D. A: Sturtevant; B: Same chromosome

Answer: D

Watch Video Solution

6. While solving the problem of sex determination in large number of insects, it was observed that

A. All eggs lack sex chromosome

B. Some of the sperm bear the X-chromosome

C. All eggs as well as sperms bear the X-chromosomes

D. Some of the eggs bear the X-chromosome

Answer: B

Watch Video Solution

7. Loss or gain of a segment of DNA results in

A. Frame-shift mutation

B. Point mutation

C. Polyploidy

D. Chromosomal aberration

Answer: D

Watch Video Solution

8. Which one of the following is a physical factor that induce mutation ?

A. Acridines

B. HNO_2

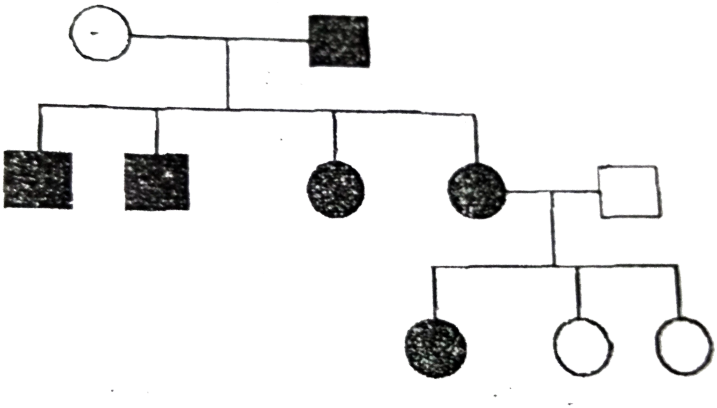
C. UV-Rays

D. Base analogue

Answer: C

Watch Video Solution

9. In the given pedigree, indicate whether the shaded symbols indicate dominant or recessive allele.



A. Recessive

B. Codominant

C. Dominant

D. It can be recessive or dominant both

Answer: D

Watch Video Solution

10. In which of the following disorder a single protein that is a part of the cascade of proteins involved in blood clotting is affected ?

A. Thalassemia

B. Sickle-cell anaemia

C. Haemophilia

D. Phenylketonuria

Answer: C

Watch Video Solution

11. Mark the correct statement (w.r.t. sickle cell -anaemia)

A. Homozygous individuals for Hb^S are apparently unaffected

B. Heterozygous individuals exhibits sickle-cell trait

C. Heterozygous individuals are affected as well as carrier

D. Homozygous individuals for Hb^A show the diseased phenotype

Answer: B

Watch Video Solution

12. The defect sickle-cell anaemia is caused by the _____ of glutamic acid by the valine at the 6^{th} position of the _____ globin chain of the haemoglobin molecule.

A. Substitution, β

B. Deletion, α

C. Duplication, β

D. Translocation , α

Answer: A

Watch Video Solution

13. A holandric gene in man causes hypertrichosis. When a man with hairy ears marrier a normal woman

A. $25\ \%$

B. $0\ \%$

C. $50\ \%$

D. $100\ \%$

Answer: B

Watch Video Solution

14. A normal woman, whose father had color blindness, married a normal man. What is the chance of occurrence

of color blindness in the progeny?

(a) 25 %

(b) 50 %

(c) 100 %

(d) 75 %

A. $25\ \%$

B. $50\ \%$

C. $100\ \%$

D. $75\ \%$

Answer: A

Watch Video Solution

15. Mr. Stevan is suffering from hemophilia and cystic fibrosis. His father is heterozygous for cystic fibrosis. The probability of Stevan's sperm having recessive X-linked as well as autosomal allele is

(a) $\frac{1}{4}$

(b) $\frac{1}{16}$

(c) $\frac{1}{2}$

(d) $\frac{1}{8}$

A. $\frac{1}{4}$

B. $\frac{1}{16}$

C. $\frac{1}{2}$

D. $\frac{1}{8}$

Answer: C

Watch Video Solution

16. Select incorrect one (w.r.t reciprocal cross)

(a) To know whether the alleles are present on sex chromosomes or autosomes

(b) It is made to eliminate the effect of nuclear traits

(c) Two individuals with contrast genotypes are involved

(d) Results are not changed for autosomal traits

A. To know whether the alleles are present on sex chromosomes or autosomes

B. It is made to eliminate the effect of nuclear traits

C. Two individuals with contrast genotypes are involved

D. Results are not changed for autosomal traits

Answer: B

Watch Video Solution

17. The chromosome maps are not accurate maps because

A. Crossing over frequency is higher than recombination frequency

B. One crossing over interferes and increases the frequency of nearby crossing over

C. Crossing over frequency decreases towards the ends of chromosome

D. Heterochromation increases crossing over

Answer: A

Watch Video Solution

18. In Lathyrus odoratus, hybrid blue flowered and long pollen plant is test crossed with homozygous recessive red flowered and round pollen plant then how many

parental types are obtained when genes are present in cis stage in parents ?

A. $50\ \%$

B. $43.7\ \%$

C. $87.4\ \%$

D. $12.6\ \%$

Answer: C

Watch Video Solution

19. Find out the frequency of AabbCcDdee if parents are AabbCCddEe and AabbccDdee

A. $0.78\ \%$

B. $12.5\ \%$

C. $25\ \%$

D. $50\ \%$

Answer: B

Watch Video Solution

20. In complete dominance

A. Dominant trait is completely expressed in the generation

B. Phenotypic and genotypic ratio are different

C. Two dominant alleles are needed to express complete dominant trait

D. $F1$ individuals have the equal traits of both parents

Answer: C

Watch Video Solution

21. Progeny with blood group 'O' can be obtained cross

A. $A \times A$

B. $A \times B$

C. $O \times AB$

D. $B \times B$

Answer: C

Watch Video Solution

22. If a agouti mice (CcAa) is crossed with albino mice (ccAA), then how many albino mice are produced in resulting progeny ?

A. 4

B. 9

C. 2

D. 3

Answer: C

Watch Video Solution

23. Match the following - (w.r.t. Pedigree analysis)

	Column - I		Column - II
a.	Solid symbol	(i)	Carrier of sex linked tra
b.	Horizontal line between symbols	(ii)	Offspring
c.	Horizontal line above the symbols	(iii)	Trait to be studied
d.	Dot in centre	(iv)	Parents

A. $a(iv), b(ii), c(ii), d(i)$

B. $a(ii), b(iii), c(iv), d(i)$

C. $a(iii), b(iv), c(ii), d(i)$

D. $a(i), b(ii), c(iv), d(iii)$

Answer: C

Watch Video Solution

24. Which of the following parental combination has produced mutant offspring ?

A. $Tt \times$ tt $= Tt$

B. x = Tt`

C. $Tt \times Tt =$ tt`

D. $\mathrm{TT} \times$ tt $= Tt$

Answer: B

Watch Video Solution

25. Epistasis and dominance are respectively

A. Intragenic, Intergenic

B. Non-allelic, Extra-allelic

C. Non-allelic , Interallelic

D. Intergenic, Non-allelic

Answer: C

Watch Video Solution

26. Which of the following combination seems to have some linkage in character selected by Mendel ?

A. Stem height and pod colour

B. Flower colour and flower

C. Flower colour and flower position

D. Seed shape and seed colour

Answer: D

Watch Video Solution

27. A diploid organism is heterozygous for five loci and homozygous for 2 loci , how many types of gametes can

be produced ?

