RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308

Time : 1 Mins **PRINCIPLES OF INHERITANCE AND VARIATION 1** **Marks : 1493**

1. A man with blood group 'A' marries a woman with blood group 'B'. What are all the possible blood groups of their offsprings?
   a) A, B and AB only b) A, B, AB and O c) O only d) A and B Only
2. Fruit colour in squash in an example of_____
   a) Recessive epistasis b) Dominant epistasis c) Complementary genes
   d) Inhibitory genes
3. Under which of the following conditions will there be no change in the reading frame of following mRNA?
   5'AACAGCGGUGCUAUU3"
   a) Deletion of G from 5th position
   b) Insertion of A and G at 4th and 5th positions respectively
   c) Deletion of GGU from 7th, 8th and 9th positions d) Insertion of G at 5th position
4. Which one is the incorrect match?
   a)  - Consanguineous mating b)  - Sex unspecified c)  - Male
   d)  - Affected individuals
5. If a colour blind man marries woman who is homozygous for normal colour vision, the probability of their son being colour blind is.
   a) 1 b) 0 c) 0.5 d) 0.75
6. A tall true breeding garden pea plant is crossed with a dwarf true breeding garden pea plant. When the Fl plants were selfed, the resulting genotype 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
7. What is the genetic disorder in which an individual has an overall masculine development gynaecomastia, and is sterile?
   a) Klinefelter's syndrome b) Edward syndrome c) Down's syndrome
   d) Turner's syndrome
8. Select the corect statement:
   a) Spliceosomes take part in translation
   b) Punnet square was developed by a British scientist.

c) Franklin Stahl coined the term "linkage".
d) Transduction was discovered by S. Altman.

9. Father of a child is colourblind and mother is carrier for colourblindness, the probability of the child being colour blind is:
   a) 25% b) 50% c) 100% d) 75%

10. Match column I with column II and select the correct option from the given codes.

Column I	**Column II**
A. Sickle cell anaemia	(i) 7^{th} chromosome
B. Phenylketonuria	(ii) 4^{th} chromosome
C. Cystic fibrosis	(iii) 11^{th} chromosome
D. Huntington's disease	(iv) X-chromosome
E. Colourblindness	(v) 12^{th} chromosome

   a) A-(iii), B-(v), C-(ii), D-(i), E-(iv) b) A-(iii), B-(v), C-(i), D-(ii), E-(iv)
   c) A-(v), B-(iv), C-(ii), D-(iii), E-(i) d) A-(iv), B-(ii), C-(iii), D-(i), E-(v)

11. Which one of the following traits of garden pea studied by Mendel was a recessive feature?
   a) Round seed shape b) Axial flower position c) Green seed colour
   d) Green pod colour

12. Which of the following will not result in variations among siblings?
   a) Independent assortment of genes b) Crossing over c) Linkage d) Mutation

13. A colourblind mother and normal father would have_____
   a) colour blind sons and normal/carrier daughters b) colour blind sons and daughters
   c) all colour blind d) all normal

14. Two non-allelic genes produce new phenotype when present together but fail to do so independently are called?
   a) Epistatsis b) Polygene c) Non-complimentary genes d) Complimentary genes

15. Which of the following is correct match?
   a) Down's syndrome - 21 st chromosome b) Sickle cell anaemia - X-chromosome
   c) Haemophila Y-chromosome d) Parkinson disease - X & Y chromosome

16. Some of the dominant traits studied by Mendel were
   a) round seed shape, green seed colour and axial flower position
   b) terminal flower position, green pod colour and inflated pod shape
   c) violet flower colour, green pod colour, round seed shape
   d) wrinkled seed shape, yellow pod colour, and axial flower position

17. What are the chances of this couple's fifth child being an albino?
   a) 1 in 1 b) 1 in 2 c) 1 in 3 d) 1 in 4

18. Christmas disease is another name for ____
   a) sleeping sickness b) haemophilia c) hepatitis B d) Down's synchome

19. Mendel's last law is_____
    a) segregation b) dominance c) independent assortment d) polygenic inheritance
20. 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 factors one is dominant, and the other recessive
    d)
    Alleles do not show any blending and both the characters recover as such in F_2 generation
21. In a dihybrid cross, if you get 9: 3: 3: 1 ratio it denotes that
    a) the alleles of two genes are interacting with each other
    b) it is a multigenic inheritance c) it is a case of multiple allelism
    d) the alleles of two genes are segregating independently.
22. Which base is responsible for hotspots for spontaneous point mutations?
    a) Guanine b) Adenine c) 5-bromouracil d) 5-methylcytosine
23. Law of independent assortment can be explained with the help of
    a) dihybrid cross b) test cross c) back cross d) monohybrid cross.
24. When dominant and recessive alleles express itself together it is called____
    a) codominance b) dominance c) amphidominace d) pseudodominance
25. Refer to the given table of contrasting traits in pea plants studied by Mendel

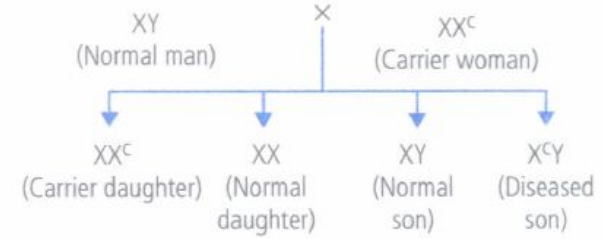
Character	Dominant trait	Recessive trait
(i) Seed colour	 Yellow	 Green
(ii) Flower colour	 Violet	 White
(iii) Pop shape	 Full	 Constricted
(iv) Flower position	 Axial	 Terminal

    Which of the given traits is correctly placed?

a) (i), (ii) and (iii) only b) (ii), (iii) and (iv) only c) (ii) and (iii) only
d) (i), (ii), (iii) and (iv)

26. Experimental verification of the chromosomal theory of inheritance was done by _____ .
a) Boveri b) Morgan c) Mendel d) Sutton

27. Inheritance of which of the following traits is shown in the given cross?



a) X-linked dominant trait b) X-linked recessive trait c) Autosomal recessive trait
d) Autosomal dominant trait

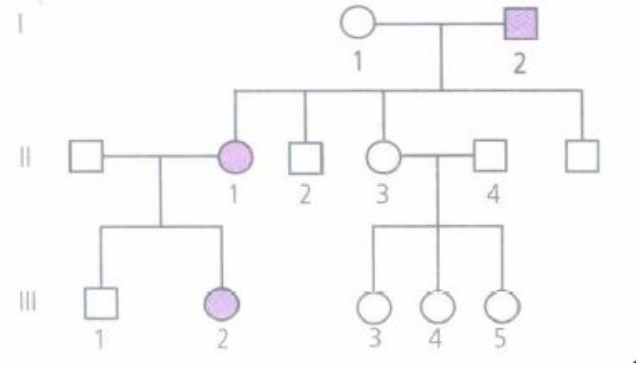
28. A child of blood group O cannot have parents of blood groups _____ .
a) AB and AB/O b) A and B c) B and B d) O and O

29. **Assertion:** The maximum frequency of recombination, that can result from crossing over between linked genes, is 50 percent.
Reason: Linked genes shown higher frequency of crossing over if distance between them is longer.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

30. Which three scientists independently rediscovered Mendel's work?
a) Avery, McLeod, McCarty b) Sutton, Morgan and Bridges
c) Bateson, Punnet and Bridges d) de Vries, Correns and Tschermak

31. Distance between the genes and percentage of recombination shows
a) a direct relationship b) an inverse relationship c) a parallel relationship
d) no relationship

32. Fused ear lobes appear in the progeny due to an autosomal recessive gene. Work out the genotypes of members in the given pedigree.



a)

I-2	II-3	III-1
aa	Aa	Aa

b)

I-2	II-3	III-1
aa	AA	AA

c)

I-2	II-3	III-1
Aa	Aa	Aa

d)

I-2	II-3	III-1
aa	Aa	AA

33. The salivary gland chromosomes in the dipteran larvae, are useful in gene mapping because _____ .

a) these are fused b) these are much longer in size c) these are easy to stain

d) They have endoreduplicated chromosomes

34. Find the correct match:

	Column I		Column II
a	Phenotype	i	Mendel
b	Father of genetics	ii	Johanssen
c	Heterozygous	iii	Correns
d	Incomplete dominance	iv	Bateson

a) a(ii), b(i), c(iv), d(iii) b) a(ii), b(i), c(iii), d(iv) c) a(iv), b(i), c(iii), d(ii)

d) a(i), b(ii), c(iii), d(iv)

35. If linkage was known at the time of Mendel then which of the following laws, he would not have been able to explain?

a) Law of dominance b) Law of independent assortment c) Law of segregation

d) Law of purity of gametes

36. XO type of sex determination and XY type of sex determination are the examples of

a) male heterogamety b) female heterogamety c) male homogamety

d) both (b) and (c).

37. Which of the following is mismatched pair of disease and its related symptom?

a)

Disease	Symptom
Phenylketonuria	Urine turns black on exposure to air

b)

Disease	Symptom
Down's syndrome	Physical and mental retardation

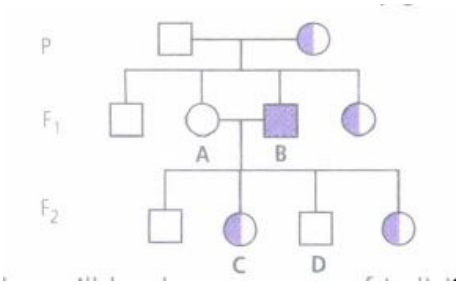
c)

Disease	Symptom
Klinefelter's syndrome	Sterile males

d)

Disease	Symptom
Turner's syndrome	Sterile females

38. Which of the following is autosomal dominant disease?
    a) Albinism b) Cystic fibrosis c) PKU d) Myotonic dystrophy
39. The allele which is unable to express its effect in the presence of another is called _____
    a) codominant b) supplementary c) complementary d) recessive
40. A gene locus has two alleles A, a. If the frequency of dominant allele A is 0.4, then what will be the frequency of homozygous dominant, heterozygous and homozygous recessive individuals in the population?
    a) 0.16(AA); 0.24(Aa); 0.36(aa) b) 0.16(AA); 0.48(Aa); 0.36(aa)
    c) 0.16(AA); 0.36(Aa); 0.48(aa) d) 0.36(AA); 0.48(Aa); 0.16(aa)
41. Haploids are able to express both recessive and dominant alleles/mutations because there are___
    a) many alleles for each gene b) two alleles for each gene
    c) only one allele for each gene in the individual d) only one allele in a gene
42. First geneticist/father of genetics was_____ .
    a) Devries b) Mendel c) Darwin d) Morgan
43. Study the given pedigree chart showing the inheritance of an X-linked trait controlled by gene 'r'.



