



## BIOLOGY

# BOOKS - TRUEMAN BOOK COMPANY BIOLOGY (HINGLISH)

## PRINCIPLES OF INHERITANCE AND VARIATIONS

### Mcqs

1. Small unstable variations which fluctuate on either side of an average condition are known as

A. continuuos

B. discontinuous

C. blastogenic

D. germinal

**Answer: A**



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2. Marriages in close blood relatives result into deformed babies because of receiving

A. dominant alleles

B. two copies of same recessive allele

C. a deleted piece of DNA from mother

D. two copies of dominant alleles

**Answer: B**



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3. The ultimate source of variations is

- A. natural selection
- B. sexual reproduction
- C. mutations
- D. hormonal actions

**Answer: C**



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4. Test cross is performed to know the genotype. It is cross between

A.  $F_1$  hybrid with dominant parent

B.  $F_2$  hybrid with dominant parent

C. two  $F_1$  hybrids

D. None of the above

**Answer: B**



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5. A cross between hybrid and either of any parent is called

A. test cross

B. reciprocal cross

C. monohybrid cross

D. back cross

**Answer: D**



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**6.** To see the effect of sex on inheritance, Mendel performed

A. test cross

B. cross

C. out cross

D. reciprocal cross

**Answer: C**



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7. Drosophila of plant kingdom is

- A. Arabidopsis thaliana
- B. Aspergillus (green mould)
- C. Maize
- D. All of the above

**Answer: A**



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8. Segregation of genes occurs in

- A. Embryo formation
- B. Anaphase I

C. Anaphase II

D. Metaphase II

**Answer: B**



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9. Heterozygosity protects \_\_\_\_\_ from elimination by natural selection

A. recessive alleles

B. dominant alleles

C. multiple factors

D. genomes

**Answer: A**



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10. Mendel failed to get linkage because

- A. genes of seven types of traits selected by him were located on four different chromosomes and behaved independently
- B. genes selected by him were discrete and stable
- C. genes selected by him were located on seven non homologous chromosomes
- D. pea plant does not show linkage

**Answer: A**



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11. Mendel failed to produce same result in

A. Hieracium (Hawk weed)

B. Mango

C. Drosophila

D. None of the above

**Answer: A**



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12. The garden/edible pea (*pisum sativum*) was selected by mendel for his experiments for reason/s that

- A. many varieties are available with observable alternative forms for a trait
- B. it is usually cross pollinated
- C. it is a perennial plant
- D. all are correct

**Answer: A**



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13. From a cross  $AABb \times aaBb$ , the genotypes  $AaBB:AaBb:Aabb,aabb$  are obtained in ratio

- A. 1:1:1:1
- B. 1:2:1:0

C. 0:3:1:0

D. 1:1:1:0

**Answer: B**



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**14.** The Mendelian principles of inheritance were rediscovered by

A. Sutton and Boveri

B. Hugo de Vries, Tschermak and Correns

C. Lederberg and Tatum

D. Morgan

**Answer: B**



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15. Mendel is said to be lucky because genes of seven types of traits selected by him in pea did not show

- A. linkage
- B. dominance
- C. segregation
- D. crossing over

**Answer: A**



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16. If Mendel had considered eighth trait in pea, which law might have failed?

- A. Law of segregation
- B. Law of purity of gametes
- C. Law of independent assortment
- D. law of dominance

**Answer: C**



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17. An exception (deviation) to Medelian law of idenpendent assortment is

- A. crossing over

B. incomplete dominance

C. segregation

D. linkage

**Answer: D**



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**18.** In a multiple allele system a gamete comes to have

A. several alleles

B. three alleles

C. one allele

D. two alleles

**Answer: C**



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19. A dwarf pea plant is treated with gibberellin which makes it tall. This plant is crossed with genetically pure tall plant. Phenotypic ratio in next generation shall be

- A. 3 tall : 1 dwarf
- B. 50% tall: 50% dwarf
- C. all tall
- D. all dwarf

**Answer: C**



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20. A trihybrid cross is made between two yeasts, both with genotype AaBbCc. What proportion of the offspring will be of the genotype aabbcc?

A. 0

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

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

D.  $\frac{1}{64}$

**Answer: D**



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21. A test cross distinguishes between :

A. two homozygous forms



- B. a homozygous dominant and a heterozygous form
- C. a homozygous recessive and a heterozygous form
- D. two heterozygous forms

**Answer: B**



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**22.** In man brown eyes are dominant over blue eyes. A blue eyes mother and brown eyed father have 50% blue eyes and 50% brown eyes childred. What type of cross it involved?

- A. Back cross
- B. Test cross
- C. Out cross

D. Reciprocal cross

**Answer: B**



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23. Which of the following characters of pea was not studied by mendel?

A. Height of plant

B. Size of seed

C. Colour of pod

D. Shape of pod

**Answer: B**



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24. A trihybrid ratio of 27:9:9:9:3:3:3:1 is obtained because of

- A. multiple alleles
- B. interaction of genes
- C. multiple factor inheritance
- D. independent assortment of genes

**Answer: D**



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25. Expected children of a blue - eyed (recessive ) woaman and brown -eted (doninant ) man who had a blue had a blue eyes mother are likely to be

A. all brown eyed

B. all blue eyed

C. one blue eyed and one brown eyed

D. three blue eyed and one brown eyed

**Answer: C**



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**26.** To a heterozygous curly (dominant) haired mother and straight haired father, 8 children are born. The ratio of curly and straight haired will be

A. 6 : 2

B. 4 : 4

C. 2: 6

D. 3: 5

**Answer: B**



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27. How would you produce four O'clock seeds, all of which should yield pink coloured flowers when sown?

A.  $\mathbb{R} \times rr$

B.  $Rr \times rr$

C.  $Rr \times Rr$

D.  $\mathbb{R} \times Rr$

**Answer: A**



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28. A tobacco plant heterozygous for recessive trait of albinism is selfed and 1200 seeds are obtained. How many seedlings obtained from such seeds will have parent genotype?

- A. 900
- B. 300
- C. 600
- D. 1200

**Answer: C**



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29. An individual heterozygous for two alleles ( $AaBb$ ) produces two million sperms. How many of the sperms will have both recessive alleles

A. 0.5 million

B. 1 million

C. 2 million

D. 0.25 million

**Answer: A**



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30. If a homozygous tall pistillate plant is crossed with a dwarf staminate plant, the genotype of endosperm will be

A. Tt

B. ttT

C. ttt

D. TTT

**Answer: A**



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**31.** Which one of the following individuals can produce 16 different gametes?

A. Aa Bb cc Dd

B. Aa Bb cc DD Ee Ff

C. Aa Bb Cc dd EE FF



D. Aa Bb Cc DD Ee Ff

**Answer: B**



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**32.** Which one of the following crosses shows phenotypic ratio of 3:1?

A.  $AaBb \times AaBb$

B.  $aabb \times AABb$

C.  $Aabb \times Aabb$

D.  $AaBb \times aabb$

**Answer: C**



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**33.** A cross is made between  $F_1$  (that carries two heterozygous pairs of alleles of tall and red) and a full double recessive combination for these two genes (dwarf and white). The expected progeny will have

A. all tall and red

B. tall and red, tall and white, dwarf and white in 1:2:1 ratio

C. tall and red: dwarf and white in 1:1 ratio

D. tall and red: tall and white: dwarf and red: dwarf and white flowered plants in 1:1:1:1 ratio

**Answer: D**



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**34.** A family has 5 daughters. Probability of 6th child being boy will be

A. 1 in 2

B. 1 in 5

C. 1 in 3

D. 1 in 6

**Answer: A**



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**35.** From a single ear of corn, a farmer planted 200 kernels which produced 140 tall and 40 short plants. The genotypes of these offspring are most likely

A. TT and tt only

B. TT and Tt only

C. Tt and tt only

D. TT, Tt and tt

**Answer: D**



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**36.** A pure dwarf plant was subjected to X-ray treatment, which mutated them to reach the height of a pure tall plant. This new plant was crossed with a hybrid tall. What will be the result of progeny?

A. all tall and red

B. Tall and dwarf in 1:1 ratio

C. All dwarf

D. Tall and dwarf in 2:1 ratio

**Answer: A**



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**37.** A man with pure blue eyes and pure black hair marries a woman with black eyes and red hair. (black eyes are dominant over blue eyes and black hair over red hair). What will be the probabilities of phenotypes of the children?

A. 50% with black eyes and black hair, and 50% blue eyes and black hair

B. All will be with black eyes and black hair

C. Both the above cases are possible

D. 1:1:1:1

**Answer: C**



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**38.** A couple believed that they have brought the wrong baby home from the hospital. The wife is of blood group O, her husband of group B and child of group O. could baby be theirs?

A. chances are 50%

B. chances are 100%

C. chances are 25%

D. chances are 75%

**Answer: A**



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**39.** The height of a plant is under the control of polygenic inheritance. The genotype of a plant  $A_1A_1A_0A_0$  has 56 cm and the height of plant  $a_1a_1a_0a_0$  is 26 cm. what is the contribution, of each polygene?