A. 128

B. 32

C. 4

D. 14

Answer: B

Watch Video Solution

28. Lesch Nyhan disease is an X-linked recessive disorder that causes neurological damage in human beings. A survey of 500 males from a caucasion population

revealed that 20 were effected with this disorder. What is the frequency of the normal allele in this population ?

A. 9.6

B. 0.8

C. 0.096

D. 96

Answer: B

Watch Video Solution

29. How many types of zygotic combinations are possible between a cross Aa BB Cc Dd $\times$ AA bb Cc DD ?

A. 32

B. 128

C. 64

D. 16

Answer: D

Watch Video Solution

30. In a complimentary gene interaction calculate the number of phenotype and genotype produced in a cross AaBb $\times$ aaBB

A. 1 phenotype, 2 genotypes

B. 2 phenotypes, 4 genotypes

C. 4 phenotypes, 4 genotypes

D. 2 phenotypes, 2 genotypes

Answer: B

Watch Video Solution

31. Select incorrect statements

A. Male insects have one chromosome less than the female insects

B. In birds sex is determined by the female and not the male

C. In humans , sex is determined equally by the male and the female

D. none of these

Answer: C

Watch Video Solution

32. In phenylketonuria

A. Break down of phenylatanine is rapid

B. Accumulation of phenylalanine in body

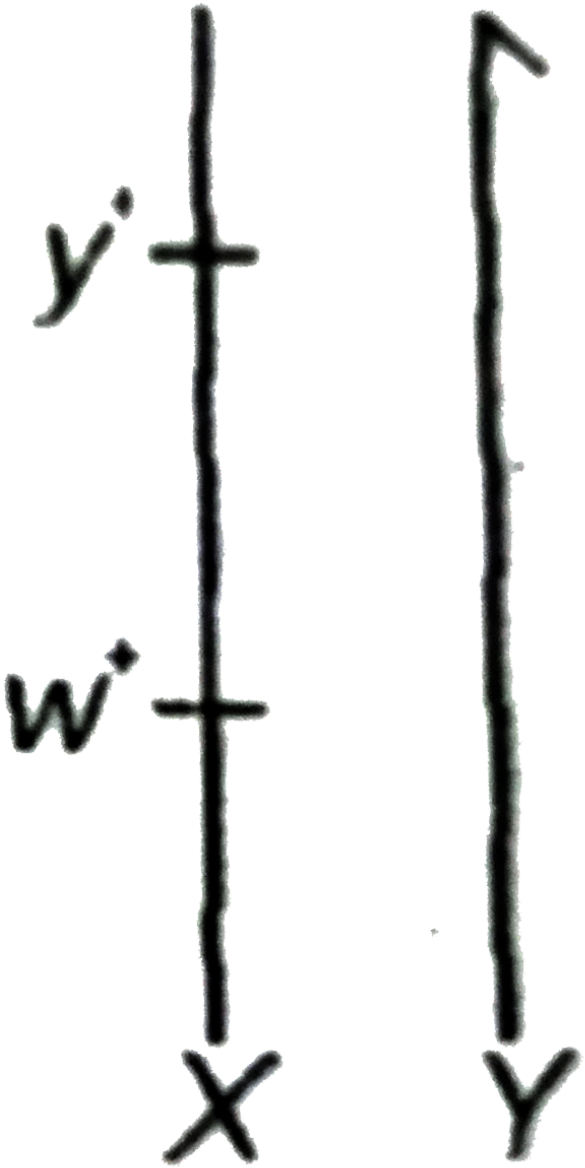
C. Chromosomes constitution of patient changes

D. TSD gene situated on chromosomes 15 undergoes mutation

Answer: B

33. How many types of gametes will be produced by a female Drosophilla having following arrangement of two

genes (y^+ and w^+) on X-chromosome ?



A. 2

B. 4

C. 1

D. 8

Answer: A

Watch Video Solution

34. If interference is complete or cent percent then the frequency of observed crossover will be

A. Equal to expected frequency

B. Greater than expected frequency

C. Lesser than expected frequency

D. zero

Answer: D

Watch Video Solution

35. In F_2 generation of a Mendelian dihybrid cross $(\mathrm{TTRR} \times \mathbf{r}r)$

A. Tall plants and violet flowered plants are obtained in $1:1$ frequency

B. Ratio of parental and non-parental plants is $1:15$

C. Recombinant plants are obtained in $1:1$ frequency

D. More than one option is correct

Answer: D

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Assignment Section C Previous Years Questions

1. A disease caused by an autosomal primary non-disjunction is

A. Down's syndrome

B. Klinefelter's syndrome

C. Turner's syndrome

D. Sickle cell anemia

Answer: A

Watch Video Solution

2. Thalassemia and sickle cell anemia are caused due to a problem in globin molecule synthesis. Select the correct statement

A. Both are due to a qualitative defect in globin chain synthesis

B. Both are due to a quantitative defect in globin chain synthesis

C. Thalassemia is due to less synthesis of globin molecules

D. Sickle cell anemia is due to a quantiative problem of globin molecules

Answer: C

 Watch Video Solution

3. Which one form those given below is the periods for Mendel's hybridization experiments

A. 1856-1863

B. 1840-1850

C. 1857-1869

D. 1870-1877

Answer: A

Watch Video Solution

4. The genotypes of husband and wife are $I^A I^B$ and $I^A i$. Among the blood groups of their children how many different genotypes and phenotypes are possible

A. 3 genotypes , 3 phenotypes

B. 3 genotypes , 4 phenotypes

C. 4 genotypes , 3 phenotypes

D. 4 genotypes , 4 phenotypes

Answer: C

Watch Video Solution

5. Among the following characters, which one was not considered by Mendel in his experiment on pea

A. Stem - Tail or Dwarf

B. Trichomes - Glandular or non-glandular

C. Seed-Green or Yellow

D. Pod - Inflated or Constricted

Answer: B

Watch Video Solution

6. the mechanism that causes a gene to move from one linkage group to another is called :

A. Inversion

B. Duplication

C. Translocation

D. Crossing-over

Answer: C

Watch Video Solution

7. A true breeding plant is:

A. One that is able to breed on its own

B. Produced due to cross-pollination among unrelated plants

C. Near homozygous and produces offspring if its own kind

D. Always homozygous recessive in its genetic constiution

Answer: C

Watch Video Solution

8. If a colour blind man marries a woman who is homozygous for normal colour vision,the probability of their son being colour blind is :

A. 0

B. 0.5

C. 0.75

D. 1

Answer: A

Watch Video Solution

9. In a testcross involving $F1$ dihybrid flies, more parental-type offspring were produced than the recombinant-type offspring. This indicates:

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

B. The two genes are located on two difference chromosomes

C. Chromosomes failed to separate during meiosis

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

Answer: D

Watch Video Solution

10. Which of the following most appropriately describes haemophilia ?

A. Dominant gene disorder

B. Recessive gene disorder

C. X-linked recessive gene disorder

D. Chromosomal disorder

Answer: C

Watch Video Solution

11. A tall true breeding garden pea plant is crossed with a dwarf true breeding garden pea plant. When the F_1 plant were selfed the resulting genotypeswere in the ratio of

A. $3:1::\text{Dwarf}:\text{Tall}$

B.

$1:2:1::\text{Tall homozygous}:\text{Tall homozygous}:\text{Dwarf}$

C.