    What will be the genotypes of individuals A, B, C and D respectively?
    a) XX, X^rY, X^rX, XY b) X^rX^r, XY, XX, XY c) X^rX, X^rY^r, X^rX^r, X^rY d) XX, X^rY^r, XX, XY
44. Crossing over in diploid organism is responsible for_____
    a) dominance of genes b) linkage between genes c) segregation of alleles
    d) recombination of linked alleles
45. 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) 100% b) 6% c) >50% d) <50%
46. Both sickle cell anemia and Huntington's chorea are _____ .
    a) congenital disorders b) pollulant-induced disorders c) virus-related diseases
    d) bacteria - related diseases

47. Which of the following are reasons for Mendel's success?
    (i) Usage of pure lines or pure breeding varieties
    (ii) Consideration of one character at a time
    (iii) Maintenance of statistical records of experiments
    (iv) Knowledge of linkage and incomplete dominance
    a) (i) and (ii) only b) (i), (ii) and (iii) c) (i) and (iv) only d) (ii), (iii) and (iv)

48. Mendel studied inheritance of seven pairs of traits in pea which can have 21 possible combinations. If you are told that in one of these combinations, independent assortment is not observed in later studies, your reaction will be_____
    a) independent assortment principle may be wrong
    b) Mendel might not have studied all the combinations c) it is impossible
    d) later studies may be wrong

49. Which one of the following postulates was converted by correns into first law of Mendel?
    a) Postulate 1 b) Postulate 2 c) Postulate 3 d) Postulate 4

50. Mother and father of a person with 'O' blood group have 'A' and 'B' blood group respectively. What would be the genotype of both mother and father?
    a) Mother is homozygous for 'A' blood group and father is heterozygous for 'B'.
    b) Mother is heterozygous for 'A' blood group and father is homozygous for 'B'.
    c) Both mother and father are heterozygous for 'A' and 'B' blood group, respectively.
    d) Both mother and father are homozygous for 'A' and 'B' blood group, respectively.

51. When mulatto male individual marries with very light(albino) female, the percentage of very light offsprings will be
    a) 25% b) 60% c) 12.5% d) 50%

52. An individual exhibiting both male and female sexual characteristics in the body is known as _____ .
    a) hermaphrodite b) intersex c) gynandromorph d) bisexual

53. If Mendel had studied the seven traits using a plant with 12 chromosomes instead of 14, in what way would his interpretation have been different?
    a) He would have mapped the chromosome
    b) He would have discovered blending or incomplete dominance
    c) He would not have discovered the law of independent assortment
    d) He would have discovered sex-linkage

54. Match column I with column II and select the correct option from the given codes

Column I	**Column II**
A. Turner's syndrome	(i) Trisomy
B. Linkage	(ii)AA+XO
C. Y-chromosome	(iii)Morgan
D. Down's syndrome	(iv)TDF

    a) A-(ii), B-(i), C-(iv), D-(iii) b) A-(iv), B-(i), C-(ii), D-(iii) c) A-(iv), B-(ii), C-(i), D-(iii)
    d) A-(ii), B-(iii), C-(iv), D-(i)

55. Failure of cytokinesis after telophase stage of cell division results in an increase in a whole set of chromosomes in an organism. The phenomenon is called as:
    a) polyploidy b) aneuploidy c) haploidy d) diploidy

56. Point mutation may occur due to
    a) alteration in DNA sequence b) change in a single base pair of DNA
    c) deletion of a segment of DNA d) gain of a segment in DNA.

57. Which one of the following blood groups is not possible in children from parents with combination B x AB?
    a) A b) B c) AB d) O

58. Blue eye colour is recessive to brown eye colour. A brown eyed man whose mother was blue eyed marries a blue eyed women. The children shall be_____ .
    a) both blue eyed and brown eyed 1: 1 b) all brown eyed c) all blue eyed
    d) blue eyed and brown eyed 3: 1

59. Which condition describes the sex correctly?
    a) XO condition as in Turner's syndrome determines the female sex
    b) XX sex chromosomes produce male in Drosophila
    c) ZZ sex chromosomes determine female sex in birds
    d) XO sex chromosomes determine male sex in Grasshopper

60. True-breeding red-eyed **Drosophila** flies with plain thoraxes were crossed with pink-eyed flies with striped thoraxes.
    Red eye plain thorax $\times$ Pink eye striped thorax
    The F_1 flies were then test crossed against the double recessive.
    The following F_2 generation resulted from the cross:

80	16	12	92
Red eye	Red eye	Pink eye	Pink eye
Plain thorax	Striped thorax	Plain thorax	Striped thorax

    What percentage number of recombinants resulted from the test cross?
    a) 12 b) 14 c) 16 d) 28

61. Sickle cell anaemia has not been climinated from the African population because____
    a) it is not a fatal disease b) it provides immunity against malaria
    c) it is controlled by dominant genes d) it is controlled by recessive genes

62. In Down's syndrome of a male child, the sex complement is_____
    a) XO b) XY c) XX d) XXY

63. Outcross represents
    a) AA x BB b) Aa x aa c) aa x AA d) Aa x AA

64. A cross between pure tall pea plant with green pods and dwarf pea plant with yellow pods will produce dwarf F_2, plants out of 16____
    a) 9 b) 3 c) 4 d) 1

65. Possible blood group in children from the parents with 'B' and 'O' blood group are

a) All B b) All O c) Both B and O d) A and B

66. Select the incorrect statement from the following _____ .
    a) Galactosemia is an inbom etror of metabolism.
    b) Small population size results 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
67. In polygenic inheritance
    a) many genes govern a single character
    b) heterozygous organisms express only one allele itself
    c) heterozygous organisms express both alleles
    d) a single gene influences many characters
68. Two crosses between the same pair of genotypes or phenotypes in which the source of the gametes are reversed in one cross, is known as_____
    a) reverse cross b) test cross c) reciprocal cross d) dihybrid cross
69. A marriage between a colourblind man and a normal woman produces
    a) all carrier daughters and normal sons
    b) 50% carrier daughters, 50% normal daughters
    c) 50% colourblind sons, 50% normal sons d) all carrier offsprings.
70. The gene disorder phenylketonuria is an example for
    a) multiple allelism b) polygenic inheritance c) multiple factor d) pleiotropy
71. Which of the following is not an example of recessive autosomal disease?
    a) Haemophilia b) Cystic fibrosis c) Phenylketonuria d) Sickle-cell anaemia
72. Which of the following is suitable for experiment on linkage?
    a) aaBB x aaBB b) AABB x aabb c) AaBb x AaBb d) AAbb x AaBB
73. A gene showing codominance has_____
    a) alleles tightly linked on the same chromosome
    b) alleles that are recessive to each other
    c) both alleles independently expressed in the heterozygote
    d) one allele dominant on the other
74. The hereditary material present in the bacterium E. coli is_____
    a) single stranded RNA b) double stranded RNA c) single stranded DNA
    d) double stranded DNA
75. A normal green male maize is crossed with albino female. The progeny is albino because _____
    a) green plastids of male must have mutated b) trait for albinism is dominant
    c) the albinos have biochemical to destroy plastids derived from green male
    d) plastids are inherited from female parent
76. The formation of multivalents at meiosis in diploid organism is due to_____
    a) monosomy b) inversion c) deletion d) reciprocal translocation

77. Of both normal parents, the chance of a male child becoming colour blind are _____ .
    a) no b) possible only when all the four grand parents had normal vision
    c) possible only when father's mother was colour blind
    d) possible only when mother's father was colour blind
78. Genotypically and phenotypically same ratio is obtained from
    a) Incomplete dominance b) Multiple alleles c) Out cross d) Reciprocal cross
79. In human beings 45 chromosomes/single X/XO abnormality causes _____ .
    a) Down's syndrome b) Klinefelter's syndrome c) Tumer's syndrome
    d) Edward's syndrome
80. **Assertion:** Turner's syndrome is caused due to absence of anyone of the X and Y sex chromosome.
    Reason: Such individuals show masculine as well as feminine development
    a)
    If both assertion and reason are true and reason is the correct explanation of assertion.
    b)
    If both assertion and reason are true but reason is not the correct explanation of assertion.
    c) If assertion is true but reason is false. d) If both assertion and reason are false
81. Which of the following characters was not chosen by Mendel?
    a) Pod shape b) Pod colour c) Location of flower d) Location of pod
82. Both husband and wife have normal vision though their fathers were colour blind. The probability of their daughter becoming colour- blind is _____ .
    a) 0% b) 25% c) 50% d) 75%
83. How many phenotypes are produced in a test cross of AaBBCC?
    a) Two b) Four c) Eight d) Tweive
84. Alleles are_____
    a) true breeding homozygotes b) differènt molecular forms of a gene
    c) heterozygotes d) different phenotype
85. Mendel's experimental plant was pisum sativum, but also worked and failed to find result on
    a) Tobacco and sweet pea b) Hieracium and Dolichos c) Hieracium and Oenothera
    d) Dolichos and Oenthera
86. In mice, black coat colour (allele B) is dominant to brown coat colour (allele b). The offspring of a cross between a black mouse (BB) and a brown mouse (bb) were allowed to interbreed. What percentage of the progeny would have black coats?
    a) 25% b) 50% c) 75% d) 100%

87. The allele for pea comb (P) in chickens is completely dominant to the allele for single comb (p) The alleles for black feather colour (B), and white feather colour (B') show codominance, so that BB' individuals possess blue feathers. If chickens heterozygous for both pairs of genes are mated, what proportion of offspring are expected to be pea combed and white feathered?
a) 9/16 b) 3/16 c) 1/16 d) 2/16