A. 30 cm

B. 8.5 cm

C. 15 cm

D. 7.5 cm

**Answer: D**



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**40.** In Andulassian fowl, the heterozygous condition of alleles for black plumage (B) and white (b) is blue. A blue andulassian fowl is bred to a black andulassian fowl, the proportion of the offspring will be

- A. 50% white: 50% blue
- B. 50% black: 50% blue
- C. 50% black: 50% white
- D. 25% black: 25% blue: 50% white

**Answer: B**



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41. In a dihybrid test cross the genotypic ratio of the progeny is

A. 9:3:3:1

B. 1:1:1:1

C. 1:2:1

D. 1:7:1

**Answer: B**



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42. An embryo resulting from the mating of two albino (recessive) rabbits is transplanted into the uterus of a brown rabbit. The phenotype of this transplant will most probably be

A. brown theh white spots

B. allb rown

C. white with brown spots

D. all white

**Answer: D**



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**43.** Which law of mendel holds good even in this modern period of cytogenetics?

A. Law of independent assortment

B. Law of purity of gametes

C. Law of dominance

D. al of the above

**Answer: B**



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**44.** In man brown eye is dominant over blue. A lady with brown eyes, whose father was blue eyed is married to a man with blue eyes. What percentage of her progeny will be blue eyed

A. 0

B. 0.25

C. 1

D. 0.5

**Answer: D**



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45. A monohybrid cross between two plants, one having 22cm long internodes and the other having 12 cm long internodes, produced  $F_1$  hybrids all off 18 cm long internodes. This is a case of

- A. incomplete dominance
- B. complete dominance
- C. multiple allelism
- D. recessive dominants

**Answer: A**



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46. In a breeding experiment between two parents showing the dominant the recessive phenotype of the character the offspring showed equal proportions of the dominant and recessive phenotypes. Which one of following statement must be true?

- A. Both the parents has equal number of genes for the character
- B. Both the parents carried recessive genes
- C. Both the parents were true breeding
- D. all are true

**Answer: B**



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47. If mother has 'O' blood group, child also has 'O' group.

What can be the blood group of father?

A. O

B. A

C. B

D. all are possible

**Answer: D**



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48. Father's blood group is A and his son has 'O' group. Which of the blood group can not be present in mother?

A. A

B. B

C. O

D. AB

**Answer: D**



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**49.** If father has A blood group and mother has B blood group.

The offsprings of this couple can have blood groups

A. A,B

B. B,AB

C. A,B,AB,O

D. A,B,O

**Answer: C**



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**50.** Blood group O is universal donor because

- A. it has rbc antigen to clump with any antibody of recipient
- B. it has no antibody to clump with antigen of recipient
- C. both 1 and 2
- D. no definite answer is known

**Answer: A**



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51. If an unknown blood is added to antiserum it will be of

- A. A' group if there is no clumping of RBC
- B. A' or 'AB' if there is clumping of RBC
- C. O group if there is poor clumping of RBC
- D. none of the above

**Answer: B**



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52. Blood groups are identified on the basis of antigen-antibody reactions. It is studied under

- A. serology
- B. immunity

C. pathology

D. microbiology

**Answer: A**



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**53.** A man with blood group A marries a woman having blood group AB. Which of the following types in the progeny of this couple would show that the man is heterozygous

A. Type O

B. Type A

C. Type B

D. all of these

**Answer: C**



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**54.** What will happen if blood of 'B' group is given to a patient of group 'A'?

- A. Recipient dies due to clumping of RBC of transfused blood
- B. Recipient dies due to clumping of RBC of his own
- C. Recipient remains normal
- D. None of these

**Answer: A**



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55. Which of the following should be avoided in biological marriage?

A.  $A^+$  boy and  $A^+$  girl

B.  $A^+$  boy and  $A^-$  girl

C.  $O^+$  boy and  $O^+$  girl

D.  $O^-$  boy and  $O^+$  girl

**Answer: B**



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56. A child born of parents having 'O' and 'AB' groups can not possess

A. A' group

B. AB' group

C. B' group

D. both 'AB' & 'O' group

**Answer: D**



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**57. ABO blood group system is an example of**

A. dominant-recessive relationship

B. polygenes

C. codominance

D. codominant and dominant recessive relationship

**Answer: D**



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**58. Agglutination is found in**

- A. blood plasma
- B. RBC surface
- C. WBC
- D. platelets

**Answer: B**



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59. Antiserum used in testing blood groups has

- A. antibodies
- B. antigens
- C. leucocytes
- D. RBCs

**Answer: A**



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60. Epistasis is a type of gene interaction showing

- A. Control of a phenotype by three genes
- B. masking of the effect of a gene by a nonallelic locus

C. producing a new character when two nonallelic genes happen together in an individual

D. enhancing the effect of a gene by a nonallelic gene

**Answer: B**



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**61.** Development of purple flower character when two white flower strains of sweet pea are crossed, is an example of

A. multiple factor inheritance

B. multiple allele inheritance

C. supplementary genes and gene interaction

D. complementary genes and gene interaction



**Answer: D**



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62.  $Hb^A$  and  $Hb^S$  alleles of normal and sickle cell haemoglobin are

- A. codominant alleles
- B. multiple alleles
- C. polygenic alleles
- D. cumulative alleles

**Answer: A**



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63. Consanguineous marriages (marriages between close relatives/cousins) are not advisable because

- A. more recessive defects are likely to occur
- B. more chances of blood anomalies
- C. more chances of multiple births
- D. more chances of defective dominant traits to appears

**Answer: A**



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64. Multiple gene inheritance takes into account

- A. discontinuous traits
- B. continuous traits

C. co-dominance

D. incomplete dominance

**Answer: B**



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**65.** The genes controlling the seven pea characters studied by Mendel are now investigated by Blix, to be located on four different chromosomes which are

A. 2,3,1,1

B. 1,4,5,7

C. 1,2,3,7

D. 1,3,4,7

**Answer: B**



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**66.** In  $F_2$  generation, a ratio of 1:4:6:4:1 is obtained instead of 9:3:3:1, when two pairs of genes are considered, it indicates

- A. incomplete dominance
- B. quantitative inheritance
- C. qualitative inheritance
- D. pleiotropic effect of genes

**Answer: B**



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67. Polygenic traits include

- A. skin colour and weight in human beings
- B. kernel colour in wheat
- C. cob size of maize
- D. all of the above

**Answer: D**



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68. Sickle cell anaemia is due to substitution/transversion (point mutation) in which

- A. instead of glutamic acid, valine comes at number 6th position in one of  $\beta$  chain of Hb

- B. instead of valine, glutamic acid is inserted at number 6th position of  $\beta$ -chain of Hb
- C. valine is inserted at number 6th position in  $\alpha$  chain of Hb
- D. glutamic acid is substituted by valine at number 6th position of  $\alpha$ -chain of Hb

**Answer: A**



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**69.** 12: 3: 1 ratio is due to which type of gene interaction

- A. dominant epistasis
- B. recessive epistasis
- C. supplementary gene intereaction

D. complementary gene interaction

**Answer: A**



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70. Selection will not eliminate a lethal recessive gene from a large population because

- A. there are always some heterozygote carriers of the allele
- B. gene fixation occurs in population
- C. heterozygotes are at a selective advantage
- D. rate of mutation to the lethal allele is high

**Answer: A**



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71. A modified dihybrid mendelian ratio of 9:3:4 shows

- A. supplementary genes
- B. complementary genes
- C. lethal genes
- D. duplicate

**Answer: A**



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72. Failure of one gene to express it in the presence of a non-allelic gene is known as

- A. codominance



B. hypostasis

C. incomplete dominance

D. epistasis

**Answer: B**



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**73.** If a negro marries a white skin female, the mulattoes are born. If such mulattoes intermarry, progeny will show a gradual gradation of skin colour in ratio of:-

A. 9: 3: 3: 1

B. 1: 4: 6: 4: 1

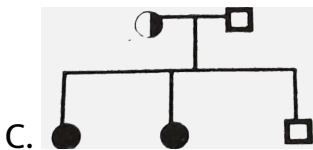
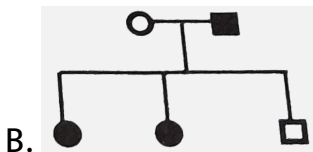
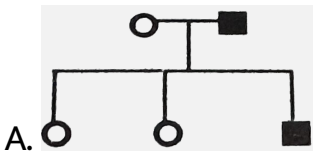
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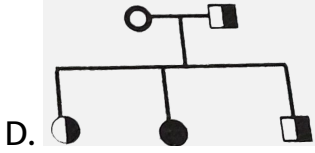
D. 1 : 6 : 15 : 20 : 15 : 6 : 1

Answer: D

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74. Wife is PTC nontaster and husband is PTC taster. Their son is taster but daughters are nontasters. This is not a sex linked trait. Which pedigree is correct?





**Answer: A**

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75. Which gene is connected with multiple phenotypes?