$1:2:1::\text{Tall heterozygous}:\text{Tall homozygous}:\text{Dwarf}$

D. $3:1::\text{Tall}:\text{Dwarf}$

Answer: B

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Watch Video Solution

12. Match the terms in Column I with their description in Column II and choose the correct option

Column I	Column II
(a) Dominance	(i) Many genes govern a single character
(b) Codominance	(ii) In a heterozygous organism only one allele expresses itself
(c) Pleiotropy	(iii) In a heterozygous organism both alleles express themselves fully
(d) Polygenic inheritance	(iv) A single gene influences many characters

A. $a(iv), b(iii), c(i), d(ii)$

B. $a(ii), b(i), c(iv), d(iii)$

C. $a(ii), b(iii), c(iv), d(i)$

D. $a(iv), b(i), c(ii), d(iii)$

Answer: C

13. Pick out the correct statements

(a) Haemophilia is a sex-linked recessive disease

(b) Down's syndrome is due to aneuploidy

(c) Phenylketonuria is an autosomal recessive gene disorder.

(d) Sickle cell anaemia is a X-linked recessive gene disorder

A. (a), (b) and (c) are correct

B. (a) and (d) are correct

C. (b) and (d) are correct

D. (a), (c) and (d) are correct

Answer: A

Watch Video Solution

14. A colour blind man marries a woman with normal sight who has no history of colour blindness in her family.What is the probablity of their grandson being colour blind ?

A. 0.25

B. 0.5

C. 1

D. Nil

Answer: B

Watch Video Solution

15. the term 'linkage' was coined by :

A. W. Sutton

B. T.H. Morgan

C. T. Boveri

D. G. Mendel

Answer: B

Watch Video Solution

16. A pleiotropic gene:

A. Controls multiple traits in an individual.

B. Is expressed only in primitive plants.

C. Is gene evolved during Pliocene

D. Controls a trait only in combination with another gene

Answer: A

Watch Video Solution

17. In his classic experiment on Pea plants, Mendel did not use

A. Flower position

B. Seed colour

C. Pod length

D. Seed shape and seed colour

Answer: C

Watch Video Solution

18. A gene showing codominance has:

A. Both alleles, independently expressed in the heterozygote.

B. One allele dominant on the other

C. Alleles tightly linked on the same chromosome

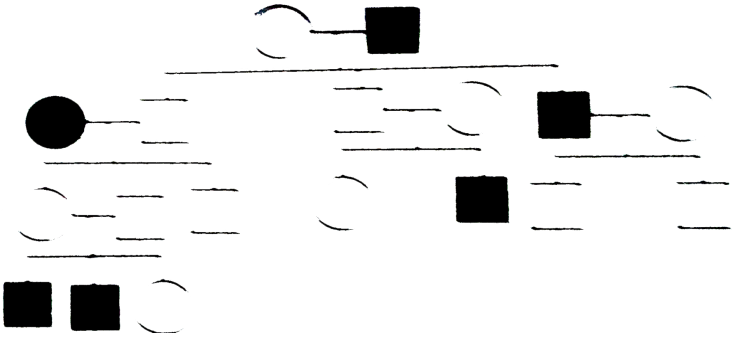
D. Alleles that are recessive to each other

Answer: A

Watch Video Solution

19. In the following human pedigree, the filled symbols represent the affected individuals. Identify the type of

given pedigree



A. X-linked dominant

B. Autosomal dominant

C. X-linked recessive

D. Autosomal recessive

Answer: D

Watch Video Solution

20. Alleles are:

A. Heterozygotes

B. Different phenotype

C. True breeding homozygotes

D. Different molecular forms of a gene

Answer: D

 Watch Video Solution

21. The movement of a gene from one linkage group to an other is called

A. Crossing over

B. Inversion

C. Duplication

D. Translocation

Answer: D

Watch Video Solution

22. Multiple alleles are present:

A. On non-sister chromatids

B. On different chromosomes

C. At different loci on the sme chromosome

D. At the same locus of the chromosome

Answer: D

Watch Video Solution

23. An abnormal human baby with XXX sex chromosomes was born due to

A. Fusion of two sperm and one ovum

B. Formation of abnormal sperms in the father

C. Formation of abnormal ova in the mother

D. Fusion on two ova and one sperm

Answer: C

Watch Video Solution

24. How many pairs of contrasting characters in pea plants were studied by Mendel in his experiments?

A. Seven

B. Five

C. Six

D. Eight

Answer: A

Watch Video Solution

25. Fruit colour in squash is an example of

A. Recessive epistasis

B. Dominant epistasis

C. Complementary genes

D. Inhibitory genes

Answer: B

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26. A man whose father was colour blind marries a woman who has a colour blind mother and normal

father .What percentage of male childern of this couple will be colour blind ?

A. 25%

B. 0%

C. 50%

D. 75%

Answer: C

Watch Video Solution

27. A human female with turner's syndrome

A. Has 45 chromosome with XO

B. Has one additional X chromosoome

C. Exhibits male characters

D. Is able to produce children with normal husband

Answer: A

28. In a population of 1000 individuals 360 belong to genotype AA, 480 to Aa and the remaining 160 to aa. Based on this data, the frequency of allele A in the population is

A. 1. 0.4

B. 2. 0.5

C. 3. 0.6

D. 6. 0.7

Answer: C

Watch Video Solution

29. If both the parents are carriers for thalassemia which is an autosomal recessive disorder what are the chances of pregnancy resulting in an affected child

A. 50 %

B. 25 %

C. 100 %

D. No chance

Answer: B

Watch Video Solution

30. The incorrect statement with regard to Haemophilia is

A. It is recessive disease

B. It is a dominant disease

C. A single protein involved in the clotting in blood is affected

D. It is sex-linked disease

Answer: B

31. If two persons with 'AB' blood group marry and have sufficiently large number of children, these children could be classified as 'A' blood group: 'AB' blood group 'B' blood group in 1:2:1 ration. Modern technique of protein electrophoresis reveals presence of both 'A' and 'B' type proteins in 'AB' blood group individuals. This is an example of

A. Incomplete dominance

B. Particle dominance

C. Complete dominance

D. Codominance

Answer: D

Watch Video Solution

32. Which Mendelian idea is depicted by a cross in which the F_1 generation re- sembles both the parents

A. Law of dominance

B. Inheritance of one gene

C. Co-dominance

D. Incomplete dominance

Answer: C

Watch Video Solution

33. which of the following statements is not true of two genes that show 50 % recombination frequency ?

A. The genes are tightly linked

B. The genes show independent assortment

C. If the genes are present on the same chromosome, they undergo more than one crossovers in every meiosis

D. The genes may be on different chromosomes

Answer: A

34. F_2 generation in Mendelian cross showed that both genotypic and phenotypic ratios are same as $1:2:1$. It represents a case of:

A. Monohybrid cross with complete dominance

B. Monohybrid cross with incomplete dominance

C. Co-dominance

D. Dihybrid cross

Answer: B

Watch Video Solution

35. A normal visioned man whose father was colour blind, marries a woman whose father was also colour blind .They have their first child as a daughter .What are the chances that this child would be colour blind ?