88. An individual affected by phenylketonuria lacks an enzyme that converts the amino acid_____ into _____.
a) tyrosine, phenylalanine b) phenylalanine, tyrosine
c) homogentisic acid, phenylalanine d) homogentisic acid, tyrosine

89. A woman has an X-linked condition on one of her X chromosomes. This chromosome can be inherited by_____
a) only grand children b) only sons c) only daughters d) Both (b) and (c)

90. Match column I with column II and select the correct option from the given codes.

Column I	**Column II**
A. Autosomal recessive trait	(i) Down's syndrome or mongolism
B. Sex-linked recessive trait	(ii) Phenylketonuria
C. Metabolic error linked to autosomal recessive trait	(iii) Haemophilia
D. Additional 21^{st} chromosome anaemia	(iv) Sickle cell

a) A-(ii), B-(i), C-(iv), D-(iii) b) A-(iv), B-(i), C-(ii), D-(iii) c) A-(iv), B-(iii), C-(ii), D-(i)
d) A-(iii), B-(iv), C-(i), D-(ii)

91. If both parents are carriers for thalassaemia, which is an autosomal recessive disorder, what are the chances of pregnancy resulting in an affected child?
a) 25% b) 100% c) No chance d) 50%

92. Of a normal couple, half the sons are haemophilic while half the daughters are carriers. The gene is located on____
a) X-chromosome of father b) Y-chromosome of father
c) one X-chromosome of mother d) both the X-chromosomes of mother

93. All of the following are parts of an operon except _____ .
a) an enhancer b) structural genes c) an operator d) a promoter

94. When a cross is made between a tall plant with yellow seeds (Tt Yy) and a tall plant with green seeds (Tt yy), what is true regarding the proportions of phenotypes of the offsprings in F_1 generation?
a)

Proportion of Tall and Green	**Proportion of Dwarf and Green**
$\frac{3}{8}$	$\frac{1}{8}$

b)

Proportion of Tall and Green	**Proportion of Dwarf and Green**
$\frac{2}{8}$	$\frac{1}{8}$

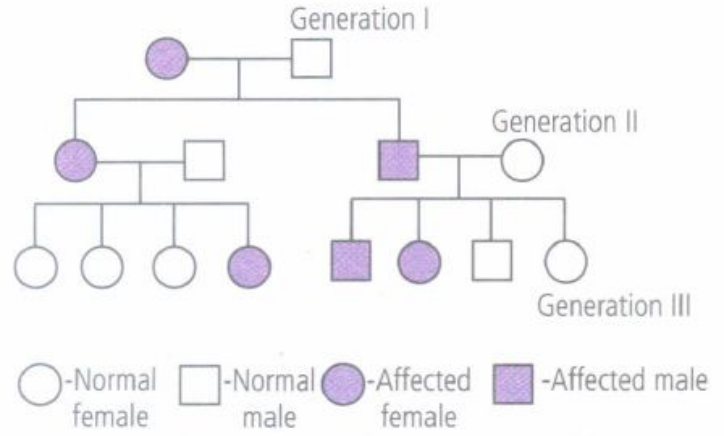
c)

Proportion of Tall and Green	Proportion of Dwarf and Green
$\frac{1}{8}$	$\frac{3}{8}$

d)

Proportion of Tall and Green	Proportion of Dwarf and Green
$\frac{2}{8}$	$\frac{2}{8}$

95. A pedigree is shown below for a disease that is autosomal dominant. What would be the genetic make up of the first generation?



a) AA, Aa b) Aa, aa c) Aa, AA d) Aa, Aa

96. The genes controlling the seven pea characters studied by Mendel are now known to be located on how many different chromosomes ?
a) Four b) Seven c) Six d) Five

97. Lack of independenr assortment of two genes A and B in fruit fly Drosophila is due to_____
a) repulsion b) recombination c) linkage d) crossing over

98. Total 512 seeeds are collected from the cross WwYy x WwYy. Find the number of plants produced with first dominant and second recessive trait.
a) 288 b) 96 c) 32 d) 320

99. To determine the genotype of a tall plant of F_2 generation, Mendel crossed this plant with a dwarf plant. This cross represents a
a) test cross b) back cross c) reciprocal cross d) dihybrid cross

100. 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) Six b) Two c) Three d) Four

101. The distance between the genes is measured by
a) Dobson unit b) millimetre c) angstrom d) map unit

102. Who observed that the behaviour of chromosomes at meiosis can serve as the cellular basis of both segregation and independent assortment?
a) Sutton and Boveri b) Banden and Boveri c) W.Flemming d) Boveri and Brauer

103. Select the correct match:
a) T.H. Morgan-Transduction b) F2 x Recessive parent-Dihybrid cross
c) Ribozyme-Nucieic acid d) G. Mendel-Transformation

104. Down's syndrome is causal by an extra copy of chromosome number 21. What percentage.of offspring produced by an affected mother and a nonnal father would be affected by this disorder?
a) 25% b) 100% c) 75% d) 50%

105. Mendel formulated the law of purity of gametes on the basis of
a) monohybrid cross b) dihybrid cross c) test cross d) back cross

106. Different mutations referrable to the same locus of chromosome give rise to _____ .
a) pseudoalleles b) polygenes c) oncogenes d) multiple alleles

107. The colour based contrasting traits in seven contrasting pairs, studied by Mendel in pea plant were
a) 1 b) 2 c) 3 d) 4

108. Heterozygous tall and red flowered pea plants were selfed and total 2000 seeds were collected. What is the total number of seeds heterozygous for both the traits?
a) 250 b) 500 c) 1250 d) 750

109. When a single gene influences more than one trait it is called
a) pseudodominance b) pleiotropy c) epistasis d) none of these

110. Pick out the correct statements
(i) Haemophilia is a sex linked recessive disease.
(ii) Down's syndrome is due to aneuploidy
(iii) Phenylketonuria is an autosomal recessive gene disorder
(iv) Sickle cell anaemia is an X-linked recessive gene disorder
a) (ii) and (iv) correct b) (i), (iii) and (iv) correct c) (i), (ii) and (iii) correct
d) (ii) and (iv) correct

111. Pleiotropic genes have
a) repressed phenotype b) hidden phenotype c) multiple phenotype d) all of these

112. Which one from those given below is the period for Mendel's hybridisation experiments?
a) 1856-1863 b) 1840-1850 c) 1857-1869 d) 1870-1877

113. A woman with albinic father marries an albinic man. The proportion of her progeny is _____ .
a) 2 normal: 1 albinic b) all normal c) all albinic d) 1 normal: 1 albinic

114. Alleles that produce independent effects in their heterozygous condition are called_____
a) codominant alleles b) epistatic alleles c) complementary alleles
d) supplementary alleles

115. Which one is a hereditary disease____
a) Cataract b) Leprosy c) Blindness d) phenyl ketonuria

116. The genotype of a plant showing the dominant phenotype un be determined by_____
a) test cross b) dihybrid cross c) pedigree analysis d) back cross

117. Rate of mutation is affected by
a) temperature b) X-rays c) gamma rays d) all of these

118. The cross over frequencies between the genes A and B, A and C and B and C is 6%, 15% and 21% respectively. What is the sequence of genes on chromosome?
a) A, B, C b) B, A, C c) A, C, B d) Either B, A, C or C, A, B

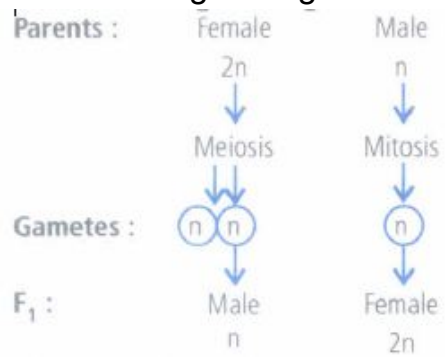
119. A colourblind man (X^cY) marries a woman who is carrier for haemophilia (XX^h). Which of the following is true for their progenies?
a) 25% female progenies carry the genes for both haemophilia and colourblindness
b) 25% male progenies carry only the gene for haemophilia.
c) 25% female progenies carry only the gene for colourblindness. d) All of these

120. A man with a certain disease marries a normal woman. They have eight children (3 daughters and 5 sons). All the daughters suffer from their father's disease but none of the sons are affected. Which of the following mode of inheritance do you suggest for this disease?
a) Sex-linked recessive b) Sex-linked dominant c) Autosomal dominant
d) Sex-limited recessive

121. Which one of the following Mendelian traits is present on 5th chromosome?
a) Pod shape b) Pod colour c) Flowers colour d) Pod position

122. The disease sickle-cell anaemia is caused by the substitution of_(i)_by _(ii)_at the _(iii)_ position of _(iv)_ globin chain of haemoglobin molecule. Which of the following correctly fills the blanks in the above statement?
a) (i) valine, (ii) glutamic acid, (iii) sixth, (iv) beta
b) (i) glutamic acid, (ii) valine, (iii) sixth, (iv) beta
c) (i) glutamic acid, (ii) valine, (iii) fifth, (iv) beta
d) (i) valine, (ii) glutamic acid, (iii) fifth, (iv) beta

123. Refer to the given figure.



This type of sex determination is found in
a) grasshoppers and cockroaches b) birds and reptiles c) butterflies and moths
d) honeybees, ants and wasps.

124. **Assertion:** Pairing and separation of pair of chromosomes would lead to segregation of a pair of factors they carried.
Reason: Two alleles of a gene pair are located on similar sites on non-homologous chromosomes.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

125. Both the allels are independently expressed in
a) Eye colour in Drosophila b) Fruit colour in Cucurbita c) Sickle cell haemoglobin
d) Height in tobacco

126. In sickle cell anaemia glutamic acid is replaced by valine Which one of the following triplets codes for valine?
a) G G G b) A A G c) G A A d) G U G

127. Select the correct statement from the ones given below with respect to dihybrid cross_____
a) Tightly linked genes un the same chromosome show higher recombinations.
b) Genes far apart on the same chromosome show very few recombinations.
c)
Genes loosely linked on the same chrosome show similar recombinations as the tightly linked ones
d) Tightly linked genes on the same chromosome show very few recombinations

128. Which one of the Mendel traits of pea was recessive
a) Axial flower b) Green pod c) Green seed colour d) Green seed colour

129. Haemophilic man marries a normal woman. Their offspring will be_____
a) all boys haemophilic b) all normal c) all girls haemophilic d) all haemophilic

130. **Assertion:** Test cross is the cross between the F_1 progeny and either of the parent types.
Reason: Back cross is the cross between F_1 progeny and the double recessive genotype.
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

131. The given Punnett's square represents the pattern of inheritance in a dihybrid cross where yellow (Y) and round (R) seed condition is dominant over white (y) and wrinkled (r) seed condition.