- A. Epistasis
- B. Pleiotropy
- C. Polygenic inheritance
- D. hypostasis

**Answer: B**

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76. If both parents are albino, all the offspring shall be

- A. albino
- B. some albino, some normal
- C. homozygous normal
- D. heterozygous normal

**Answer: A**



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77. Albinism is due to nonsynthesis (absence) of melanin on account of absence of

- A. melaninase

B. luciferase

C. tyrosinase

D. lysine

**Answer: C**



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**78.** A recessive trait in garden pea is

A. wrinkled seeds

B. tall stem

C. round seeds

D. coloured seed coat

**Answer: A**



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79. Which is correct about traits chosen by Mendel ?

- A. Terminal pod is dominant
- B. constricted pod is dominant
- C. Green coloured pod is dominant
- D. Tall plants are recessive

**Answer: C**



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80. "Gametes are never hybrid ". It is a statement of law of

- A. dominance

B. segregation

C. independent assortment

D. random fertilisation.

**Answer: B**



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**81.** 23 pairs of chromosomes can give rise to how many combinations?

A. 8.6 millions

B. 7.6 million

C. 6.6 million

D. 5.6 million

**Answer: A**



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**82.** R is dominant red flower trait while r is recessive white flower trait. Heterozygous Rr (red) is crossed with homozygous red flowered plant. 64 offspring are produced. Number of white flowered plants is:-

A. 64

B. 32

C. 16

D. 0

**Answer: D**



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83. In complementary genes, the dihybrid ratio of 9:3:3:1 is modified to

A. 0.379861111111111

B. 12: 3: 1

C. 15: 1

D. 13: 3

**Answer: A**



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84. Select the statement which is not correct?

- A. Polygenic character is controlled by multiple alleles
- B. In case of polygenic inheritance many intermediate phenotypes are found between 2-extreme ones
- C. Height, weight, skin colour are polygenic
- D. Polygenic character is controlled by multiple genes

**Answer: A**



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**85.** On selfing a plant of  $F_1$ -generation with genotype "AaBbCC", the phenotypic ratio in  $F_2$ -generation will be

- A. 3: 1
- B. 1: 1

C. 9:3:3:1

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

**Answer: A**



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**86.** Rh factor found in man and Rhesus monkey was discovered by

A. Landsteiner and Weiner

B. Willian Harvey

C. de castello and sturli

D. Rhesus

**Answer: A**



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**87.** Gene is a stable discrete unit of information (heredity). This term gene was coined by

- A. Johannsen
- B. henssen
- C. Mendel
- D. Morgan

**Answer: A**



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**88.** The type of inheritance shown by Mendel in pea is:-

- A. monogenic inheritance
- B. polygenic inheritance
- C. quantitative inheritance
- D. cytoplasmic inheritance

**Answer: A**



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**89.** A gene which can occur in more than two alternative forms present on the same locus is called

- A. polygene (multiple gene)
- B. pleiotropic gene
- C. multiple allele

D. lethal gene.

**Answer: A**



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**90.** Male honey bee has 16 chromosomes. What is the number chromosomes in worker and queen honey bee?

A.  $n=32$

B.  $2n=32$

C.  $n=16$

D.  $2n=16$

**Answer: B**



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91. Balbiani rings are found in

- A. polytene chromosomes
- B. diplotene chromosomes
- C. Z-DNA
- D. Lampbrush chromosome

**Answer: C**



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92. In plants maximum number of chromosomes ( $2n=1262$ ) are found in

- A. *Ophioglossum reticulatum*

B. *Haplopappus gracilis*

C. *Saccharum officinarum*

D. none of the above

**Answer: C**



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**93.** Unit of distance between genes in a chromosome is known as

A. C-DNA

B. Morgan

C. Centimorgan

D. Spacer



**Answer: A**



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**94.** To make a karyotype, chromosomes are photographed during :

A. fertilization

B. mitosis

C. meiosis

D. s-phase

**Answer: B**



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95. In haploids, both recessive and dominant limitations express themselves because

- A. there is single allele for each trait
- B. there are two alleles for each character
- C. there are two genes for each character
- D. there are many alleles for each trait

**Answer: A**



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96. *Drosophila* is used in the study of genetics because

- A. it is hermaphrodite
- B. generation period is 90-120 simple

C. chromosome complement is simple with three pairs of autosomes and XY sex chromosomes where Y chromosome is hooked

D. al of the above

**Answer: C**



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**97.** According to Chromosome theory of linkage of morgan and castle(1912)

A. genes lie in a linear order in the chromosomes

B. strength of linkage between two successive genes is inversely proportional to distance between two genes

C. linked genes occur on the same chromosome

D. all the above are correct

**Answer: D**



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**98.** Gynandromorphs appear in *Drosophila* because of

A. loss of X-chromosome

B. autosomal loss

C. mutation

D. gain of Y-chromosome

**Answer: A**



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**99.** In Bugs, cockroach and roundworms, the males possess

- A. one chromosome less than the female
- B. two similar sex chromosomes
- C. one chromosome different from rest
- D. a Y-chromosome

**Answer: A**



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**100.** Females are heterogametic amongst

- A. human beings

B. drosophila

C. both 1 and 2

D. birds

**Answer: D**



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**101.** Father of experimental genetics is

A. Mendel

B. Hugo de Vries

C. Morgan

D. Archibald Garrod

**Answer: C**



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**102.** Who proved that genes are located on chromosomes?

- A. Sutton and Boveri (1902)
- B. Johanssen (1909)
- C. Morgan (1910)
- D. Muller (1927)

**Answer: C**



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**103.** ZO-ZZ type of sex determination is

- A. opposite of XX-XO type

B. opposite of XX-XY

C. opposite of ZZ-ZN type

D. gynander

**Answer: A**



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**104.** Chromosome theory of inheritance was put forward by

A. Fleming (1892)

B. Sutton and Boveri independently (1902)

C. Correns (1909)

D. Boveri (1887)

**Answer: B**





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**105.** The coupling and repulsion theory of Bateson and Punnett later on modified linkage and crossing over by Morgan. Two completely linked genes show a dihybrid ratio of

A. 1:1

B. 3:1

C. 1:1:1:1

D. 9:3:3:1

**Answer: B**



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106. A dihybrid test cross ratio for two linked genes in a hybrid is

A. 1:1

B. 1:1:1:1

C. 7:1:1:7

D. 1:7:7:1

**Answer: A**



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107. Interference is

- A. decrease in frequency of crossing over because of heterochromatin
- B. chiasma at one point disfavours formation of chiasma at second point
- C. both correct
- D. none of the above

**Answer: B**



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**108.** A diploid with only one allele (e.g., man is for XY chromosomes) is known as

- A. homozygous

B. hemizygous

C. heterozygous

D. none of these

**Answer: B**



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**109.** Which of the following genetic events represents a case of incomplete linkage?

A. Expression of heterozygous phenotype which is distinct from and often intermediate to that of either parent

B. Inheritance between genes so that one gene prevents expression of other gene

- C. A condition in which the phenotypic effect of a gene's alleles are simultaneously expressed in heterozygote
- D. Occasional separation of two genes on the same chromosome by a recombinant event.

**Answer: D**



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**110.** A homozygous red eyed female was mated with white eyed male, a daughter from  $F_1$  generation was also mated with white-eyed male. Red eye is dominant over white eye and is a sex linked trait. In the progeny from this second mating.

- A. all males and females have red eyes
- B. all males and females have white eyes

C. all males have red eyes, all females have white eyes

D. males and females have red eyes and white eyes in the ratio of 1:1

**Answer: D**



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**111.** Translocation occurs during spontaneous chromosomal aberrations. During translocation there is

A. an addition of a segment of a chromosome to same chromosome

B. loss of a segment of chromosome

C. transfer of a segment of a chromosome to a different chromosome

D. all of the above

**Answer: C**



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**112.** In a linear chromosome map, distances between 4 loci is as follows, a-b 10%, a-d 3%, b-c 4% and a-c 6%. The cross over frequency between c and d is

A. 0.03

B. 0.09

C. 3 or 9%

D. 4 to 12%

**Answer: C**



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**113.** The parents of Triticale (first synthetic man made hybrid plant made by muntzing) are made hybrid plant made by muntzing) are

- A. wheat & Maize
- B. Wheat & rye
- C. Barley & rye
- D. All of these

**Answer: B**



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**114.** A haemophilic man marries a normal homozygous woman.

What is the probability that their son will be haemophilic ?

A. 1

B. 0.75

C. 0.5

D. 0

**Answer: D**

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115. A normal woman whose father was haemophilic ( $X^hY$ ) marries a normal man (XY). The offspring shall be

- A. all normal
- B. all sons haemophilic
- C. all daughters haemophilic
- D. some sons are haemophilic

**Answer: D**



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116. A woman (whose father is colour blind but mother is normal) marries a haemophiliac man with hypertichosis. What

percentage of progeny will show genotypically any two of the traits out of the three mentioned above at a given time?