A. $25\ \%$

B. $50\ \%$

C. $100\ \%$

D. Zero precent

Answer: D

Watch Video Solution

36. A test cross is carried out:

A. Determine the genotype of a plant of F_2

B. Predict whether two traits are linked

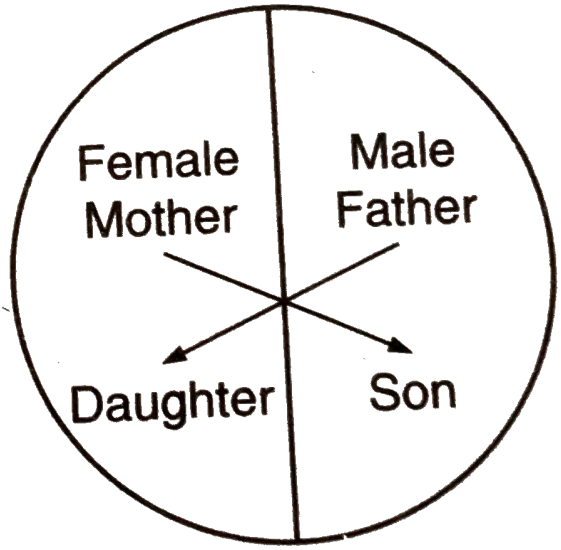
C. Assess the number of alleles of a gene

D. Determine whether two species or varieties will breed successfully

Answer: A

Watch Video Solution

37. Represented below is the inheritance pattern of certain type of traits in humans. Which one of the followings conditions could be an example of the pattern ?



A. Phenylketonuria

B. Sickle cell anaemia

C. Haemophilia

D. Thalasemia

Answer: C

Watch Video Solution

38. Which one of the following is a wrong statement regarding mutations

A. Deletion insertion of base pairs cause frameshit mutations

B. Cancer cells commonly show chromosomal aberrations

C. UV and Gamma ray are mutagens

D. Change in a single base pair of DNA does not cause mutation

Answer: D

39. Which one of the following conditions correctly describes the manner of determining the sex in the given example

A. Homozygous sex chromosomes (XX) produce male in Drosophila.

B. Homozygous sex chromosomes (ZZ) determine female sex in Birds.

C. XO type of sex chromosome determine male sex in grasshopper

D. XO condition in human as found in turner Syndrome, determine female sex.

Answer: C

Watch Video Solution

40. When two unrelated individuals or lines are crossed, the performance of F_1 hybrids is often superior to both

its parents. The phenomenon is called

A. Metamorphosis

B. Heterosis

C. Transformation

D. Splicing

Answer: B

Watch Video Solution

41. Test cross in plants or in Drosophila involves crossing:

A. The F_1 hybrid with a double recessive genotupe

B. Between two genotypes with dominant trait

C. Between the genotype with recessive trait

D. Between two F_1 hybrid

Answer: A

Watch Video Solution

42. ABO blood groups in human beings are controlled by the gene I. The gene I has three alleles $-I^A$, I^B and i. Since there are three different alleles, six different genotypes are possible

How many phenotypes can occur ?

A. Three

B. One

C. Four

D. Two type of gametes

Answer: C

Watch Video Solution

43. Which one of the following cannot be explained on the basis of Mendel's Law of Dominance?

A. Factors occur in pairs

B. The discrete unit controlling a particular character is called a factor

C. Out of the pair of factors one is dominant, and the other recessive

D. Alleles do not show any blending and both the character recover as such in F_2 generation

Answer: D

Watch Video Solution

44. The genotype of a plant showing the dominat phenotype can be determined by :

A. Back cross

B. Test cross

C. Dihybrid cross

D. Pedigree analysis

Answer: B

Watch Video Solution

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

A. Tightly liked genes on the same chromosome show very few recombinations

B. Tightly linked genes on the same chromosome show higher recombinations

C. Genes far apart on the same chromosome show vary few recombinations

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

Answer: A

Watch Video Solution

46. A cross in which an organism showing a dominant phentype is crossed with the recessive parent in order to know its genotype is called:

A. Monohybrid corss

B. Back cross`

C. Test crosses

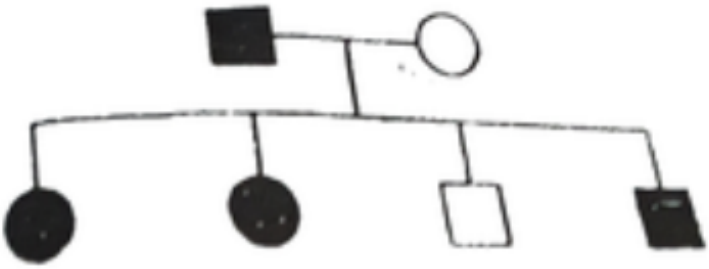
D. Dihybrid corss

Answer: C

Watch Video Solution

47. Study the pedigree chart of a certain family given below and select the correct conclusion which can be

drawn for the character



A. The female parent is heterozygous

B. The parents could do have had a normal daughter for this character

C. The trait under study could not be colourblindness

D. The male parent is homozygous dominant

Answer: A

Watch Video Solution

48. ABO blood grouping is controlled by gene I which has three alleles and show co-dominance. There are six genotypes: How many phenotypes in all are responsible

A. Six

B. Three

C. Four

D. Five

Answer: C

Watch Video Solution

49. The fruit fly Drosophila melanogaster was found to be very suitable for experimental verification of chromosomal theory on inheritance by Morgan and his colleagues because

A. It reproduces parthenogenetically

B. A single mating produces two young flies

C. Smaller female is easily recognisable from larger male

D. It completes life cycle in about two weeks

Answer: D

Watch Video Solution

50. In Antirrhinum two plants with pink flowerrs were hybridized. The F_1 plants produced red, pink and white flowers in the proportion of 1 red, 2 pink and 1 white. What could be the genotype of the two plants used for hybridization? Red flower colour is determined by RR, and white by rr genes.

A. mr

B. RR

C. Rr

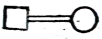
D. rr

Answer: C

Watch Video Solution

51. Which one of the following symbols and its representation, used in human pedigree analysis is correct?

A. (1) ◆ = male affected

B. (2)  = mating between relatives

C. (3) ○ = unaffected male

D. (4) □ = unaffected female

Answer: B

Watch Video Solution

52. Point (Gene mutation) mutation involves

A. Deletion

B. Insertion

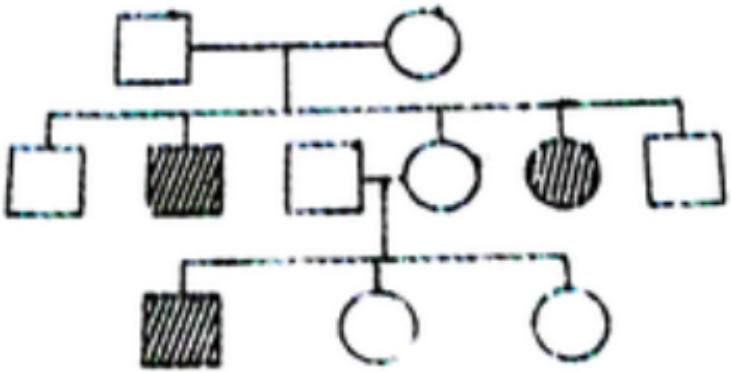
C. Change in single base pair

D. Duplication

Answer: C

Watch Video Solution

53. Study the pedigree chart given below



what does it show?