	YR	Yr	yR	yr
YR	F	J	N	R
Yr	G	K	O	S
yR	H	L	P	T
yr	I	M	Q	U

A plant of type 'H' will produce seeds with the genotype identical to seeds produced by the plants of

a) Type M b) Type J c) Type P d) Type N

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

a) lethal b) sub-lethal c) expressed in males d) expressed in females

133. An allele is dominant if it is expressed in_____

a) both homozygous and heterozygous states b) second generation

c) heterozygous combination d) homozygous combination

134. Which of the following is an example of pleiotropic effect?

a) Haemophilia b) Thalassemia c) Sickle cell anaemia d) Colour blindness

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

a) Deletion and insertion of base pairs cause frame-shift mutations

b) Cancer cells commonly show chromosomal abserrations

c) UV and Gamma rays are mutagens

d) change in a single base pair of DNA does not cause mutation

136. Which one is correctly matched

a) Down's syndrome - 44 autosomes + XO

b) Klinefelter's syndrome - 44 autosomes + XXY c) Erythroblastosis foetails - X linked

d) Colour blindness - Y linked

137. Refer the given statements and select the correct option.

(i) Percentage of homozygous dominant individuals obtained by selfing Aa individuals is 25%.

(ii) Types of genetically different gametes produced by genotype AABbcc are 2.

(iii) Phenotypic ratio of monohybrid F2 progeny in case of **Mirabilis jalapa** is 3: 1.

a) All the statements are true.

b) Statements (i) and (ii) are true, but statement (iii) is false.

c) Statements (i) and (iii) are true, but statement (ii) is false.

d) Statements (ii) and (iii) are true, but statement (i) is false.

138. In the F_2 generation of a Mendelian dihybrid cross the number of phenotypes and genotypes are

a) phenotypes-4; genotypes-16 b) phenotypes-9; genotypes-4

c) phenotypes-4; genotypes-8 d) phenotypes-4; genotypes-9.

139. Which condition of zygote cell will lead to birth of a normal human female child?
a) One X-chromosome b) One X and one Y chromosome c) Two X chromosome
d) One Y chromosome

140. On crossing two heterozygous tall plants (Tt) a total of 500 plants were obtained in F_1 generation. What will be the respective number of tall and dwarf plants obtained in F_1 generation?
a) 375, 125 b) 250, 250 c) 475, 25 d) 350, 150

141. Foetal sex can be determined by examining cells from the amniotic fluid by looking for ____
a) Barr bodies b) autosomes c) chiasmata d) kinetochore

142. Genes with multiple phenotypic effects are known as
a) hypostatic genes b) duplicate genes c) pleiotropic genes
d) complementary genes

143. Genes for cytoplasmic male sterility in plants are generally located in _____ .
a) cytosol b) chloroplast genome c) mitochondrial genome d) nuclear genome

144. Which of the following trait is controlled by dominant autosomal genes?
a) Polydactyly b) Huntington's chorea c) PTC(phenylthiocarbamide) tasting
d) All of these

145. A cross between two tall plants resulted in offspring having few dwarf plants. What would be the genotypes of both the parents?
a) TT and Tt b) Tt and Tt c) TT and TT d) Tt and tt

146. _____pairs of contrasting traits were studied by Mendel in pea plant
a) 6 b) 7 c) 8 d) 10

147. Mental retardation in man, associated with sex chromosomal abnormality is usually due to_____
a) reduction in X-complement b) increase in X-complement
c) moderate increase in Y-complement d) large increase in Y-complement

148. Among the following characters, which one was not considered by Mendel in his experiments of pea?
a) Stem - Tall or Dwarf b) Trichomes - Glandular or non-glandur
c) Seed - Green or Yellow d) Pod - Inflated or constricted

149. Genotype of hybrid is determined by :
a) Crossing one F, progeny with recessive parent
b) Crossing one F, progeny with another F progeny
c) Crossing one F2 progency with female parent
d) Crossing one F2 progeny with male parent

150. A family of five daughters only is expecting sixth issue. The chance of its beings a son is _____
a) Zero b) 25% c) 50% d) 100%

151. A fruit fly heterozygous for sex-linked genes, is mated with normal female fruit fly. Male specific chromosome will enter egg cell in the proportion_____ .
a) 1: 1 b) 2: 1 c) 3: 1 d) 7: 1

152. 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

153. **Assertion:** Sickle-cell anaemia is an autosome-linked recessive disorder that can be transmitted if both parents are heterozygous for the gene.
Reason: In sickle-cell anaemia, haemoglobin molecule undergoes polymerisation under low oxygen tension causing the change in shape of RBC.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

154. Phenotypic and genotypic ratio is similar in case of
a) complete dominance b) incomplete dominance c) over dominance d) epistasis

155. Sex is determined in human beings_____
a) by ovum b) at the time of fertilisation c) 40 days after fertilisation
d) seventh to eight week when genitals difterentiate in foetus

156. In Antirrhinum (dog flower), phenotypic ratio in F_2 generation for the inheritance of flower colour would be:
a) 3: 1 b) 1: 2: 1 c) 1: 1 d) 2: 1

157. A human female with Turner's syndrome____
a) has 45 chromosomes with XO b) has one additional X chromosome
c) exhibits male characters d) is able to produce children with normal husband

158. What is the probability of production of dwarf offsprings in a cross between two heterozygous tall pea plants?
a) Zero b) 50% c) 25% d) 100%

159. How many different kinds of gametes will be produced by a plant having the genotype AaBbCc?
a) 4 b) 9 c) 2 d) 8

160. Law of indepedent assortment is derived from
a) F_1 generation of trihybrid cross b) F_2 generation of dihybrid cross
c) F_2 generation of monohybrid d) One gene test cross

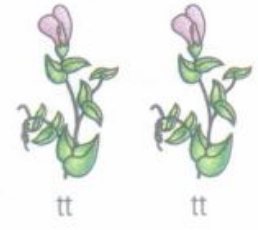
161. **Assertion:** Females, homozygous for genes on the X chromosomes do not express a trait more markedly than do hemizygous males.
Reason: Dosage compensation mechanism accounts for effective dosage genes in males and females.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

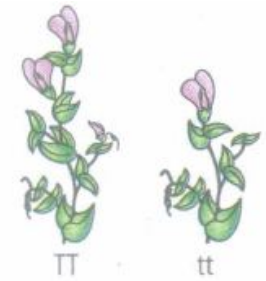
162. In humans, attached earlobes are a dominant feature over free earlobes while hypertrichosis of the ear is a holandric (Y-linked) feature. A man with attached earlobes and extensive hair on pinna married a woman having free earlobes. The couple had one son with attached earlobes and hairy pinna, another son with free earlobes and hairy pinna and two daughters with attached earlobes. One of the daughters married a man with free earlobes and sparse hair on pinna. They had two sons. What would be the characteristics of their pinnae?
a) Both will have attached earlobes and sparse hair on pinna.
b)
There would be equal chances for both having free or attached earlobes and sparse hair on pinnae.
c)
They would have hairy pinnae and there would be 1 in 8 chance that both will have attached earlobes.
d) Both will have free earlobes and extensive hair on pinnae.

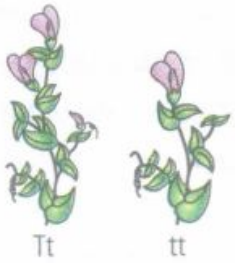
163. In order to find out the different types of gametes produced by a pea plant having the genoptype AaBb, it should be crossed to a plant with the genotype_____
a) AABB b) AaBb c) aabb d) aaBB

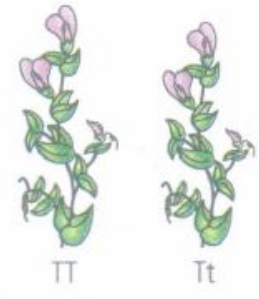
164. A women with 47 chromosomes due to three copies of chromosome 21 is characterized by_____
a) super femaleness b) hiploidy c) turner's Syndrome d) down's Syndrome

165. Which of the following crosses will give tall and dwarf pea plants in same proportions?

a) 

b) 

c) 

d) 

166. If a genetic disease is transferred from a phenotypically normal but carrier female to only some of the male progeny, the disease is:
a) autosomal dominant b) autosomal recessive c) sex-linked dominant
d) sex-linked recessive

167. A child has blood group 'O'. If father has blood group 'A' and mother has blood group 'B', work out the genotypes of the parents.
a) I^AI^A and I^Bi b) I^Ai and I^Bi c) I^Ai and ii d) ii and I^BI^B

168. In TtggRr x TtGgRr, the percentage of recessive individuals will be
a) 12 b) 6 c) 25 d) 3

169. Due to nondisjunction of chromosomes during spermatogenesis, some sperms carry both sex chromosomes (22A + XY) and some sperms do not carry any sex chromosome (22A + 0). If these sperms fertilise normal eggs (22A + X), what types of genetic disorders respectively appear among the offsprings?
a) Klinefelter's syndrome and Turner's syndrome
b) Turner's syndrome and Klinefelter's syndrome
c) Down's syndrome and Turner's syndrome
d) Down's syndrome and cri-du-chat syndrome

170. Which is the most common mechanism of genetic variation in the population of sexually reproducing organism?
a) Chromosomal aberrations b) Genetic drift c) Recombination d) Transduction

171. If character is controlled by six alleles of a gene, then the possible genotypes would be
a) 21 b) 729 c) 64 d) 42

172. Types of gametes formed by the plant with genotype AABbccDD will be
a) 4 b) 16 c) 8 d) 2

173. Ratio of complementary genes _____ .
a) 9: 3: 4 b) 12: 3: 1 c) 9: 3: 3: 4 d) 9: 7

174. A person with 47 chromosomes due to an additional Y chromosome suffers from a condition called_____ .
a) Down's syndrome b) Super female c) Turner's syndrome
d) Klinefelter's syndrome

175. A pleiotropic gene_____
a) is a gene evolved during Pliocene
b) controls a trait only in combination with another gene
c) controls multiple traits in an individual d) is expressed only in primitive plants

176. Red green colourblindness is a sex linked trait. Which of the given statements is not correct regarding colourblindness?
a) It is more common in males than in females.
b)
Homozygous recessive condition is required for the expression of colourblindness in females.
c) Males can be carriers of the trait.
d)
Colourblind women always have colourblind father and always produce colourblind son.