A. 0

B. 0.25

C. 0.5

D. 0.75

**Answer: C**



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**117.** A recessive gene expresses only in homozygous condition. Some times, a single recessive gene can express itself when it is

A. autosomal gene

B. located on Xchromosome of female

C. located on X-chromosome of male

D. all of the above

**Answer: C**



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**118.** Of a normal couple, half of sons are haemophilic and half the daughters are heterozygous. The gene for this disease in couple are located on

A. X-chromosome of both parents

B. both the X-chromosomes of mother

C. only on the X-chromosome of mother

D. Y-chromosome of father

**Answer: C**



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**119.** A holandric gene in man causes hypertrichosis. When a man with hairy ears marries a normal woman

- A. the percentage of their sons would be 100% to have hairy ear
- B. half of daughters will have this trait
- C. ratio of hairy eared and normal child will be 1:2
- D. all correct

**Answer: A**



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120. A colour blind girl can be born when

- A. her parents have normal visions but grand parents were colour blind
- B. her mother is colour blind and father normal
- C. her mother is colour blind and father normal but grand father is colour blind
- D. her father is colour blind and mother normal but mother's father is colour blind

**Answer: D**



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121. A colour blind man marries the daughter of a colour blind lady and a normal man. Then in the progeny

- A. none of their daughters will be colour blind
- B. all her sons are colour blind
- C. all her daughters are colour blind
- D. half her sons are colour blind

**Answer: D**



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122. Both father and mother have allele for PKU but are phenotypically normal. What is the probability that their child will have the disease?

A. 0.25

B. 0.5

C. 0.75

D. 1

**Answer: A**



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**123.** A cross of white eyed female and red eyed male drosophila gives red eyed females and white eyed males. Rarely this cross may give all white eyed females and red eyed males. This was found to be due to

A. loss of a sex chromosome

B. non disjunction of X chromosomes in female



C. mutation in female fly

D. mutation in male fly

**Answer: B**



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**124.** If husband and wife both are normal in vision but fathers of both were colour blind, the probability of their first daughter to be colour blind is

A. 1

B. 0.5

C. 0

D. 0.25

**Answer: C**



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125. What will you call this set up  $2n-2+2$ ?

- A. nullisomy
- B. nullisomic tetrasomy
- C. double nullisomy
- D. double tetrasomy

**Answer: B**



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**126.** How many barr bodies Klinefelter syndrome (XXY) has?

A. 1

B. 2

C. 4

D. 3

**Answer: A**



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**127.** Which of the following does not undergo transcription of its genes?

A. Barr bodies

B. Polytene chromosome

C. Euchromatin

D. Chromosome puff

**Answer: A**



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**128.** Turner syndrome is caused by

A. autosomal Aneuploidy

B. sex chromosome aneuploidy

C. polyploidy

D. trisomy

**Answer: B**



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**129.** Down's syndrome or Mongoloid idiocy (Mongolism) is due to

- A. trisomy off X chromosome
- B. trisomy of 21st chromosome
- C. nullisomy of a chromosome
- D. monosomy of an autosome

**Answer: B**



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**130.** Phenylketonuria, Huntington's disease and sickle-cell anaemia are caused respectively due to disorders associated with

- A. chromosome 7,11,12
- B. chromosome 11,4,12
- C. chromosome 4,7,11
- D. chromosome 12,4,11

**Answer: D**



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**131.** Genetic constitution of Klinefelter syndrome is

- A. 44+XXY

B. 44+XO

C. 42+XXX

D. 44+XX

**Answer: A**



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**132.** Which one of the following conditions through harmful in itself, is also a potential saviour from mosquito borne pernicious malaria due to Plasmodium falciparium?

A. Leukemia

B. Thalassemia

C. Sickle cell anaemia

D. Pernicious anemia

**Answer: C**



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**133.** Genetic constitution of superfemale is

A.  $44+XX$

B.  $44+XXX$

C.  $44+XXY$

D.  $44+XYY$

**Answer: B**



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**134.** In human beings, male is  $44A+XY$  and female  $44A+XX$ .

Which of the following is sure case of nullisomy?

A.  $(22 \times 2) - 2A + XX$

B.  $(2 \times 22) - 2A + X$

C.  $(2 \times 22) - 2A - Y$

D.  $(2 \times 22) + 2A + XX$

**Answer: A**



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**135.** If the chromosome number of a trisomic is 25 what will be its corresponding  $3n$  number

A. 48

B. 36

C. 39

D. 37

**Answer: B**



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**136.** What would be the sex of *Drosophila* with  $3A+XXY$  genetic constitution?

A. Male

B. Female

C. Meta female

D. inter sex

**Answer: D**



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**137.** The number of barr bodies in normal male and normal female is

A. 1,0

B. 1,1

C. 0,1

D. 0,2

**Answer: C**



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138. Turner's syndrome is

- A.  $44+XO$
- B.  $44+OY$
- C. Both correct
- D. None

**Answer: A**



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139. If haploid number is 10, what would be the number of monosomic and tetrasomic conditions

- A. 10,40
- B. 19,22

C. 9,22

D. 19,40

**Answer: B**



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**140.** Down's syndrome is an example of

A. aneuploidy

B. polyteny

C. polyploidy

D. monoploidy

**Answer: A**



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141. Webbed neck' is a characteristic of :

- A. Turner's syndrome
- B. Down's syndrome
- C. Klinefelter's syndrome
- D. super female

**Answer: A**



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142. Barr body in normal female is due to inactivation of

- A. Maternally derived X chromosome

B. Paternally derived X chromosome

C. extra chromosome

D. either maternal or paternal X-chromosome

**Answer: A**



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**143.** Carrier organism refers to an individual which carries a

A. recessive gene that is not expressed

B. dominant gene that is not expressed

C. recessive gene that is expressed

D. dominant gene which is expressed

**Answer: A**



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**144.** A woman has haemophilic brother and normal parents. She wants to marry a man who has no history of haemophilia in his family. What is the possibility of her children having this disease

- A. 50% of the sons may be haemophilic
- B. 50% of the total generation will be haemophilic
- C. all will be haemophilic
- D. none of them will be haemophilic

**Answer: A**



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**145.** The grandsons of a colour blind male through daughter having the following probability of being colour blind is

- A. 0
- B. 0.5
- C. 0.25
- D. 0.125

**Answer: B**



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**146.** If the frequency of a dominant phenotype in a stable population is 75%, the frequency of recessive allele in that population would be

A. 0.375

B. 0.75

C. 0.094

D. 0.5

**Answer: D**



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**147.** If we ignore the effect of crossing over, how many different haploid cells arise by meiosis in a diploid cell having  $2n=12$

A. 8

B. 16

C. 32

D. 64

**Answer: D**



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**148.** When a mutation is limited to the substitution of one nucleotide pair of DNA, it is called as

A. deletion

B. inservation

C. inversion

D. point mutation

**Answer: A**



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**149.** Aneuploidy arises through

- A. disjunction
- B. nondisjunction
- C. inversion
- D. duplication

**Answer: B**



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**150.** Another mutation occurring in an already mutated gene gives rise to

- A. multiple genes

B. multiple alleles

C. polygenes

D. pleiotropic genes

**Answer: B**



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**151.** Haploid plants are preferred over diploids for mutation studies, because

A. haploids can easily be cultured

B. in haploids mutation can be induced

C. dominant mutations express immediately

D. recessive mutations express immediately

**Answer: A**



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**152.** Mutational events, which result in the deletion or addition of nucleotide bases in DNA, thereby causing gross changes in the amino acid sequences of proteins are termed as

- A. frame shift mutations
- B. point mutations
- C. forward or backward mutations
- D. transversions

**Answer: D**



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**153.** Which of the following mutational events is most difficult to detect?

- A. Lethal mutations
- B. Dominant mutations
- C. Recessive non lethal mutations
- D. Auxotrophic mutations

**Answer: A**



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**154.** Which of the following represents an amphidiploid (or allopolyploid) condition?

- A. A plant having a chromosome number which is not an exact multiple of the haploid number
- B. A plant derived by doubling the chromosomes of  $F_1$  hybrid of two species
- C. A polyploid containing genetically different chromosomes sets derived from two or more species
- D. A polyploid species in which the genomes have been derived from the same original species

**Answer: A**



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**155.** A polyploid species having multiple and identical sets of chromosomes is called



- A. allopolyploid
- B. amphidiploid
- C. anuploid
- D. autopolyploid

**Answer: D**



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**156.** Slight difference in identical twins support the hypothesis that

- A. dominance may be incomplete
- B. single gene may produce multiple effect

- C. the expression of genetic character is affected by environment
- D. they developed from separate fertilized eggs

**Answer: C**



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**157.** An allopolyploid has 4 or more sets of chromosomes.