A. Inheritance of a condition like phenylketonuria as an autosomal recessive trait

B. The pedigree chart is wrong as this is not possible

C. Inheritance of a recessive sex-linked disease like haemophilia

D. Inheritance of a sex-linked inborn error of metabolism like phenylketonuria

Answer: A

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54. Select the incorrect statement from the following

A. Galactosemia is an inborn error of metabolism

B. Small population size result in random genetic drift in a population

C. Baldness is a sex-limited trait

D. Linkage is an exception to the principle of independent assortment in heredity

Answer: C

55. Haploids are more suitable for mutation studies than the diploids. This is because

A. All mutations, whether dominant or recessive are expressed in haploid

B. Haploids are reproductively more stable than diploids

C. Mutagens penetrate in haploids more effetively than diploids

D. Haploids are more abundant in nature than diploids

Answer: A

Watch Video Solution

56. Which one of the following conditions in humans is correctly matched with its chromosomal abnormality linkage ?

A. Down syndrome - 44 autosomes + XO

B. Klinefelter syndrome - 44 autosomes + XXY

C. Colour blindness - Y - linked

D. Erythroblastosis foetalis - X - linked

Answer: B

Watch Video Solution

57. In the hexaploid wheat, the haploid (n) and basic (x) numbers of chromosomes are

A. $n = 21$ and $x = 7$

B. $n = 7$ and $x = 21$

C. $n = 21$ and $x = 21$

D. $n = 21$ and $x = 14$

Answer: A

Watch Video Solution

58. Inheritance of skin colour in humans in an example of :-

A. Codominance

B. Chromosomal aberration

C. Point mutation

D. Polygenic inheritance

Answer: D

Watch Video Solution

59. A common test to find the genotype of a a hybird is by

A. Crossing of one F_1 progeny with male parent

B. Crossing of one F_2 progeny with male parent

C. Crossing of one F_2 progeny with female parent

D. Studying the sexual behaviour of F_1 progenies

Answer: A

Watch Video Solution

60. R and y genes of Maize lie very close to each other . When RRYY and rryy gneotypes are hybridised , F_2 genertion will show

A. Higher number of the parental types.

B. Higher number of the recombinant types.

C. Segregation in the expected $9:3:3:1$ ratio.

D. Segregation in $3:1$ ratio

Answer: A

Watch Video Solution

61. In pea plants, yellow seeds are dominant to green. If a heterozygous yellow seeds plant is crossed wit a green seeded plant, what ratio of yellow and green seeded plants would you expect in F_1 generation :-

A. $3:1$

B. $50:50$

C. $9:1$

D. $1:3$

Answer: B

Watch Video Solution

62. A human male produces sperms with the genotypes AB, Ab, aB, and ab pertaining to two diallelic characters in equal proportions. What is the corresponding genotype of this person?

A. AABB

B. AaBb

C. AaBB

D. AABb

Answer: B

Watch Video Solution

63. Which one of the followingt is the most suitable medium for culture of Drosophila melanogaster

A. Moist bread

B. Agar agar

C. Ripe banana

D. Cow dung

Answer: C

Watch Video Solution

64. Phenotype of an organism is result of

A. Mutation and linkages

B. Cytoplasmic effects and nutration

C. Environmental changes and sexual dimorphism

D. Genotype and environment interactions

Answer: D

Watch Video Solution

65. In which mode of inheritance do you except more maternal influence among the offspring

A. Autosomal

B. Cytoplasmic

C. Y-linked

D. X-linked

Answer: B

Watch Video Solution

66. How many different kinds of gametes will be produced by a plant having the genotype AABbCC ?

A. Three

B. Four

C. Nine

D. Two

Answer: D

Watch Video Solution

67. Which one of the following is an example of 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

Watch Video Solution

68. In Mendel's experiments with garden pea, round seed shape (RR) was dominant over wrinkled seeds (rr), yellow cotyledon (YY) was dominant over green cotyledon (yy). What are the expected phenotypes in the F_2-generation of the cross RRYY $\times$ rryy ?

A. Only round seeds with green cotytedons

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

Watch Video Solution

69. 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 genotype with dorminant trait

Answer: C

Watch Video Solution

70. If a colourblind woman marries a normal visioned man. Their sons will be

A. All normal visioned

B. One-half colourblined and one = half normal

C. Three-fourths colourblined and one -fourth normal

D. all colourblind

Answer: D

Watch Video Solution

71. Cri-du-chat syndrome in humans is caused by the :

A. Fertilization of an XX egg by normal Y-bearing sperm

B. Loss of half of the short arm of chromosome 5

C. Loss of half of the long arm of choromosome 5

D. Trisomy of 21st chromosome

Answer: B

Watch Video Solution

72. A man and a woman, who do not show any apparent signs of a certain inherited disease, have seven children (2 daughters and 5 sons). Three of the sons suffer from the given disease but none of the daughters are affected which of the following mode of inheritance do you suggest for this disease

A. Autosomal dominant

B. Sex-linked dominant

C. Sex-limited recessive

D. Sex-linked recessive

Answer: D

 Watch Video Solution

73. At a particular locus, frequency of 'A' allele is $0.6$and that of $'a'$ is 0.4 . What would be the frequency of heterozygotes in a random mating population at equilibrium ?

A. 0.16

B. 0.48

C. 0.36

D. 0.24

Answer: B

Watch Video Solution

74. A woman with normal vision, but whose father was colour blind, marries a colourblind man. Suppose that the fourth child of this couple was a boy. This boy :

A. Must have normal colour vision

B. Will be partially colourblind since he is heterozygous for the colourblind mutant allele

C. Must be colourblind

D. May be colourblind or may be of normal vision

Answer: D

Watch Video Solution

75. Haemophiliais more commonly seen in human males than in human females because

A. This disease is due to an X-linked dominant mutation

B. A greater proportion of girls die in infancy

C. This disease is due to an X-linked recessive mutation

D. This disease is due to a Y-linked recessive mutation

Answer: C

Watch Video Solution

76. A woman with 47 chromosomes due to three copies of chromosome 21 is characterized by

A. Down syndrome

B. Triploidy

C. Turner's syndrome

D. Super femaleness

Answer: A

Watch Video Solution

77. 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

Watch Video Solution

78. Which of the following is not a hereditary disease

A. Cretinism

B. Cystic fibrosis

C. Thalassaemia

D. Haemophilia

Answer: A

Watch Video Solution

79. The salivary gland Chromosomes in the dipteran larvae, are useful in gene mappin because

A. These are much longer in size

B. These are easy to stain

C. These are fused

D. They have endoreduplicated chromosomes

Answer: D

Watch Video Solution

80. Genteic variation in a population arises due to

A. Mutations only

B. Recombination only

C. Mutations as well as recombination

D. Reproductive isolation and selection

Answer: C

Watch Video Solution

81. Select the incorrect statement regarding pedigree analysis

A. It helps to trace the inheritance of a specific trait

B. It confirms that DNA is the carrier of genetic information

C. It helps to understand whether the trait in question is dominant or recessive

D. It confirms that the trait is linked to one of the autosome

Answer: B

Watch Video Solution

82. In our society women are balmed for producing female children. Choose the correct answer for the sex-determination in humans

A. Due to some defect in the women

B. Due to some defect like aspemia in man

C. Due to the genetic make up of the particular sperm which fertilizes the egg

D. Due to the genetic make up of the egg

Answer: C

Watch Video Solution

83. Down's syndrome in humans is due to

A. Two 'Y' chromosomes

B. Three 'X' chromosomes

C. Three copies of chromosome 21

D. Monosomy

Answer: C

Watch Video Solution

84. The variation/difference in the offspring of a species from their parents constitutes an important component of:

A. Genetics

B. Speciation

C. Species fixation

D. Heredity

Answer: A

Watch Video Solution

85. If two pea plants having red (dominant) coloured flowers with unknown genotypes are crossed, 75% of the flowers are red and 25% are white. The genotypic constitution of the parents having red coloured flowers will be:

A. Both homozygous

B. One homozygous and other heterozygous

C. Both heterozygous

D. Both hernizygous

Answer: C

Watch Video Solution

86. Walter sutton is famous for his contribution to :

A. Genetic engineering

B. Totipotency

C. Quantitative genetics

D. Chromosomal theory of inheritance

Answer: D

Watch Video Solution

87. A polygenic trait is controlled by 3 genes A, B and C. In a cross AaBbCc $\times$ AaBbCc, the phenotypic ratio of the offsprings was observed as :

$1:6\times:20\times:6:1$ what is the possibe value of x?