177. In Mendelian dihybrid cross, when heterozygous Round Yellow are self crossed, Round Green offsprings are represented by the genotype
a) RrYy, RrYY, RRYy b) Rryy, RRyy, rryy c) rrYy, rrYY d) Rryy, RRyy.

178. In a certain 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 rrtt genotlpe, what will be the percentage of tall plants with red fiuits in the progeny?
a) 50% b) 100% c) 75% d) 25%

179. After crossing two plants, the progenies are found to be male sterile. This phenomenon is found to be maternally inherited and is due to some genes which are present in_____
a) nucleus b) chloroplast c) mitochondria d) cytoplasm

180. How many phenotypes are possible if a character is controlled by 5 pairs of polygenes?
a) 32 b) 11 c) 243 d) 81

181. Genes located on Y-chromosome are_____ .
a) mutant genes b) sex-linked genes c) autosomal genes d) holandric genes

182. In monohybrid cross, number of pure line plants in F_2 will be
a) One b) Two c) Three d) Four

183. The characters which appear in the first filial generation are called
a) recessive characters b) dominant characters c) holandric characters
d) lethal characters

184. Two dominant non-allelic genes are 50 map units apart.The linkage is_____ .
a) cis type b) trans type c) complete d) absent/incomplete

185. Two linked genes a and b show 20% recombination. The individuals of a dihybrid cross between + +/+ + x ab/ab shall show gametes _____ .
a) ++80: ab:20 b) ++ 50: ab: 50 c) ++40: ab 40: +a 10: +b: 10
d) ++30: ab 30: + a20: + b: 20

186. In a certain plant, yellow fruit colour (Y) is dominant to green fruit colour (y) and round shape (R) is dominant to oval shape (r). The two genes involved are located on different chromosomes.
Which of the following will result when plant YyRr is self-pollinated?
a) 9: 3: 3: 1 ratio of phenotypes only b) 9: 3: 3: 1 ratio of genotypes only
c) 1: 1: 1: 1 ratio of phenotypes only d) 1: 1: 1: 1 ratio of phenotypes and genotypes

187. The maximum height of a plant is 18 feet and minimum average height 6 feet. If plant height is controlled by 3 pairs of polygenes, then the height of a plant with genotype AabbCc will be
a) 8 feet b) 10 feet c) 12 feet d) 14 feet

188. HJ Muller was awarded Nobel Prize for his____
a) discovery that chemicals can induce gene mutations
b) discovery that ionizing radiations can induce gene mutations
c) work on gene mapping in Drosophila
d) efforts to prevent the use of nuclear weapons

189. In maize, coloured endosperm (C) is dominant over colourless (c); and full endosperm (R) is dominant over shrunken (r). When a dihybrid of F_1 generation was test crossed, it produced four phenotypes in the following percentage:
Coloured full - 48%
Coloured shrunken - 5%
Colourless full - 7%
Colourless shrunken - 40%
From this data, what will be the distance between two non-allelic genes?
a) 48 units b) 5 units c) 7 units d) 12 units

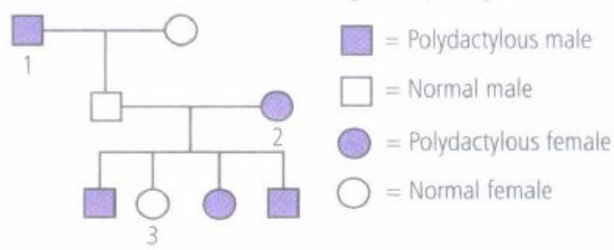
190. The modified allele is generally the
a) Recessive allele b) Dominant allele c) Wild allele
d) More than one option is correct

191. Cri-du-chat syndrome in humans is caused by the _____ .
a) loss of half of the short arm of chromosome
b) loss of half of the long arm of chromosome c) trisomy of 21 st chromosome.
d) fertilisation of an XX egg by a normal Y-bearing sperm.

192. The contrasting pairs of factors in Mendelian crosses are called____
a) multiple alleles b) allelomorphs c) alloloci d) paramorphs

193. In humans, polydactyly (i.e, presence of extra fingers and toes) is determined by a dominant autosomal allele (P) and the normal condition is determined by a recessiveallele (p). Find out the possible genotypes of family members 1, 2 and 3 in the

given pedigree.



a)

1	2	3
PP	Pp	PP

b)

1	2	3
PP	PP	pp

c)

1	2	3
Pp	PP	Pp

d)

1	2	3
Pp	Pp	pp

194. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Autopolyploidy	(i) 2n + 1
B. Trisomy	(ii) AAAA
C. Allopolyploidy	(iii) AABB
D. Nullisomy	(iv) 2n - 2

a) A-(ii), B-(i), C-(iii), D-(iv) b) A-(iv), B-(i), C-(ii), D-(iii) c) A-(ii), B-(iv), C-(iii), D-(i)

d) A-(ii), B-(i), C-(iv), D-(iii)

195. How many true breeding pea plant varieties did mendel select as pairs, which were similar except in one character with contrasting traits?

a) 14 b) 8 c) 4 d) 2

196. Read the given statements and select the correct option.

Statement 1: Test cross is used to determine an unknown genotype within one breeding generation.

Statement 2: Test cross is a cross between F_1 hybrid and dominant parent.

a) Both statements 1 and 2 are correct.

b) Statement 1 is correct but statement 2 is incorrect

c) Statement 1 is incorrect but statement 2 is correct.

d) Both statements 1 and 2 are incorrect.

197. If a haemophilic man marries a carrier woman then which of the following holds true for their progenies?

a) 50% daughters are carrier and 50% are haemophilic.

b) All the daughters are haemophilic.

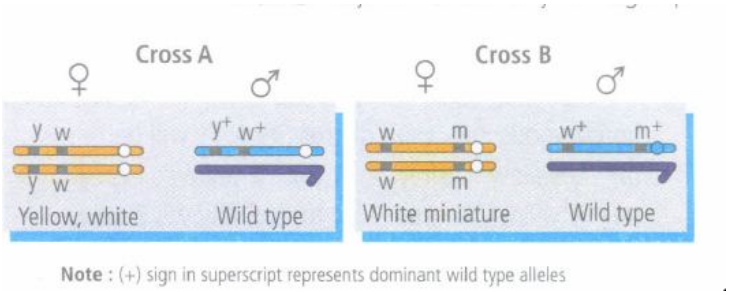
c) All sons are haemophilic and all daughters are normal.

d) All sons normal, all daughters carriers.

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

a) pseudoalleles b) different genes c) multiple alleles d) parts of same gene

199. Refer to the given figure of cross A and cross B and select the correct statement regarding them.



a)
In cross A, the strength of linkage between genes y and w is higher than the cross B genes wand m.
b)
In cross A, the strength of linkage between genes y and w is lesser than the cross B genes wand m.
c) Both cross A genes y and wand cross B have the same strength of linkage.
d) The percentage of recombinants produced in cross A is higher than cross B.

200. In a cross between negro and albino skin colour of humans showing polygenic inheritance, the phenotypic ratio in F_2 generation will be
a) 9:3:3:1 b) 1:6: 15:20: 15:6: 1 c) 1:4:6:4:1 d) 1:2:2:4: 1:2: 1:2:1

201. Match column I with column II and select the correct option from the given codes

Column I	**Column II**
A. Chromosomal aberration	(i) An additional sex chromosome
B. Down's syndrome	(ii) Inversion
C. Klinefelter's syndrome	(iii) Presence of an extra chromosome
D. Turner's syndrome	(iv) Absence of sex chromosome

a) A-(ii), B-(iv), C-(i), D-(iii) b) A-(ii), B-(iv), C-(iii), D-(i) c) A-(ii), B-(iii), C-(i), D-(iv)
d) A-(iii), B-(iv), C-(i), D-(ii)

202. Out of 8 ascospores formed in Neurospora the arrangement is 2a: 4a: 2a showing _____ .
a) no crossing over b) some meiosis c) second generation division
d) first generation division

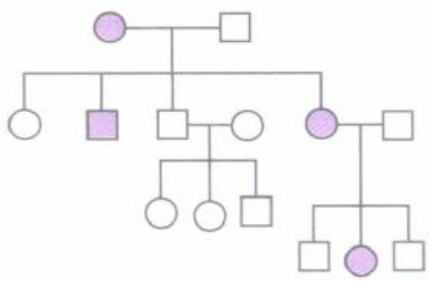
203. Which one of the following crosses would have 1:1:1:1 ratio?
a) TtRR x ttrr b) TTRR x ttrr c) TtRr x ttrr d) TtRR x TTrr

204. A man whose father was colour blind marries a woman who had a colour blind mother and normal father. What percentage of male children of this couple will be colour blind?
a) 25 % b) 0% c) 50% d) 75%

205. Which Mendelian idea is depicted by a cross in which the F_1 generation resembles both the parents?
a) Law of dominance b) Inheritance of one gene c) Co-dominance
d) Incomplete dominance

206. A colour blind man marries a women with normal sight who has no history of colour blindness in her family. What is the probability of their grandson being colour blind?
a) 0.25 b) 0.5 c) 1 d) Nil

207. Study the pedigree chart of a family showing the inheritance of myotonic dystrophy.



The trait under study is
a) dominant X-linked b) recessive X-linked c) autosomal dominant
d) recessive Y-linked