These sets come from

- A. a single parental species
- B. two parental species
- C. four parental species
- D. mutations

**Answer: B**



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**158.** An organism or cell having a chromosome number exactly multiple of haploid number is known as

- A. aneuploidy
- B. euploid
- C. hypoploid
- D. hyperploid

**Answer: B**



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**159.** In *Drosophila*, XXY is female. In humans it represents a male because

- A. Y-chromosome induces male traits in humans.
- B. Y-chromosome is essential for female sex in *Drosophila*.
- C. Y-chromosome is not essential for male sex in humans.
- D. None of the above

**Answer: A**



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**160.** Queen Victoria of England was

- A. haemophiliac carrier
- B. colour blind

C. AIDS patient

D. deaf

**Answer: A**



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**161.** Number of nucleosomes found in helical coil of 30nm chromatin fibre is

A. 6

B. 10

C. 12

D. 15

**Answer: A**



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**162.** Seedless watermelons have been obtained through

- A. haploidy
- B. vegetative propagation
- C. triploidy
- D. gibberellin application

**Answer: C**



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**163.** In humans , Philadelphia chromosome is formed by reciprocal translocation between chromosomes

A. 9 and 21

B. 9 and 22

C. 9 and 20

D. 20 and 10

**Answer: B**



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**164.** Frequency of an autosomal recessive lethal gene is 0.4

Frequency of carrier in a population of 200 individuals is

A. 72

B. 96

C. 104

D. 36

**Answer: B**



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**165.** Genic balance theory holds good in case of

A. Humans

B. *Drosophila*

C. Grasshopper

D. *Allium cepa*

**Answer: B**



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166. A and B genes are linked. What shall be the 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 and AaBb

**Answer: B**



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167. A diseased man marries a normal woman. They get three daughters and five sons. All the daughters were diseased and 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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**168.** Which is the late acting dominant disorder

- A. Polydactyly
- B. Phenylketonuria
- C. Huntington's chorea
- D. Tay-sach's disease

**Answer: C**



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**169.** Z-chromosome in birds is the name for

- A. Y-chromosome in males
- B. X-chromosomes, and is paired in males
- C. X-chromosome and is unpaired in males
- D. Y-chromosome in females

**Answer: B**



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170. Which clotting factor is absent in haemophilia A?

- A. factor X
- B. factor IX
- C. factor VIII
- D. factor IV

**Answer: C**



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171. Which enzyme is defective or not formed in case of Alkaptonuria?

- A. Phenylalanine hydroxylase

B. Homogentisic oxidase

C. Tyrosine oxidation

D. All of these

**Answer: B**



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**172.** Who is known as the Father of Human Genetics?

A. F. Falton

B. Lederberg

C. Archibald Garrod

D. None of these

**Answer: C**



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**173.** In birds the female sex is

- A. homogametic
- B. digenetic
- C. heterogametic
- D. none of these

**Answer: C**



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**174.** Number of autosomes in a sperm is

- A. 2

B. 44

C. 23

D. none of these

**Answer: D**



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**175.** Sex mechanism in *Drosophila* is

A. XO female: XX male

B. XY female: XX male

C. XX female: XX male

D. none of these

**Answer: D**



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**176.** In a blood sample a WBC has a nucleus with drum-stick. This indicates that the blood sample has come from a person who is

- A. Haemophilic
- B. Diabetic
- C. Female
- D. Sickle cell-anaemic

**Answer: C**



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177. Who is known as the father of blood group studies?

- A. H F Nuttall
- B. Francis Galton
- C. Achibald Garrod
- D. Landsteiner

**Answer: D**



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178. The blood of a person having group A can not be transfused into a person of blood group B because

- A. donor has  $\beta$ -antibodies

B. recipient has B-antigen

C. both the these

D. donor has A-antigen and recipient has  $\alpha$ -antibodies

**Answer: D**



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**179.** Sex-linked inheritance was discovered by

A. Tjio and Levan in human

B. T.H. Morgan in *Drosophila*

C. Haldane through pedigree analysis in human

D. H.J. Muller in *Drosophila*

**Answer: B**



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**180.** Rh (-ve) person has

- A. Rh antigens on RBC
- B. Rh antibodies in Plasma
- C. Neither antigens nor antibodies of Rh factor
- D. both antigens and antibodies

**Answer: C**



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**181.** Trisomy of D-group chromosomes causes

- A. Cri-du-chat syndrome

B. Patau's syndrome

C. Edward syndrome

D. Achondroplasia

**Answer: B**



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**182.** Tay sach's disease is

A. Recessive and autosomal

B. Dominant and autosomal

C. Sex-linked

D. Not a hereditary disease

**Answer: A**



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**183.** Which of the following disorder shows Criss-cross inheritance ?

- A. Haemophilia
- B. Thalassemia
- C. Erythroblastosis foetalis
- D. None of these

**Answer: A**



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**184.** Number of barr bodies present in turner's syndrome is

A. 0

B. 1

C. 2

D. 2 or 3

**Answer: A**



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**185.** A male grasshopper will have a sex complement of

A. XY

B. XX

C. XO

D. YO

**Answer: C**



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**186.** Sex chromosomes are also called

A. allosomes

B. heterosomes

C. autosomes

D. isochromosomes

**Answer: A**



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**187.** 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. back cross
- B. dihybrid cross
- C. test cross
- D. reciprocal cross

**Answer: D**



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**188.** Albinism is due to nonsynthesis (absence) of melanin on account of absence of



A. Melanase

B. luciferase

C. tyrosinase

D. lysine

**Answer: C**



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**189.** Scientist who was awarded nobel prize for finding to be linearly arranged on chromosomes was

A. Wolf

B. Punnet

C. Morgan

D. Swammerdan

**Answer: C**



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**190.** Christmas disease is another name of

A. Turner syndrome

B. Down's syndrome

C. Haemosphilia B

D. Haemophiliac

**Answer: C**



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191. Two genes R and Y are located very close on the chromosomal linkage map of maize plant. When RRY Y and rryy genotypes are hybridized the  $F_2$  segregation will show

- A. segregation in the expected 9:3:3:1 ratio
- B. segregation in 3:1 ratio
- C. higher number of parental types
- D. higher number of the recombinant types

**Answer: C**



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192. In pea plants, yellow seeds are dominant to green. If a heterozygous yellow seeded plant is crossed with a green

seeded plant, what ratio of yellow and green seeded plants would you expect in  $F_1$ -generation?

- A. 9: 1
- B. 1: 3
- C. 3: 1
- D. 50: 50

**Answer: D**



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**193.** In maize, hybrid vigour is exploited by

- A. crossing of two inbred parental lines
- B. harvesting seeds from the most productive plants

C. inducing mutation

D. bombarding the seeds with DNA

**Answer: A**



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**194.** 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: D**



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**195.** A sweet pea plant with blue flowers and long pollens is test crossed. The progeny contains 300 plants with blue flowers and long pollens, 295 plants with red flower and round pollens, 80 plants with blue flower and round pollen and 85 plants with red flower and long pollens. This result is due to

- A. linkage
- B. segregation
- C. independent assortment
- D. linkage and crossing over

**Answer: D**



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**196.** Telomere repetitive DNA sequences control the function of eukaryote chromosomes because they

- A. help chromosome pairing
- B. prevent chromosome loss
- C. act as replicons
- D. are RNA transcription initiator

**Answer: B**



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

A.  $n=21$  &  $X=14$

B.  $n=21$  &  $X=7$

C.  $n=7$  &  $X=21$

D.  $n=21$  &  $X=21$

**Answer: B**



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**198.** Molecular basis of organ differentiation depends on the modulation in transcription by

A. transcription factor



B. anticodon

C. RNA polymerase

D. ribosome

**Answer: A**



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**199.** A sequential expression of a set of human genes occurs when a steroid molecule binds to the

A. DNA sequence

B. ribosome

C. transfer RNA

D. messenger RNA

**Answer: A**



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**200.** Grain colour in wheat is determined by 3 pairs of polygenes. A cross between AABBCc x aabbcc will produce progeny in  $F_2$  in what proportion that is likely to resemble either parent.

A. None

B. One third

C. Less than 5%

D. Half

**Answer: C**



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201. Heterochromatinisation takes place

- A. During fertilization
- B. Early in the gestational development
- C. Immediately before birth
- D. Prior to the onset of puberty

**Answer: B**



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202. Match list-I with list-II and select the correct answer using the codes given below the lists.

List-I (Peculiarity of Male Determining sperm)	List-II (Organism in which it is seen)
A. No sperm is needed at all.	1. Grasshopper
B. Necessarily with a Y-chromosome.	2. Honey bee
C. With haploid set of autosomes only.	3. Birds
D. With Z-chromosome.	4. <i>Drosophila</i> 5. Humans

A. A-2,B-1,C-3,D-4

B. A-5,B-2,C\_4,D-3

C. A-3,B-5,C-1,D-4

D. A-2,B-5,C-1,D-3

**Answer: D**



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**203.** Persons carrying the dominant gene(s) can taste a particular chemical and are called tasters. The others are nontasters. In a large random-mating human population at the hardy-weinberg equilibrium. There are 36% non-tasters and 64% tasters. The frequency of heterozygotes in the populations is

A. 0.06

B. 0.08

C. 0.32

D. 0.48

**Answer: D**



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**204.** A man and a woman, each carries a mutant allele for phenylketoneuria, an inborn error of metabolism. However, neither of them has this disease. The probability that their second child will suffer from phenylketoneuria is:

A. 0.25

B. 0.5

C. 0.75

D. 1

**Answer: A**



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**205.** Expression of a recessive phenotype in a deletion heterozygote is due to:

A. Pseudo-dominance

B. partial-dominance

C. super-dominance

D. co-dominance

**Answer: A**



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**206.** If two loci are 10 map units apart, assuming that no multiple cross-over has taken place, what proportion of the cells formed as a result of meiosis will contain a single crossover in the region between these two loci?