A. 3

B. 9

C. 15

D. 25

Answer: C

Watch Video Solution

88. The chromosome constitution 2n-2 of an organism represents :

A. Monosomic

B. Nullisomic

C. Haploid

D. Trisomic

Answer: B

Watch Video Solution

89. Mendel's principle of segregation means that the germ cells always receive:

A. One pair of alleles

B. One quarter of the genes

C. One of the paired alleles

D. Any pair of alleles

Answer: C

Watch Video Solution

90. Absence of one sex chromosome causes

A. Turner's syndrome

B. Klinefelter's syndrome

C. Down's syndrome

D. Tay-Sach's syndrome

Answer: A

Watch Video Solution

91. Chimera is produced due to

A. Somatic mutations

B. Reverse Mutations

C. Lethal mutations

D. Pleiotropic mutations

Answer: A

92. Haploids are more suitable for mutation studies than the diploids. This is because

A. All mutations, whether dominant or recessive are expressed in haploid

B. Haploids are reproductively more stable than diploids

C. Mutagens penetrate in haploids more effectively than diploids

D. Haploids are more abundant in nature than diploids

Answer: A

Watch Video Solution

93. Which one of the following condition in humans is correctly matched with its chromosomal

abnormality/linkage?

A. Down's syndrome - 44 autosomes + XO

B. Klinefelter's syndrome - 44 autosomes + XXY

C. Colour blindness - Y - linked

D. Erythroblastosis foetalis - X - linked

Answer: B

Watch Video Solution

94. The genes, which remains confined to differential region of Y-chromosome, are

A. Autosomal genes

B. Holandric genes

C. Corpletely sex-linked genes

D. Mutant genes

Answer: B

Watch Video Solution

95. (i) Why is colour blindness more prominent in males than females?

(ii) Why is Drosophila used extensively for genetic studies?

A. The Y-chromosomes of males have the genes for distinguishing colours

B. Genes for characters are located on the X-chromosomes

C. The trait is dominant in males and recessive in females

D. None of these

Answer: B

Watch Video Solution

96. Albinism is a congenital disorder resulting from the lack of the enzyme:

A. Tyrosinase

B. Xanthine oxidase

C. Catalase

D. Fructokinase

Answer: A

Watch Video Solution

97. An abnormal human male phenotype involving an extra Y-chromosome (XYY) is a case of

A. Edward's syndrome

B. Jacob syndrome

C. Intersex

D. Down's syndrome

Answer: B

Watch Video Solution

98. The phenomenon, in which an alleles of one gene suppresses the activity of an allele of another gene, is known as

A. Epistasis

B. Dominance

C. Suppression

D. Inactivation

Answer: A

Watch Video Solution

99. Barr body in mammals represent

A. All the heterochromatin in male and female cells

B. The Y-chromosome in somatic cells of male

C. All the heterochromatin in female cells

D. One of the two X-chromosomes in somatic cells of females

Answer: D

Watch Video Solution

100. Two dominant independently assorting genes react with each other. They are

A. Collaborative genes

B. Complementary genes

C. Duplicate genes

D. Supplementary genes

Answer: B

Watch Video Solution

101. A diseased man marries a normal woman.They get three daughters and five sons were normal . The gene of this disease is :

A. Sex-influenced disease

B. Blood group inheritance disease

C. Sex-linked disease

D. Sex-limited disease

Answer: C

Watch Video Solution

102. Person whose father is colourblind marries a lady whose mother is daughter of a colourblind man. Their children will be

A. All sons colour blind

B. Some sons normal and some colour blind

C. All colorblind

D. All normal

Answer: D

Watch Video Solution

103. In which of the following disease , the man has an extra X-chromosome ?

A. Turner's syndrome

B. Klinefelter's syndrome

C. Bleeder's disease

D. Down's syndrome

Answer: A

Watch Video Solution

104. H.J. Muller ws awarded Nobel Prize for

A. His studies on Drosophila for genetic study

B. Proving that the DNA is a genetic material

C. Discovering the linkage of genes

D. Discovering the induced mutations by X-rays

Answer: D

Watch Video Solution

105. Polygenic genes show :-

A. Different karyotypes

B. Different genotypes

C. Different phenotypes

D. None of these

Answer: C

Watch Video Solution

106. Foetal sex can be determined by examining cells from the amniotic fluid by looking for

A. Chiasmata

B. Kinetochore

C. Barr bodies

D. Autosomes

Answer: C

Watch Video Solution

107. A female fruit fly heterozygous for sex linked genes is mated with normal male fruit fly. The male specific chromosome will enter the egg cells in proportion of

A. $3:1$

B. $7:1$

C. $1:1$

D. $2:1$

Answer: C

Watch Video Solution

108. Genetic identity of a human male is determined by

A. Sex-chromosome

B. Cell organelles

C. Autosome

D. Nucleolous

Answer: A

Watch Video Solution

109. Different forms of a gene located at the same locus of chromosomes are called

A. Multiple alleles

B. Polygenes

C. Nucleus

D. Chlorplast

Answer: A

Watch Video Solution

110. After crossing two plants, the progenies are found to be male sterile. The phrnomenon is found to be maternally inherited and is due to some genes which reside in

A. Mitochondria

B. Cytoplasm

C. Nucleus

D. Chloroplast

Answer: A

Watch Video Solution

111. Albinism is known to be due to an autosomal recessive mutation. The first child of a couple with normal skin pigmentation was an albino. What is the probability that their second child will also be an albino

A. $50\ \%$

B. $75\ \%$

C. $100\ \%$

D. $25\ \%$

Answer: D

Watch Video Solution

112. How many types of genetically different gametes will be produced by a heterozygous plant having genotype AABbCc?

A. Six

B. Nine

C. Two

D. Four

Answer: D

Watch Video Solution

113. When a single gene influences more then one trait it is called

A. Pseudo dominance

B. Pleiotropic

C. Epistasis

D. None of these

Answer: B

Watch Video Solution

114. Mental retardation in man, associated with sex chromosomal abnormality is usually due to

A. Moderate increasesin Y complement

B. Large increase in Y complement

C. Reduction in X complement

D. increase in X complement

Answer: D

Watch Video Solution

115. Loss of an X-chromosome in a particular cell, during its development, results into

A. Gynandromorphs

B. Meta female

C. Triploid individual

D. Myotonic dystrophy

Answer: A

Watch Video Solution

116. If Mandel had studied 7 traits using a plant with 12 chromosomes instead of 14, he would have

A. He would not have discovered the law of independent assortment

B. He would have discovered sex linkage

C. He could have mapped the chromosome

D. He would have discovered blending or incomplete dominance

Answer: A

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117. A woman with two genes one for haemophilia and one for colour blindness on one of its X-chromosomes marries a normal man .The progeny will be

A. 50% haemophilic colour-blind sons and 50% haemophilic sons

B. 50% haemophilic daughters and 50% colour blind daughters

C. All sons and daughters haemophilic and colour-blind

D. Haemophilia and colour-blind daughters

Answer: A

 Watch Video Solution

118. In human beings, multiple genes are involved in the inheritance of:

A. Sickle cell anaemia

B. Skin colour

C. Colour blindness

D. Phenylketonuria

Answer: B

Watch Video Solution

119. Haemophilic man marries a normal woman. Their offspring will be

A. All haemophiic

B. All boys haemophilic

C. All girls haemophilic

D. All normal

Answer: D

Watch Video Solution

120. A marriage between normal visioned man and colour blind woman will produce offspring

A. Colour blind sons and 50% carrier daughters

B. 50% colourblind sons and 50% carrier daughters

C. Normal males and carrier daughters

D. Colour blind sons and carrier daughters

Answer: D

Watch Video Solution

121. In hybridization $\mathrm{Tt} \times \mathrm{tt}$ gives rise to the progeny in the ratio ?

A. $2:1$

B. $1:2:1$

C. $1:1$

D. $1:2$

Answer: C

Watch Video Solution

122. According to mendeslim which character is showing dominance:

A. Terminal position of flower

B. Green colour in seed coat

C. Wrinkled seeds

D. Green pod colour

Answer: D

Watch Video Solution

123. Due to the cross between $\mathrm{TTRr} \times \mathrm{ttrr}$ the resultant progenies show what percent of tall, red flowered plants ?