208. **Assertion:** Turner's syndrome is caused due to absence of anyone of the X and Y sex chromosome.
Reason: Such individuals show masculine as well as feminine development
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

209. The genotypes of a husband and Wife are I^AI^B and I^AI^0 .
Among the blood types of their children, how many different genotypes and phenotypes are possible?
a) 3 genotypes; 4 phenotypes b) 4 genotypes; 3 phenotypes
c) 4 genotypes; 4 phenotypes d) 3 genotypes; 3 phenotypes

210. A cow with red coat is crossed with a bull having white coat. Their offspring produced in F_1 generation showed roan coat. This effect is produced due to juxtaposition of small patches of red and white colour. What can be assumed about the gene controlling coat colour in cattle?
a)
The alleles of gene controlling coat colour show a perfect dominant recessive relationship.
b) The alleles of gene controlling coat colour are incompletely dominant.
c) The alleles of gene controlling coat colour are codominant d) None of these

211. Loss of an X-chromosome in a particular cell, during its development, results into_____
a) diploid individual b) triploid individual c) gynandromorphs d) Both (a) and (b)

212. _____is an example of X-linked recessive trait.
a) Phenylketonuria b) Haemophilia c) Cystic fibrosis d) Sickle-cell anaemia

213. 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 then second child will also be an albino?
a) 100% b) 25% c) 50% d) 75%

214. Both chromosomes as well as genes do not occur in pairs in the
a) Somatic cells b) Fertilised egg c) Megaspore mother cell d) microspore

215. If map distance between genes P and Q is 4 units, between P and R is 11 units, and between Q and R is 7 units, the order of genes on the linkage map can be traced as follows.

a) 

b) 

c) 

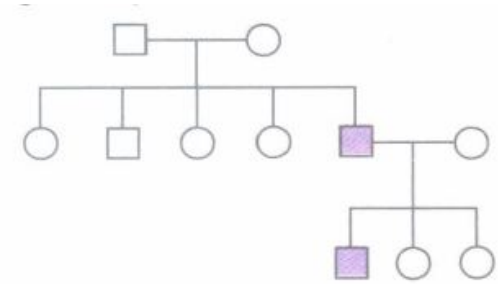
d) 

216. Phenotype of an organism is the result of_____
a) cytoplasmic effects and nutrition b) environmental changes and sexual dimorphism
c) genotype and environment interactions d) mutations and linkages

217. A plant with genotype AABBCC is selfed F2 phenotypic ratio would be :
a) 9: 3: 3: 1 b) 27: 9: 9: 9: 3: 3: 3 c) 1: 1 d) 3: 1

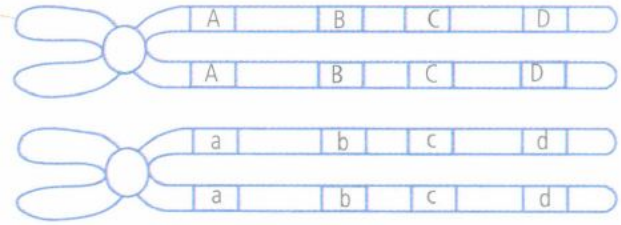
218. Down's syndrome is due to_____ .
a) crossing over b) linkage c) sex-linked inheritance
d) non-disjunction of chromosomes

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



a) dominant and sex linked b) dominant and autosomal c) recessive and sex linked
d) recessive and autosomal.

220. Given diagram shows a pair of homologous chromosomes during meiosis.



Maximum crossing over will occur between genes
a) A and a, D and d b) C and d, c and D c) B and c, b and C d) A and d, a and D.

221. 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 ratio. 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) Partial dominance c) Complete dominance
d) Codominance

222. The shorter and longer arms of a submetacentric chromosome are referred to as _____ .
a) p-arm and q-arm respectively b) q-arm and p-arm respectively
c) m-arm and n-arm respectively d) s-arm and l-arm respectively

223. Which of the following is the main category of mutation?
a) Somatic mutation b) Genetic mutation c) Zygotic mutation d) All of these

224. Inheritance of roan coat in cattle is an example of
a) incomplete dominance b) codominance c) multiple allelism d) none of these

225. The polytene chromosomes were discovered for the first time in_____
a) Drosophila b) Chironomus c) Musca nebulo d) Musca domestica

226. In this disease, there occurs a failure of chloride ion transport mechanism in cell surface membrane of epithelial cells; sweat of the patient contains very high level of Na^+ and Cl^- ions. The disease is
a) thalassaemia b) Alzheimer's disease c) Gaucher's disease d) cystic fibrosis.

227. Match column I with column II and select the correct option from the given codes.

Column I	**Column II**
A. Gregor J. Mendel	(i)Chromosomal theory of inheritance
B. Sutton and Boveri	(ii)Laws of inheritance
C. Henking	(iii)Drosophila
D. Morgan	(iv)Discovered X-body

a) A-(ii), B-(i), C-(iv), D-(iii) b) A-(iv), B-(i), C-(ii), D-(iii) c) A-(iv), B-(ii), C-(i), D-(iii)
d) A-(ii), B-(iii), C-(iv), D-(i)

228. Occasionally, a single gene may express more than one effect. The phenomenon is called
a) pleiotropy b) polygeny. c) multiple allelism d) mosaicism

229. The fruit colour is squash is an example of:
a) Recessive epistasis b) Dominant epistasis c) Complementary epistasis
d) Inhibitory genes

230. Mr. Kapoor has Bb autosomal gene pair and d allele sex linked. What shall be proportion of Bd in sperms?
a) 0 b) 1/2 c) 1/4 d) 1/8

231. Conditions of a karyotype 2n ± 1 and 2n ± 2 are called
a) aneuploidy b) polyploidy c) allopolyploidy d) monosomy

232. G-6-P dehydrogenase deficiency is associated with haemolysis of _____ .
a) leucocytes b) lymphocytes c) platelets d) RBCs

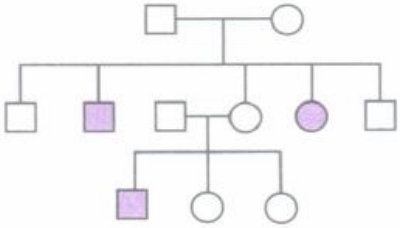
233. A colourblind girl is rare because she will be born only when____
a) her mother and matemal grandfather were colourblind
b) her father and maternal grandfather were colourblind
c) her mother is colour blind and father has normal vision
d) parents have normal vision but grand parents were colourblind

234. Insertion or deletion of a single base causes
a) inversion mutation b) transition mutation c) frame-shift mutation
d) transversion mutation

235. A normal women, whose father had haemophilia, married a normal man. What is the chance of occurrence of haemophilia in their children?
a) 25% b) 50% c) 75% d) Non haemophilic, 75% carrier

236. How many types of gametes can be produced by a diploid organism who is heterozygous for 4 loci?
a) 4 b) 8 c) 16 d) 32

237. Study the pedigree chart of a family showing the inheritance of sickle-cell anaemia.



The trait traced in the above pedigree chart is
a) dominant X-linked b) recessive X-linked c) autosomal dominant
d) autosomal recessive

238. A diseased man marries a nonnal wonun. They have three daughters and five sons. All the daughters were diseased and sons were nomal. The gene of this disease is_____
a) sex-linked dominant b) sex-linked recessive c) sex-linked character
d) autosomal dominant

239. A normal women, whose: father was colour-blind is married to a normal man. The sons would be_____ .
a) 75% colour-blind b) 50% color-blind c) all normal d) all colour-blind

240. Haemophilia is more commonly seen in human males than, in human females because___
a) a greaterproportion ofgirls die in infancy
b) this disease is due to a Y-linked recessive mutation
c) this disease is due to an X-linhed recessive mutation
d) this disease is due to an X-linked dominant mutation

241. Andalusian fowls have two pure forms - black and white. If black forms (BB) and white forms (WW) are crossed, F_1 individuals appear blue coloured (BW), due to Incomplete dominance. Which of the following would be an outcome of a cross between black form and blue form?
a) 1 Black: 2 Blue: 1 White b) 2 Black: 1 Blue c) 1 Black: 2 Blue d) 1 Black: 1 Blue

242. Haemophilia is more common in males because it is a_____
a) recessive character carried by Y - chromosome
b) dominant character carried by Y -chromosome
c) dominant trait carried by X-chromosome
d) recessive trait carried by X-chromosome

243. Nicotiana sylvestris flowers only during long days and N. tabacum flowers only during short days. If raised in the laboratory under different photoperiods, they can be induced to flower at the same time and can be cross fertilised to produce self-fertile offspring. What is the best reason for considering N. sylvestris arrd, N. tabacum tobe separate species?
a) They are-morphologically-distinct b) They cannot interbreed in nature
c) They are reproductively distinct d) They are physiologically distinct

244. Select the disease which is caused by recessive autosomal genes when present in homozygous condition.
a) Alkaptonuria b) Albinism c) Cystic fibrosis d) All of these

245. When a certain character is inherited only through female,parents it probably represents_____
a) multiple plastid inheritance b) cytoplasmic inheritance c) incomplete dominance
d) Mendelian nuclear inheritance

246. An organism with two identical alleles is___
a) dominant b) hybrid c) heterozygous d) homozygous

247. Assume that genes a and b linked and show 40% recombination. If ++/+= individual is crossed with ab/ab, then types and proportions of gametes in F_1 will be
a) ++ 20% : ab 20% :+b 20%: a+40% b) ++ 50% : ab 50%
c) ++25% : ab 25% : +b 25% : a 25% d) ++ 30% : ab 30% :+b 20% : a+20%

248. Out of A = T G^{o}C pairing, bases of DNA may exist in alternate valency state owing to arrangement called_____
a) analogue substitution b) tautomerisational mutation c) frameshift mutation
d) point mutation

249. Complete the given table showing different possibilities of genotypes and their corresponding blood group, by selecting the correct option.