A. 0.1

B. 0.2

C. 0.3

D. 0.4

**Answer: A**



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**207.** Identify the correct number of gametes, genotypes and phenotypes respectively, produced in the self pollination of plant with genotype of  $AaBBCCDdEe$

A. 3,8,3

B. 4,9,4

C. 4,6,8

D. 4,8,4



**Answer: B**



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**208.** Natural selection can eliminate a deleterious allele, arising out of mutation, only when it is:

- A. Recessive
- B. Dominant
- C. Co-dominant
- D. Morphologically distinct

**Answer: B**



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209. In *Mirabilis*, red flowered plant crossed with white flowered one resulted in all pink flowered plants. What are the chances of appearance of red flowered plant in a cross between pink and white flowered plant?

A. Zero

B. 0.25

C. 0.5

D. 0.75

**Answer: A**



**Watch Video Solution**

210. A female rat homozygous for a recessive X-linked mutation is mated to a male with wild type phenotype. The phenotypes

of the F1 progeny will be

- A. all wild type
- B. 50% mutants irrespective of sex
- C. all females wild type and all males mutant
- D. all males wild type and all females mutant

**Answer: C**



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**211.** Erythroblastosis foetalis is caused when

- A. female is DD & male Dd
- B. female is dd & male also dd
- C. female is dd & male DD

D. all of the above

**Answer: C**



**Watch Video Solution**

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

- A. Y Chromosome is active in sex determination in both human beings and *drosophila*
- B. In *drosophila* Y-chromosome decides femaleness.
- C. Y chromosome of man have genes for syndrome.

D. In human beings Y chromosome is active in sex determination.

**Answer: D**



**Watch Video Solution**

**213.** In Mendel might have studied 7 pairs of characters in a plant with 10 chromosomes instead of 14 then

- A. he might not have discovered independent assortment
- B. he might not have discovered linkage
- C. he might have discovered crossing over
- D. he might have not observed dominance

**Answer: A**



[Watch Video Solution](#)

**214.** First child of a normal pigmented couple is albino. The possibility of a second child being an albino is

A. 0.25

B. 0.5

C. 0.75

D. 1

**Answer: A**



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215. In a hospital, on the same day-5 children were born to different couples. What is the probability of all 5 children being boys?

A.  $1/32$

B.  $1/16$

C.  $5/16$

D.  $5/32$

**Answer: A**



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216. If a plant with genotype  $R_1R_2R_0R_0$  produces potatoes of 240 gram weight, while  $r_1r_1r_0r_0$  produces potatoes 100 grams

in weight. What will be the weight of potatoes in a plant

$R_1R_1R_0r_0$ ?

A. 215g

B. 225g

C. 205g

D. 195g

**Answer: C**



**Watch Video Solution**

**217.** How many chromosomes would you find in a somatic cell of a female with webbed neck, primary amenorrhoea, small undeveloped breasts and ovaries?

A. 46



B. 47

C. 44

D. 45

**Answer: D**



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**218.** Slanting eyes, round face, mental retardation, epicanthus (eye folds) are seen in-

A. Klinefelter syndrome

B. Down's syndrome

C. Patau's syndrome

D. None of the above

**Answer: B**



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**219.** In a random mating population of 1 lac individuals-the frequency of the recessive allele is 0.4. how many individuals will have homozygous genotypes?

A. 26000

B. 52000

C. 78000

D. 36000

**Answer: B**



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**220.** In a random mating population of 1 lac individuals -75,000 individuals were seen to have black eyes (Dominant phenotype), the rest had blue eyes. How many black eyed individuals are hybrid?

- A. 0
- B. 25000
- C. 50000
- D. 75000

**Answer: C**



**Watch Video Solution**

221. 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.  $1/16$

B.  $1/4$

C.  $1/8$

D.  $1/32$

**Answer: C**



**Watch Video Solution**

222. In which one of the following combinations (1-4) of the number of chromosomes is the present day hexaploid wheat

correctly represented ?

A.

Combination	Mosomic	Haploid	Nullisomic	Trisomic
	21	28	42	43

B.

Combination	Mosomic	Haploid	Nullisomic	Trisomic
	7	28	40	42

C.

Combination	Mosomic	Haploid	Nullisomic	Trisomic
	21	7	42	43

D.

Combination	Mosomic	Haploid	Nullisomic	Trisomic
	41	21	40	43

**Answer: D**



**Watch Video Solution**

**223.** In humans, red-green colour blindness is recessive and sex-linked, while albinism is recessive and autosomal. A marriage between two homozygous parents a normal visioned albino woman and a colour blind and normally pigmented man will produce children

- A. who are all phenotypically normal visioned and have normal pigmentation
- B. half of whom are colour-blind and the other half having normal vision and all of them having normal pigmentation
- C. all of whom have normal vision, but half of whom are albino and the other half with normal pigmentation.

D. of four categories, normal visioned, pigmented, normal visioned, albino, colour blind, pigmented, colour blind, albino, all in equal proportions

**Answer: A**



**Watch Video Solution**

**224.** A plant with four heterologous pairs of chromosomes having Aa,Bb,Cc,Dd is self fertilized , the resulting genotype with aa bb cc dd genes occur according to which one of the following frequencies?

A.  $1/16$

B.  $1/64$

C.  $1/256$

**Answer: C**



**Watch Video Solution**

**225.** If a plant heterozygous for a trait  $AaBb$  ( $AB/ab$ ) is test crossed to obtain following result  $AaBb=520$ ,  $aabb=380$ ,  $Aab=46$  and  $aaBb=54$ , then two genes are how many map units apart from each other?

A. 20 units

B. 10 units

C. 50 units

D. all are wrong



**Answer: B**



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**226.** The ability of certain people to taste the chemical phenylthiocarbamide (PTC) is governed by a dominant allele  $T$ , and the inability to taste PTC by its recessive allele  $t$ . If 24% of a population is homozygous taster and 40% is heterozygous taster, what is the frequency of  $t$ ?

A. 0.3

B. 0.9

C. 0.4

D. 0.6

**Answer: D**



**227.** Go through the following statements:

- (i) a typical nucleosome contains 400 bp of DNA helix.
- (ii) The positively charged DNA is wrapped around the negatively charged histone octamer to form a structure called nucleosome.
- (iii) Histones are rich in the basic amino acid residues asparagine and valine.
- (iv) The packaging of chromatin at higher level requires additional set of proteins that collectively are referred to as nonhistone chromosomal proteins.

Find out the wrong statements:-

A. (i), (ii) & (iii)

B. (ii), (iii) & (iv)

C. (ii) & (iii)

D. (i),(iii) & (vi)

**Answer: A**



**Watch Video Solution**

**228.** What is true for night blindness and haemophilia ?

A. Nutritional deficiency disorders

B. X-linked recessive disorders

C. Autosomal recessive disorders

D. autosomal dominant disorders

**Answer: B**



**Watch Video Solution**

**229.** What is true for thalassaemia?

- A. Nutritional disorder leading to anaemia
- B. Autosomal recessive disorder leading to clotting abnormalities
- C. Autosomal recessive disorder leading to reduced haemoglobin synthesis
- D. Autosomal dominant disorder leading to reduced haemoglobin synthesis

**Answer: C**



**Watch Video Solution**

**230.** In X-linked recessive inheritance, why does the disease gene often appear to skip generations?

- A. x-linked diseases are only expressed in males
- B. All X-linked diseases display incomplete penetrance
- C. Disease is primarily transmitted through unaffected carrier females
- D. Males with an affected gene may transmit but not show the disease

**Answer: C**



**Watch Video Solution**

**231.** If a mother and father both have one mutant gene for a disease with an autosomal dominant inheritance, what is their

risk of having an affected child?

A. 0

B. 0.25

C. 0.5

D. 0.75

**Answer: D**



**Watch Video Solution**

**232.** Which on the four couples claiming the baby with O+ blood type are possible the biological parents of it ?

A. AB- and A+

B. A+ and O-

C. O+ and AB+

D. B- and O-

**Answer: B**



**Watch Video Solution**

**233.** The weight of fruit in a plant is determined by the number of dominant alleles of a certain number of genes. If seven weight categories are noticed, how many gene sites would be involved?

A. two

B. three

C. four

D. five

**Answer: B**



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**234.** A plant of  $F_1$  generation with genotype  $AABbCC$ . On selfing of this plant what is the phenotypic ratio in  $F_2$  generation?