A. $50\ \%$

B. $75\ \%$

C. $25\ \%$

D. $100\ \%$

Answer: A

Watch Video Solution

124. In Drosophilia the XXY condition leads to femaleness whereas in human beings the same conditions leads to Klienfelter's syndrome in male. It proves:

A. In human beings , Y choromosome is active in sex chromosome

B. Y chromosome is active in sex determination in both human beings and Drosophila

C. In Drosophila, Y choromosome decides femaleness

D. Y chromosome of man has genes for syndrome

Answer: A

Watch Video Solution

125. Independent assortment of genes does not take place when:

A. Genes are located on homologous chromosomes

B. Genes are linked and located on same chromosome

C. Genes are located on non-homogenous chromosomes

D. All of these

Answer: B

Watch Video Solution

126. Mendel obtained wrinkled seeds in pea due to deposition of sugars instead of starch. It was due to which enzyme :-

A. Amylaae

B. Invertase

C. Diastase

D. Absence of starch branching enzyme

Answer: D

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127. Ratio of complementary genes is

A. $9:3:4$

B. $12:3:1$

C. $9:3:3:4$

D. $9:7$

Answer: D

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128. When both alleles express their effect on being present together, the phenomenon is called

A. Co-dominance

B. Dominance

C. Incomplete dominance

D. Pseudodominance

Answer: A

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129. A and B genes are linked .what shall be genotype of progeny in a cross between AB/ab and ab/ab?

A. AAbb and aabb

B. AaBb and aabb

C. AABB and aabb

D. aaBB $\times$ Aabb

Answer: B

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130. Probability of four son to a couple is : -

A. $1/4$

B. $1/8$

C. $1/16$

D. $1/32$

Answer: C

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131. If recombination frequency between AB genes a 20% and BC gene is 40% and interference is 30% in the case of double cross over than what will be coincidance under this condition ?

A. 2.4

B. 8

C. 5.6

D. 0.7

Answer: D

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132. Male XX and female XY sometime occur due to :

A. Deletion

B. Transfer of segments in X and Y chromosome

C. Aneuploidy

D. Hormonal imbalance

Answer: B

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133. Number of Barr bodies in XXXX female would be

A. 1

B. 2

C. 3

D. 4

Answer: C

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134. Inheritance would be extranuclear in case of

A. Killer Paramecium

B. Killer Amoeba

C. Euglena

D. Hydra

Answer: A

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135. Which of the following is correct match ?

A. Down's syndrome - 21^{st} chromosome

B. Sickle cell anaemia - X - chromosome

C. Haemophilia - Y-chromosome

D. Parkinson's disease - X & Y chromosome

Answer: A

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136. How many genomes types are present in a typical green plant cell?

A. More than five

B. More than ten

C. Two

D. Three

Answer: C

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137. Which of the following is the example of sex-linked disease?

A. AIDS

B. Colour blindness

C. Syphilis

D. Gonorrhoea

Answer: B

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138. Which of the following is an example of pleiotropy ?

A. Haemophilia

B. Thalassemia

C. Sickle cell anaemia

D. Colour blindness

Answer: C

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139. A gene is said to be dominant if

A. It expresses its effect only in homozygous state

B. It expresses its effect only in heterozygous condition

C. It expresses it effect both in homozygous and heterozygous condition

D. It never expresses it's effect in any condition

Answer: C

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140. On selfing a plant of F_1-generation with genotype "AABbCC", the genotypic ratio in F_2 generation will be

A. $1:2:1$

B. $1:1$

C. $9:3:3:1$

D. $27:9:9:9:3:3:3:1$

Answer: A

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141. A diseased man marries a normal woman.They get three daughters and five sons were normal . The gene of this disease is :

A. Sex linked dominant

B. Sex linked recessive

C. Sex limited character

D. Autosomal dominant

Answer: A

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142. Down's syndrome in caused by an extera copy of chromosome number 21 . What percentage of offspring is produced by an affected mother and a normal father .

A. $100\ \%$

B. $75\ \%$

C. $50\ \%$

D. 25 %

Answer: C

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143. Which of the following discoveries resulted in a Nobel Prize

A. X-rays induce sex-linked recessive lethal mutations

B. Cytoplasmic inheritance

C. Recombination of linked genes

D. Genetic engineering

Answer: A

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144. Two crosses between the same pair of genotype or phenotypes in which the sources of the gametes are reversed in one cross, is known as

A. Test cross

B. Reciprocal cross

C. Dihybrid cross

D. Reverse cross

Answer: B

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

A. Seven

B. Six

C. Five

D. Four

Answer: D

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146. Which one of the following traits of Garden Pea studied by Mendel was a recessive feature ?

A. Axial flower position

B. Green seed colour

C. Green pod colour

D. Round seed shape

Answer: B

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147. Pattern baldness, moustaches and beard in human males are example of

A. Sex-linked traits

B. Sex-limited trait

C. Sex differentiating traits

D. Sex determining traits

Answer: B

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148. In Drosophila, the sex is determined by

A. The ratio of number of X-chromosome to the sets of autosomes

B. X and Y chromosomes

C. The ratio of X-chromosomes to the pairs of autosomes

D. Whether the egg is fertilized or develops parthenogenetically

Answer: A

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149. One of the parents of a cross has mutation in mitochondria. In that cross, that parent is taken as a male. During segregation of F_2-progenies that mutation is found in

A. One-third of the progenies

B. None of the progenies

C. All the progenies

D. Fifty percent of the progenies

Answer: B

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150. Lack of independent assortment of two genes A and B in fruit fly Drosophila is due to

A. Repulsion

B. Recombination

C. Linkage

D. Crossing over

Answer: C

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151. What kind of evidence suggested that man is more closely related with chimpanzee than with other hominoid apes

A. Evidence from DNA from sex chromosomes only

B. Comparison of chromosomes morphology only

C. Evidence from fossil remains, and the fossil mitochondrial DNA alone

D. Evidence from DNA extracted from sex chromosomes , autosomes

Answer: D

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152. The recessive genes located on X-chromosome in humans are always

A. Lethal

B. Sub-lethal

C. Expressed in males

D. Expressed in females

Answer: C

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153. A male human is heterozygous for autosomal genes A and B and is also hemizygous for hemophilic gene h. what proportion of his sperms will be abh?

A. $1/8$

B. $1/32$

C. $1/16$

D. $1/4$

Answer: A

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154. A self-fertilizing trihybrid plant forms :-

A. 8 different gametes and 64 different zygotes

B. 4 different gametes and 16 different zygotes

C. 8 different gametes and 16 different zygotes

D. 8 different gametes and 32 different zygotes

Answer: A

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155. There are three genes a, b, c, percentage of crossing over between a and b is 20%, b and c is 28% and a and c is 8%. What is the sequence of genes on chromosome?