Genotypes	**Blood groups**
I^AI^A__(i)__	A
I^BI^B__(ii)__	B
__(iii)__	AB
__(iv)__	O

a)

i	ii	iii	iv
I^AI^A	I^BI^B	I^AI^B	ii

b)

i	ii	iii	iv
I^AI^A	I^BI^B	I^AI^B	I^Ai

c)

i	ii	iii	iv
I^Ai	I^Bi	I^AI^B	ii

d)

i	ii	iii	iv
I^Ai	I^Bi	I^AI^B	I^Bi

250. Select the incorrect match _____ .
a) Submetacentric-L - shaped chromosomes chromosomes
b) Allosomes - Sex chromosomes c) Lamplorush - Diplotene bivalents chromosomes
d) Polytene - Oocytes of chromosomes amphibians

251. In XO type of sex determination
a) females produce two different types of gametes
b) males produce two different types of gametes
c) females produce gametes with Y chromosome
d) males produce gametes with Y chromosome

252. Segregation of Mendelian factors (no linkage, no crossing over) occurs during____
a) anaphase-I b) anaphase-II c) diplotene d) metaphase-I

253. **Assertion:** Phenylpyruvic acid is excreted through urine in case of phenylketonuria.
Reason: The affected individual lacks enzyme phenylalanine hydroxylase
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

254. Which one of the following conditions in humans, is correctly matched with its chromosomal abnormality/linkage?
a) Klinefelters syndrome - 44 autosomes + XXY b) Colour blindness - Y - linked
c) Erythroblastosis foetalis - X - linked d) Downs syndrome -44 autosomes +XO

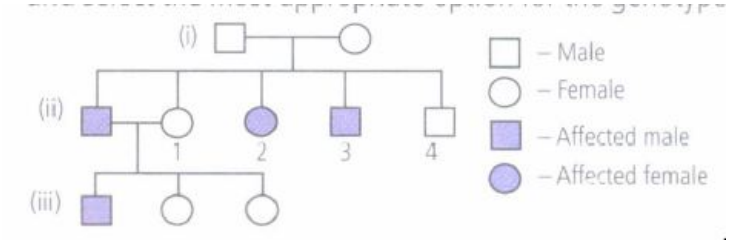
255. Which contribute to the success of Mendel?
a) Qualitative analysis of data b) Observation of distinct inherited traits
c) His knowledge of Biology d) Consideration of one character at one time

256. A mutation at one base of the first codon of a gene produces a non-functional protein. Such a mutation is referred as _____ .
a) frameshift mutation b) mis-sense mutation c) non-sense mutation
d) reverse mutation

257. RR (red) Antirrhinum is crossed with WW (white) one. Offspring RW are pink. This is an example of_____
a) dominant-recessive b) incomplete dominance c) hybrid d) supplementary genes

258. How many pairs of contrasting characters in pea plants were studied by Mendel in his experiments?
a) Six b) Eight c) Seven d) Five

259. Study the given pedigree chart for sickle-cell anaemia and select the most appropriate option for the genotypes.



a)

Genotypes of parents	Genotypes of 1st and 3rd child in F_1
$Hb^A\ Hb^S$, $Hb^A\ Hb^A$	$Hb^A\ Hb^A$, $Hb^A\ Hb^S$

b)

Genotypes of parents	Genotypes of 1st and 3rd child in F_1
$Hb^A\ Hb^S$, $Hb^A\ Hb^s$	$Hb^A\ Hb^A$, $Hb^A\ Hb^A$

c)

Genotypes of parents	Genotypes of 1st and 3rd child in F_1
$Hb^A\ Hb^A$, $Hb^A\ Hb^S$	$Hb^A\ Hb^A$, $Hb^S\ Hb^S$

d)

Genotypes of parents	Genotypes of 1st and 3rd child in F_1
$Hb^A\ Hb^S$, $Hb^A\ Hb^S$	$Hb^A\ Hb^S$, $Hb^S\ Hb^S$

260. It is said that Mendel proposed that the factor controlling any character is discrete and independent. His proposition was based on the

a) results of F_3 generation of a cross

b)
observations that the offspring of a cross made between the plants having two contrasting characters shows only one character without any blending

c) self pollination of F_1 offsprings

d) cross pollination of F_1 generation with recessive parent

261. Among the seven pairs of contrasting traits in pea plant as studied by Mendel, the number of traits related to flower, pod and seed respectively were

a) 2,2,2 b) 2,2,1 c) 1,2,2 d) 1,1,2

262. Sickle cell anaemia is_____

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

b) caused by a change in a single base pair of DNA

c) characterised by elongated sickle like RBCs with a nucleus.

d) an autosomal linked dominant trait

263. Fruit shape in shephered's purse (Capsella bursa) is of two types-triangular and top-shaped. Triangular fruit shape (T) is dominant over top-shape (t). Following table summarises the results of several crosses.

Cross	Result
Strain 1 × tt	All triangular
Strain 2 × tt	1 triangular: 1 top-shaped
Strain 3 × tt	All top-shaped

Cross	Result
Strain 4 × Tt	3 triangular: 1 top-shaped

Which pair of strains possess the genotype Tt?

a) Strains 2 and 3 b) Strains 2 and 4 c) Strains 1 and 3 d) Strains 1 and 4

264. 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) 0.36 b) 0.16 c) 0.24 d) 0.48

265. A colourblind woman marries a normal visioned male. In the offspring____
a) both son and daughter are colour blind b) all daughters are colour blind
c) all sons are normal d) all sons are colour blind

266. Hybridisation between Tt x tt gives rise to the progeny of ratio _____ .
a) 1: 1 b) 1: 2: 1 c) 1: 2 d) 4: 1

267. In a test cross involving Fl 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 in two different chromosomes

268. Which of the following is an example of sex linked disease?
a) AIDS b) Colour blindness c) Syphilis d) Gonorrhoea

269. F2 generation in a 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) Codominance d) Dihybrid cross

270. Test cross is crossing between:
a) Genotype with dominant trait b) Genotype with recessives trait
c) F1 hybrid with double recessive d) Two F1 hybrids

271. One of the parents of a cross has a mutation in its mitochondria. In that cross, that parent is taken as a male. During segregation of F, 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

272. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Dihybrid test cross	(i) 9: 3: 3: 1
B. Law of segregation	(ii) Dihybrid cross
C. Law of independent assortment	(iii) 1: 1: 1: 1
D. ABO blood group in man	(iv) Purity of gametes
	(v) Multiple allelism

a) A-(iii), B-(iv), C-(ii), D-(v) b) A-(i), B-(iv), C-(ii), D-(v) c) A-(iii), B-(ii), C-(iv), D-(v)
d) A-(ii), B-(v), C-(iii), D-(i)

273. 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 its effect both in homozygous and heterozygous condition
d) it never expresses its effect in any conditions

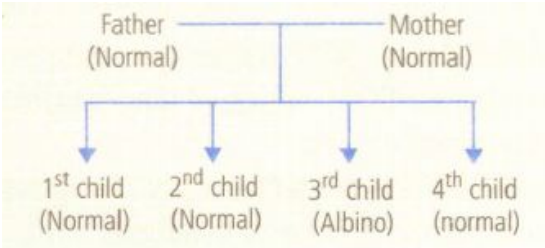
274. A disease caused by an autosomal primary nondisjunction is ____
a) Klinefelter's syndrome b) Tumer's syndrome c) Sickel Cell anemia
d) Down's syndrome

275. 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) 0.4 b) 0.5 c) 0.6 d) 0.7

276. A dihybrid test cross ratio for two completely linked genes will be
a) 1:1:1:1 b) 1:1 c) 1:7:7:1 d) 7:1:1:7

277. The recombinant phenotypic ratio in F_2 generation obtained from parental cross having genotyes TTRR x ttrr wil be
a) 9:3:3:1 b) 3:1 c) 1:2:1 d) 3:3

278. A normal-visioned man whose father was colour-blind, marries a women whose father was also colour blind. They their first child as a daughter. What are the chances that his child would be colour-blind?
a) 100% b) zero percent c) 25% d) 50%

279. 

If A = normal allele, a = albino allele, then genotypes of father and mother are respectively
a) Aa and Aa b) AA and Aa c) Aa and AA d) Aa and aa

280. Select the correct statements regarding honeybees
(i) The queen bee and the worker bees develop from fertilised eggs and are sexually females.
(ii) Males (drones) develop parthenogenetically from unfertilised eggs.
(iii) Queen bee feeds upon royal jelly and the worker bees feed upon bee bread.
a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (i), (ii) and (iii)

281. Which of the following pairs is wrongly matched?
a) XO type SexDetermination: Grasshopper
b) XO type SexDetermination: Grasshopper

c) Starch synthesis in Pea: Multiple alleles. d) T.H. Morgan: Linkage

282. **Assertion:** In pigeons, females are heterogametic and males are homogametic.
Reason: In pigeons, females have ZW sex chromosomes and males have ZZ sex chromosomes.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

283. In his classic experiments on Pea plants, Mendel did not use____
a) Pod length b) Seed shape c) Flower position d) Seed colour

284. The genetic defect-Adenosine deaminase (ADA) deficiency may be cured permanently by____
a) administering adenosine deaminase activators.
b) introducing bone marrow cells producing ADA into cells at early embryonic stages.
c) enzyme replacement therapy.
d) periodic infusion of genetically engineered lymphocytes having functional ADA cDNA.

285. In a dihybrid cross AABB x aabb, F_2 progeny of AABB, AABb, AaBB and AaBb occurs in the ratio of_____ .
a) 1: 1: 1: 1 b) 9: 3: 3: 1 c) 1: 2: 2: 1 d) 1: 2: 2: 4

286. Human blood grouping is called ABO instead of ABC because O signifies.
a) No antigen b) Over-dominance c) One antibody d) Other antigen

287. A gene pair hides the effect of another. The phenomenon is_____ .
a) epistasis b) dominance c) mutation d) None of these

288. Mendel's Law of independent assortment holds good for genes situated on the
a) non-homologous chromosomes b) homologous chromosomes
c) extra nuclear genetic element d) same chromosome

289. The frequency of recombination between gene pairs on the same chromosome as a measure of the distance between genes was explained by___
a) Gregor J. Mendel b) Alfred Sturtevant c) Sutton Boveri d) T.H. Morean

290. Haploids are more suitable for mutation studies than the diploids. This is because_____
a) haploids are reproductively more stable than diploids
b) mutagens penetrate in haploids more effectively than diploids
c) haploids are more abundant in nature than diploids
d) all mutations, whether dominant or recessive are expressed in haploids

291. Test cross involves_____
a) crossing between two F_1 hybrids
b) crossing the F_1 hybrid with a double recessive genotype

c) crossing between two genotypes with dominant trait
d) crossing between two genotypes with recessive trait

292. In a certain taxon of insects some have 17 chromosomes and the others have 18 chromosomes. The 17 and 18 chromosome-bearing organisms are
a) males and females, respectively b) females and males, respectively c) all males
d) all females.