A. 1:1

B. 9:3:3:1

C. 1:2:1

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

**Answer: C**



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**235.** In a population of 2000 individuals, 900 individuals are suffering from a recessive autosomal disease and 500 are carriers. The gene frequency of recessive gene is

- A. 0.45
- B. 60.5 %
- C. 0.67
- D. 0.5

**Answer: C**



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**236.** In an organism,  $4n=100$ . the haploid and monoploid number of chromosomes in this organism will be

A. 25 & 25

B. 25 & 50

C. 50 & 25

D. 50 & 50

**Answer: C**



**Watch Video Solution**

**237.** In man, nucleolar organisers are not located in which of the following chromosomes?

A. 14

B. 20

C. 21

D. 13

**Answer: B**



**Watch Video Solution**

**238.** A dihybrid test cross ratio for two linked genes in a hybrid is

A. 1:1

B. 1:1:1:1

C. 7:1:1:7

D. 1:7:7:1

**Answer: A**



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**239.** Colour blindness is characterized by

- A. absence of rod cells in retina
- B. absence of cone cells in retina
- C. absence of lustre of lens
- D. lack of colour pigments in the eye

**Answer: D**



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**240.** In human beings, sex determination has recently been studied in great detail using techniques of molecular biology.

The most important gene located on Y chromosome and involved in sex determination is:-

- A. SRY gene
- B. SXL gene
- C. ZFY gene
- D. Tra gene

**Answer: A**

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**241.** Nucleosomes give beaded appearance to chromosomes. They help in packing of DNA in the chromosomes. A nucleosome has

- A. about 5 turns of DNA

- B. 8 histone molecules of 4 types (2 mols each of  $H_2a$ ,  $H_2b$ ,  $H_3$  and  $H_4$ )
- C. 400 nitrogen base pairs
- D. all of the above

**Answer: B**



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**242.** The two nucleosomes are joined by linker DNA to which is attached

- A.  $H_1$
- B.  $H_2$
- C.  $H_3$

D.  $H_4$

**Answer: A**



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**243.** Which among the following histone proteins is least conserved in course of evolution?

A.  $H_4$

B.  $H_3$

C.  $H_2$

D.  $H_1$

**Answer: D**



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**244.** In the region of Balbiani rings (puffs), DNA strand is uncoiled. It helps in

- A. multiple transcription (synthesis) of RNA for rapid protein synthesis
- B. more synthesis of a particular intron
- C. both 1 and 2
- D. both wrong as giantness chromosomes is hereditary

**Answer: A**



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**245.** Salivary glands chromosome were discovered by Balbiani (1881) from the salivary glands of larva of

- A. Chironomid
- B. Drosophila
- C. Silk worm
- D. Lac worm

**Answer: A**



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**246.** In which stage, you will find lampbrush chromosomes in oocyte of frog?

- A. In zygotene stage

B. Pachytene stage

C. In diplotene stage

D. Oocyte after fertilization

**Answer: C**



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**247.** Polytene chromosome becomes giant due to

A. polyploidy

B. cancer

C. nondisjunction

D. endoduplication

**Answer: D**



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**248.** The major amino acids in histone protein of chromosomes are

- A. histidiine and tryptophan
- B. arginine and lysine
- C. tyrosine and tryptophan
- D. cystine and tyrosine.

**Answer: B**



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**249.** Term chromosome was coined by

A. Waldeyer

B. Strasburger

C. hofmeister

D. sanger & altman

**Answer: A**



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**250.** Acentric chromosome at mitotic anaphase will

A. have circular chape

B. by highly condensed

C. lie near the equator and will be left behind

D. be condensed and would lie at one of the poles.

**Answer: C**



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**251.** Chromatin is composed of

- A. DNA+histone
- B. DNA+RNA+histone
- C. DNA+small amounts of RNA
- D. DNA+RNA+histone and nonhistone proteins.

**Answer: D**



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252. Secondary constriction in chromosome is referred to as

- A. centromere
- B. nucleolar organiser
- C. balbiani puffs
- D. centriole

**Answer: B**



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253. Sickle cell anemia is

- A. caused by a change in a single base pair of DNA

B. characterized by elongated sickle like RBCs with a nucleus

C. an autosomal linked dominant trait

D. caused by substitution of valine by glutamic acid in the beta globin chain of haemoglobin

**Answer: A**



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**254.** The most popularly known blood grouping is the ABO grouping. It is named ABO and not ABC, because "O" in it refers to having

A. One antibody only-either anti-A or anti-B on the RBCs

B. No antigens A and B on RBCs

C. Other antigens besides A and B on RBCs

D. Overdominance of this type of the genes for A and B types

**Answer: B**



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**255.** Select the incorrect statement from the following

A. Small population size results in random genetic drift in a population

B. Baldness is a sex-limited trait



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

D. Galactosemia is an inborn error of metabolism

**Answer: B**



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**256.** 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 one pair of factor one is dominant, and the other is recessive.

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

**Answer: D**



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**257.** The genotype of a plant showing the dominant phenotype can be determined by:

A. Back cross

B. Test cross

C. Dihybrid cross

## D. Pedigree analysis

**Answer: B**



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

- A. Tightly linked 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 very few recombinations

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

**Answer: A**



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

A. (1)  $\blacklozenge$  = male affected

B. (2)  $\square \text{---} \circ$  = mating between relatives

C. (3)  $\circ$  = unaffected male

D. (4)  $\square$  = unaffected female

**Answer: B**



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**260.** Which one of the following statement about the particular entity is true ?

- A. Centromere is found in animal cells, which produces aster during cell division
- B. the gene for producing insulin is present
- C. Nucleosome is formed of nucleotides
- D. DNA consists of a core of eight histones

**Answer: B**



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**261.** In *Antirrhinum* two plants with pink flowers 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 rr genes

A. rrrr

B. RR

C. Rr

D. rr

**Answer: C**



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**262.** 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 possible?

- A. Six
- B. Three
- C. Four
- D. Five

**Answer: C**



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**263.** 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 recognizable from larger male
- D. It completes life cycle in about two weeks

**Answer: D**



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**264.** The total amount of DNA in human diploid cells is not dissimilar from that of chimpanzee but the diploid number of chromosomes in chimpanzee is

- A. 44



B. 46

C. 48

D. 50

**Answer: C**



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

A. Homozygous sex chromosomes (ZZ) determine female sex in birds

B. XO type of sex chromosomes determine male sex in grasshopper

C. XO condition in humans as found in turner syndrome, determines female sex

D. Homozygous sex chromosomes (XX) produce male in *Drosophila*

**Answer: B**



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**266.** What are those structures that appear as 'beads-on-string' in the chromosomes when viewed under electron microscope?

A. genes lie in a linear order in the chromosomes

B. Nucleotides

C. Nucleosomes

D. Base pairs

**Answer: C**



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**267.** When two unrelated individuals or lines are crossed, the performance of  $F_1$  hybrid is often superior to both its parents.

This phenomenon is called:

A. Heterosis

B. Transformation

C. Splicing

D. Metamorphosis

**Answer: A**



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**268.** Test cross in plants or in *Drosophila* involves crossing

- A. Between two genotypes with recessive trait
- B. Between two  $F_1$  hybrids
- C. The  $F_1$  hybrid with a double recessive genotype
- D. Between two genotypes with dominant trait

**Answer: C**



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**269.** Which one of the following conditions of the zygotic cell would lead to the birth of a normal human female child?

- A. two X chromosomes
- B. Only one Y chromosome
- C. Only one X chromosome
- D. One X and one Y chromosome

**Answer: A**



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**270.** If a colour blind man marries a woman who is normal but carries this trait, the progeny will be

- A. sons and daughters will be normal

B. sons will be colour blind, daughters will be normal

C. sons will be normal, daughters will be carriers

D. both sons and daughters will be color blind

**Answer: C**



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**271.** If  $F_1$  generation has all tall plants and ratio of  $F_2$  generation is 3 tall : 1 dwarf, it proves

A. Law of independent assortment

B. law of segregation

C. law of dominance

D. incomplete dominance

**Answer: B**



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**272.** Multiple phenotype is seen in

- A. dominance relationship
- B. particulate inheritance
- C. monogenic inheritance
- D. polygenic inheritance

**Answer: D**



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**273.** Mitotic chromosomes are stained with

- A. safranin
- B. fast green
- C. amido blue
- D. Acetocarmine

**Answer: D**



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**274.** The term genetics was coined by

- A. G.J. mendel
- B. William Bateson



C. H.D. vries

D. A.V. Leeuwenhoek

**Answer: B**



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**275.** 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. zero percent

B. 0.25

C. 0.5

D. 1

**Answer: A**



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

- A. Dihybrid cross
- B. Monohybrid cross with complete dominance
- C. Monohybrid cross with incomplete dominance
- D. Co-dominance

**Answer: C**



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277. A test cross is carried out:

- A. Assess the number of alleles of a gene
- B. Determine whether two species or varieties will breed successfully
- C. determine the genotype of a plant at  $F_2$
- D. Predict whether two traits are linked

**Answer: C**



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278. A woman with straight hair mates with man with curly hair who is known to be heterozygous for that trait. What is the chance that their first child will have curly hair?

A. No chance

B. One in two

C. It is certain

D. One in four

**Answer: B**



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**279.** Which of the following crosses and resultant phenotypic ratios are mismatched?