A. b,a,c

B. a,b,c

C. a,c,b

D. None of these

Answer: A

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156. The linkage map of X-chromosome of fruit fly has 66 units, with yellow body gene (y) at one end and bobbed hair (b) gene at the other end. The recombination frequency between these two genes (y and b) should be

A. $66\ \%$

B. $> 50\ \%$

C. $\leq 50\ \%$

D. $100\ \%$

Answer: C

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157. In a plant, red fruit (R) is dominant over yellow fruit (r) and tallness (T) is dominant over shortness (t). If a plant with RRTt genotype is crossed with a plant that is rrtt

A. $25\ \%$ will be tall with reed fruit

B. $50\ \%$ will be tall with red fruit

C. $75\ \%$ will be tall with red fruit

D. All the offsprings will be tall with red fruit

Answer: B

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158. A normal visioned woman, whose father is colour bline, marries a normal visioned man. What would be probability of her sons and daughters to be colour blind. ? Explain with the help of a pedigree chart.

A. $75\ \%$ colour blind

B. $50\ \%$ colour blind

C. All normal

D. All colour blind

Answer: B

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159. Hugo de Vries gave his mutation theory on organic evolution while working on :

A. Pisum sativum

B. Drosophila melanogaster

C. Oenothera lamarckiana

D. Althea rosea

Answer: C

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160. Triticale the first man made cereal crop has been obtained by crossing wheat with

A. Barley

B. Rye

C. Pearl millet

D. Sugarcane

Answer: B

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161. Out of A-T,G-C pairing bases of DNA may exist in alternate valency state owing to arrangement called

A. Frame-shift mutation

B. Tautomerisational mutation

C. Analog mutations

D. Analog substitution

Answer: B

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162. The most striking example of point mutation is found in a disease called

A. Down's syndrome

B. Sickle cell anaemia

C. Edward syndrome

D. Night blindness

Answer: B

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163. Identify the one, which causes gene mutation

A. Granoson

B. Colchicine

C. Crossing over

D. X-rays

Answer: D

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164. mutations are mainly responsible for controlling :

A. Increasing the population rate

B. Maintaining genetic continuity

C. Constancy in organisms

D. Variation in organisms

Answer: D

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165. Which of the following is the main category of mutation?

A. Somatic mutation

B. Genetic mutation

C. Heterosis

D. None of these

Answer: B

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166. Change in the sequence of nucleotide in DNA is called as

A. Mutagen

B. Mutation

C. Recombination

D. Translation

Answer: B

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167. When a cluster of genes show linkage behaviour they

A. Do not show a chromosome map

B. Show recombination during melosis

C. Do not show independent assortment

D. Induce cell division

Answer: C

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168. Genetic map is one that

A. Establishes sites of the genes on a chromosome

B. Establishes the various stages in gene evolution

C. Shows the stages during the cell division

D. Shows the distribution of various species in a region

Answer: A

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169. In a mutational event, when adenine is replaced by guanine, it is the case of

A. Frame shift mutation

B. Transcription

C. Transition

D. Transversion

Answer: C

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170. The most likely reason for the development of resistance against pesticides in insect damaging a crop is

A. Random mutations

B. Genetic recombination

C. Directed mutations

D. Acquired heritable changes

Answer: A

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171. When two genetic loci produce identical phenotypes in cis and trans position, they are considered to be

A. Multiple alleles

B. The parts of same gene

C. Pseudoalleles

D. Different genes

Answer: C

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172. Which base is responsible for hotspots for spontaneous point mutations?

A. 5-bromouracil

B. 5-methylcytosine

C. Guanine

D. Adenine

Answer: B

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173. Nucleus of a donor embryonal cell/ somatic cell is transferred to a an enucleated egg cell. Then after the formation of organim , what shall be true ?

A. Organism will have extranuclear genes of the donor cell

B. Organism will have extranuclear genes of recipient cell

C. Organism will have extranuclear genes of both donor and reciplent cell

D. Organism will have nuclear genes of recipient cell

Answer: B

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174. Genes for cytoplsmic male sterility in plants are generally located in

A. Chloroplast genome

B. Mitochondrial genome

C. Nuclear genome

D. Cytosol

Answer: B

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175. Extranuclear 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 ribosomes

Answer: A

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Assignment Section D Assertion Reason Type Questions

1. A : Turner's syndrome generally does not occur in males.

R : Foetus with 44 + YO complement generally dies.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: A

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2. A : Sickel cell anemia occurs due to the point mutation.

R : mRNA produced from $Hb(s)$ gene has GAG instead of GUG.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: C

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3. A : Holandric traits are passed from one generation to the next generation.

R : These traits appear more frequently in one sex than in other.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: C

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4. Assertion: Dominance is not an autonomous feature of a gene or the product that is has information for.

Reason : Dominance depends much on the gene product and the production of a particular phenotype from this product.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: A

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5. A : The possibility of a female becoming a haemophilic is extremely rare.

R : Mother of such a female has to be carrier and father should be haemophilio.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: A

Watch Video Solution

6. A : Polyploids with odd number of chromosomes are prepagated vegetatively.

R : Seed formation is absent due to meiotic abnormality.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: A

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7. A : The hetrozygotic female for haemophilia may transmit the disease to sons.

R : Such traits show criss-cross inheritance.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: C

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8. A : Non-allosomic genic determination of sex is found in bacteria.

R : Such traits show criss-cross inheritance.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: B

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9. A : Non-allosomic genic determination of sex is found in bacteria.

R : Sex is dependent on some environmental factors in prokaryotes.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion,

then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: C

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10. A : Crossing over is exchange of genetic material between non-homologous chromosomes.

R : it produces new linkages.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: D

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11. A : Mendel gave postulates like "principles of segregation and principles of independent assortment" after studying seven pairs of contrasting traits in garden pea.

R : He was lucky in selecting seven characters in pea that were located on seven different chromosomes.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: C

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12. A : Test cross is the tool for knowing linkage between genes.

R : Monohybrid test cross gives two phenotypes and two genotypes.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: B

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13. A : Myotonic dystrophy is is caused by recessive mutant pleiotropic gene.

R : Gene mutation leads to more synthesis of fibrillin proteins.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: D

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14. A : In snapdragon, F_1 plants do not have red or white flowers.

R : It is incomplete dominance with neither of the two alleles of a gene being dominant over each other.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: A

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15. A : en block inheritance of all genes located on the same chromosome may occur in some organisms.

R : Dihybrid test cross will have only two phenotypes.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: A

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16. A : Morgan's cross was conducted in Drosophila to locate genes on chromosome for white eye colour.

R : The cross was done between red eyed hybrid female and white eyed male.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: C

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17. A : Antlers in male deer are sex influenced traits.

R : These are controlled by autosomal genes which are influenced by the sex of bearer.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: D

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18. A : One drum stick nucleus is present in the neutrophil of normal female.

R : It is absent in the neutrophil of male.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: B

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19. A : Blood group phenotype is controlled by presence or absence of antigens present on surface coating of RBC.

R : These antigens are of three types and four in the oligosaccharides rich head regions on glycophorin.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion,

then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: B

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20. A : XO type sex determination is found in large number of insects.

R : ZW type sex determination is found in birds.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true and the reason is not the correct explanation of the assertion , then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Reason are false statements, then mark (4)

Answer: B

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