A.  $Tt \times Tt$  % 3:1

B.  $tt \times Tt$  % 2:1

C.  $TtYy \times ttyy$  % 1:1:1:1

D. TtYy x TtYy% 9:3:3:1

**Answer: B**



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**280.** The segment of DNA which participates in crossing over is termed as

A. Recon

B. Cistron

C. Muton

D. Operon

**Answer: A**



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**281.** Lampbrush chromosomes are giant chromosomes which are commonly seen in

- A. Salivary glands of Chironomous
- B. Salivary glands of Drosophila
- C. Oocytes of sharks
- D. Gametes of Drosophila

**Answer: C**



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**282.** In which type of chromosome, one arms is very long and one arm is very short

- A. Acrocentric
- B. Metacentric
- C. Submetacentric
- D. Telo centric

**Answer: A**



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**283.** Highest number of chromosomes is found in the gamete of  
of

- A. Onion
- B. Potato
- C. Rice

D. Ophioglossum

**Answer: D**



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**284.** X-chromosomes or X-body was first observed by

A. Mendel-1901

B. Castle-1910

C. Henking-1891

D. Bateson-1906

**Answer: C**



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**285.** In a hardy-Weinberg population, if gene has only two alleles A and A, and the gene frequency of allele A is 0.4. What is the frequency of gene 'a'?

A. 0.6

B. 0.48

C. 0.16

D. 0.36

**Answer: A**



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**286.** If both parents are carriers for thalessemia, which is an autosomal recessive disorder, what are the chances for

pregnancy resulting in an affected child?

A. 0.25

B. 1

C. no chance

D. 0.5

**Answer: A**



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**287.** which mendelian idea is depicted by a cross in which the F1 generation resembles both the parents

A. inheritance of one gene

B. co-dominance

C. incomplete dominance

D. law of dominance

**Answer: B**



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**288.** The incorrect statement with regard to haemophilia is

A. It is a dominant disease

B. A single protein involved in the clotting of blood is affected

C. it is a sex-linked disease

D. it is a recessive disease

**Answer: A**



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**289.** Which of the following statements is not true of two genes that show 50% recombination frequency?

- A. The genes show independent assortment
- B. if the genes are present n the same chromosome, they undergo more than one crossovers in every meiosis
- C. the genes may be on different chromosomes
- D. the genes are tightly linked

**Answer: D**



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**290.** A man whose father was colour blind marries a woman who has a colour blind mother and normal father .What percentage of male children of this couple will be colour blind ?

A. 0.75

B. 0.25

C. 0

D. 0.5

**Answer: D**



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**291.** 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. 0.7

B. 0.4

C. 0.5

D. 0.6

**Answer: D**



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**292.** A human female with turner's syndrome

A. Is able to produce children with normal husband

- B. Has 45 chromosomes with XO
- C. has one additional X chromosome
- D. Exhibits male characters

**Answer: B**



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**293.** Fruit colour in squash is an example of

- A. Inhibitory genes
- B. recessive epistasis
- C. Dominant epistasis
- D.

**Answer: C**



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

- A. six
- B. eight
- C. seven
- D. five

**Answer: C**



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**295.** The exchange of one part of a chromosome to the other part of some or another chromosome is called

Or

The movement of gene from one linkage group to another is called

- A. duplication
- B. translocation
- C. crossing over
- D. inversion

**Answer: B**



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**296.** Multiple alleles are present

- A. at different loci on the same chromosome
- B. at the same locus of the chromosome
- C. on non-sister chromatids
- D. on different chromosomes

**Answer: B**



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**297.** An abnormal human baby with  $XXX$  sex chromosomes was born due to

- A. formation of abnormal ova in the mother

- B. fusion of two ova and one sperm
- C. fusion of two sperms and one ovum
- D. formation of abnormal sperms in the father

**Answer: A**



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**298.** Alleles are:

- A. true breeding homozygotes
- B. different molecular forms of a gene
- C. heterozygotes
- D. different phenotypes

**Answer: B**



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**299.** A gene showing codominance has

- A. one allele dominant on the other
- B. alleles tightly linked on the same chromosome
- C. alleles that are recessive to each other
- D. both alleles independently expressed in the heterozygote

**Answer: D**



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**300.** The term "linkage" was coined by

A. T.H. Morgan

B. T. Boveri

C. G.Mendel

D. W. Sutton

**Answer: A**



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**301.** Select the wrong statement

A. The viroids were discovered by D.J. Ivanowski

B. W.M. Stanley showed that viruses could be crystallized

C. the term 'contagium vivum fluidum' was coined by M.W.

Beijerinck

D. Mosaic disease in tobacco and AIDS in human beings are caused by viruses

**Answer: A**



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

A. 0.5

B. 1

C. Nil

D. 0.25

**Answer: D**



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

- A. seed colour
- B. pod length
- C. seed shape
- D. flower position

**Answer: B**



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**304.** A pleiotropic gene

- A. is expressed only in primitive plants
- B. is a gene evolved during pliocene
- C. controls a trait only in combination with another gene
- D. controls multiple traits in an individuals

**Answer: D**



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**305.** A plant species A has a diploid number of chromosomes as 12. Another plant species B has a diploid chromosome number off 16. The allopolyploid developed. By hybridization of A and B shall have a diploid chromosome number as



A. 14

B. 28

C. 40

D. 58

**Answer: B**



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**306.** In a testcross involving  $F_1$  dihybrid flies, more parental-type offspring were produced than the recombinant-type offspring. This indicates

A. chromosomes failed to separate during meiosis

B. the two genes are linked and present on the same chromosome

C. both of the characters are controlled by more than one gene

D. the two genes are located on two different chromosomes

**Answer: B**



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**307.** A cell at telophase stage is observed by a student in a plant brought from the field. He tells his teacher that this cell is not like other cells at telophase stage. There is no formation of cell plate and thus the cell is containing more number of

chromosomes as compared to other dividing cells. This would result in

- A. polyploidy
- B. somaclonal variation
- C. Polyteny
- D. aneuploidy

**Answer: A**



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**308.** Which of the following most appropriately describes haemophilia?

- A. X-linked recessive gene disorder

- B. chromosomal disorder
- C. Dominant gene disorder
- D. Recessive gene disorder

**Answer: A**



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**309.** Which of the following statements is not true for cancer cells in relation to mutations

- A. Mutations destroy telomerase inhibitor
- B. Mutation inactivate the cell control
- C. Mutations inhibit production of telomerase
- D. Mutations in proto-oncogenes accelerate the cell cycle

**Answer: C**



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**310.** A tall true breeding garden pea plant is crossed with a dwarf true breeding garden pea plant. When the  $F_1$  plants were selfed the resulting genotypes were in the ratio of

A. 1 : 2 : 1 :: tall heterozygous: tall homozygous : dwarf

B. 3 : 1 : : tall: dwarf

C. 3 : 1 : : dwarf: tall

D. 1 : 2 : 1 :: tall homozygous: tall heterozygous: dwarf

**Answer: D**



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**311.** Pick out the correct statement

(I) Haemophilia is a sex-linked recessive disease

(II) Down's syndrome is due to aneuploidy

(III) Phenylketonuria is an autosomal recessive gene disorder It

brgt (IV) Sickle-cell anaemia is an X-linked recessive gene disorder

A. (ii) & (iv) are correct

B. (i), (iii) and (iv) are correct

C. (i), (ii) and (iii) are correct

D. (i) and (iv) are correct

**Answer: C**



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**312.** Which one of the following generates new genetic combinations leading to variation ?

- A. Vegetative reproduction
- B. Parthenogenesis
- C. Sexual reproduction
- D. Nucellar polyembryony

**Answer: C**



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**313.** 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 of its own kind

D. always homozygous recessive in its genetic constitution

**Answer: C**



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**314.** 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**



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

A. 1856-1863

B. 1840-1850

C. 1857-1859

D. 1870-1877

**Answer: A**



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

- A. Stem-Tall or Dwarf
- B. Trichomes-Glandular or non-glandular
- C. Seed-Green or Yellow
- D. Pod-inflated or Constricted

**Answer: B**



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**317.** 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**



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**318.** The association of histone H1 with a nucleosome indicates

- A. Transcription is occurring

B. DNA replication is occurring

C. The DNA is condensed into a chromatin fibre.

D. The DNA double helix is exposed.

**Answer: C**



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**319.** Thalassaemia 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. Sickl cell anemia is due to a quantitative problem of globin molecules

**Answer: C**



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**320.** 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**



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**321.** Which of the following characteristics represent 'Inheritance of blood groups' in humans?

a. Dominance

b. Co-dominance

c. Multiple allele

d. Incomplete dominance

e. Polygenic inheritance

A. (a), (c) and (e)

B. (b), (d) and (e)

C. (a), (b) and (c)

D. (b), (c) and (e)

**Answer: C**



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**322.** A woman has an X-linked condition on one of her X chromosomes . This chromosome can be inherited by

A. Both sons and daughters

B. Only grandchildren

C. Only sons

D. Only daughters

**Answer: A**



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