293. Diploid chromosome number in humans is____
a) 46 b) 44 c) 48 d) 42

294. Klinefelter's syndrome is characterised by a karyotype of
a) XYY b) XO c) XXX d) XXY

295. In Antirrhinum two plants with pink flowers were hybridised. The F1 plants produced red, pink and white flowers in the proportion of 1 red, 2 pink and 1 white. What would be the genotype of the two plants used for hybridisation? Red flower colour is determined by RR and white by rr genes:
a) rr b) Rr c) RR d) Rrr

296. Failure of segregation of chromatids during cell division results in the gain or loss of chromosomes, this is called as
a) euploidy b) monoploidy c) aneuploidy d) polyploidy

297. Find out the mismatched pair
a) Haemophilia -Sex linked recessive b) Cystic fibrosis -Autosomal recessive
c) Down's syndrome -Trisomy 21 d) Turner's syndrome - Y-linked

298. **Assertion:** The law of independent assortment can be studied by means of dihybrid cross.
Reason: The law of independent assortment is applicable only to linked genes.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

299. In four o' clock plants, the gene for red flower colour (R) is incompletely dominant over the gene for white flower colour (r), hence the plants heterozygous for flower colour (Rr) have pink flowers. What will be the ratio of offsprings in a cross between red flowers and pink flowers?
a) 75% red flowers, 25% pink flowers b) All red flowers
c) 50% red flowers, 50% pink flowers d) Red: pink: white: : 1 : 2 : 1

300. Refer the given statements.
(i) Incomplete or mosaic inheritance is an example of pre-Mendelian concept of blending inheritance.

(ii) Test cross is a special type of back cross.
(iii) Chromosomal aberrations are commonly observed in cancer cells.
(iv) Thalassaemia is a Mendelian disorder.
Which of the above statements are correct?
a) (i) and (ii) only b) (ii), (iii) and (iv) c) (ii) and (iv) only d) (i) and (iv) only

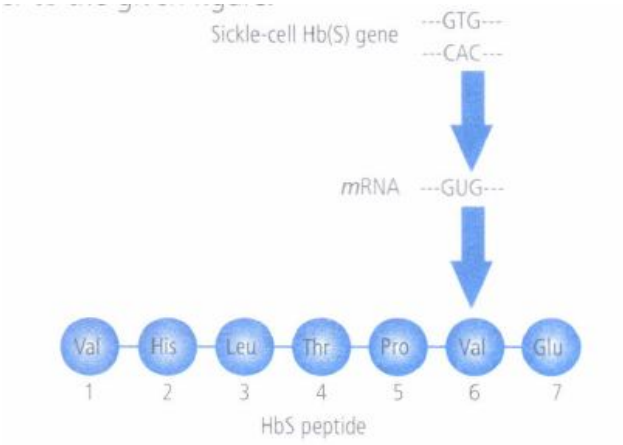
301. Chromosome maps/genetic maps were first prepared by:
a) Sutton and Boveri (1902) b) Bateson and Punnett (1906) c) Morgan (1910)
d) Sturtevant (1911).

302. Find odd one out (W,r,t.pea traits).
a) Yellow ootyledon b) Yellow pod c) Terminal flower d) Constricted pod

303. **Assertion:** The pink coloured flowers appear in F_2 generation of plant **Mirabilis jalapa**
Reason: This is observed due epistatic suppression of white colour alleles in one of parental flowers by red colour alleles.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

304. Mendel's law which is universal without any deviation is
a) Law of deminance b) Law of segregation c) Law of independent assortment
d) principle factor

305. Refer to the given figure.



The shape of RBCs under oxygen tension in the given situation becomes
a) biconcave disc like b) elongated and curved c) circular d) spherical.

306. Person having genotype $I^A I^B$ would show the blood group as AB. This is because of
a) pleiotropy b) co-dominance c) segregation d) incomplete dominance

307. The movement of a gene from one linkage group of another is called:
a) Inversion b) Duplication c) Translocation d) Crossing over

308. The most striking example of point mutation is found in a disease called___

a) thalassemia b) night blindness c) Down's syndrome d) sickle-cell anaemia

309. In fruit flies, long wing is dominant to vestigial wing. When heterozygous long-winged flies were crossed with vestigial-winged flies, 192 offsprings were produced. If an exact Mendelian ratio had been obtained, then the number of each phenotype would have been

a)

Long-winged	Vestigial-winged
64	128

b)

Long-winged	Vestigial-winged
96	96

c)

Long-winged	Vestigial-winged
128	64

d)

Long-winged	Vestigial-winged
192	0

310. **Assertion:** Mendel conducted artificial pollination Reason: When two genes in a dihybrid are on the experiments for his genetic studies using true-breeding same chromosome, the proportion of parental gene pea lines. combinations are much higher than the non-parental

Reason: A true-breeding line shows the stable trait type. inheritance and expression for several generations.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

311. "When two pairs of traits are combined in a hybrid, segregation of one pair of characters is independent of the other pair of characters". The statement explains which of the following laws/principles of Mendel?

a) Principle of paired factors b) Principle of dominance c) Law of segregation

d) Law of independent assortment

312. A recessive allele is expressed in

a) heterozygous condition only b) homozygous condition only c) F_3 generation

d) both homozygous and heterozygous conditions

313. Chromosomal theory of inheritance was given by

a) Morgan et al b) Sutton and Boveri c) Hugo de Vries d) Gregor J. Mendel

314. Select the incorrect statement_____

a) In male grasshoppers 50 % of sperms have no sex-chromosome

b) In domesticated fowls, sex of progeny. depends on the type of sperm rather than egg

c) Human males have one of their sexchromosome much shorter than the other

d) Male fruit fly is heterogametic.

315. 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) None of these

316. Number of autosomes present in liver cells of a human female is
a) 22 autosomes b) 22 pairs c) 23 autosomes d) 23 pairs

317. Point mutation involves _____ .
a) change in single base pair b) duplication c) deletion d) insertion

318. 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

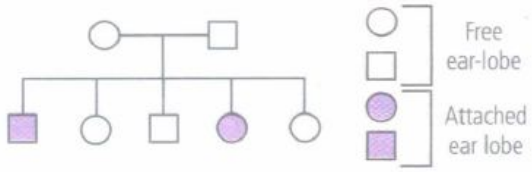
319. Identify the wrong statement with reference to the gene 'I' that controls ABO blood groups _____ .
a) When IA and IB are present together, they express same type of sugar
b) Allele 'i' does not produce any sugar c) The gene (I) has three alleles
d) A person will have only two of the three alleles

320. A woman with two genes (one on each X-chromosome) for haemophilia and one gene for colour blindness on the X-chromosomes marries a normal man. How will the progeny be?
a) All sons and daughters haemophilic and colour blind
b) Haemophilic and colour blind daughters
c) 50% haemophilic colour blind sons and 50% haemophilic sons
d) 50% haemophilic daughters and 50% colour blind daughters

321. A man having the genotype EEFfGgHH can produce P number of genetically different sperms, and a woman of genotype liLLMmNn can generate Q number of genetically different eggs. Determine the values of P and Q.
a) P = 4, Q = 4 b) P = 4, Q = 8 c) P = 8, Q = 4 d) P = 8, Q = 8

322. Mendel's work was rediscovered by three scientists in the year
a) 1865 b) 1900 c) 1910 d) 1920

323. Given pedigree chart depicts the inheritance of attached ear lobes, an autosomal recessive trait.



Which of the following conclusions drawn is correct?
a) Parents are heterozygous. b) Parents are homozygous dominant.
c) Parents are homozygous recessive. d) None of these

324. 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 quantitative defect in globin chain synthesis
b) Thalassemia is due to less synthesis of globin molecules
c) Sickel cell anemia is due to a quantitative problem of globin molecules
d) Both are due to a qualitative defect in globin chain synthesis

325. Probability of obtaining genotype AABbCc in the cross between AaBbCc x AaBbCc is:
a) $\frac{1}{16}$ b) $\frac{1}{8}$ c) $\frac{1}{32}$ d) $\frac{1}{64}$

326. Which of the following most appropriately describe haemophilia
a) Dominant gene disorder b) Recessive gene disorder
c) X-linked recessive gene disorder d) Chromosomal disorder

327. Dihybrid test cross eatio with 82% parental type and 18% recombinants type shows that genes have
a) Incomplete linkage b) Independent assortment c) Complete linkage
d) Both (1) & (2)

328. Depending upon the distance between any two genes which is inversely proportional to the strength of linkage,cross overs will vary from
a) 50-100% b) 0-50% c) 75-100% d) 100-150%.

329. The percentage of ab gamete produced by AaBb parent will be
a) 25% b) 50% c) 75% d) 12.5%.

330. What can be the blood group of offspring when both parents have AB blood group?
a) AB only b) A, B and AB c) A, B, AB and O d) A and B only

331. In mice, Y is the dominant allele for yellow fur and y is the recessive allele for grey fur. Since Y is lethal when homozygous, the result of cross Yy x Yy will be
a) 3 yellow: 1 grey b) 2 yellow: 1 grey c) 1 yellow: 1 grey d) 1 yellow: 2 grey.

332. **Assertion:** When yellow bodied, white eyed **Drosophila** females were hybridised with brown-bodied, red eyed males; and F_1 progeny was intercrossed, F_2 ratio deviated from 9:3:3:1
Reason: When two genes in a dihybrid are on the same chromosome, the proportion of parental gene combinations are much higher than the non-parental type.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

333. What is true about the crossing over between linked genes?
a) No crossing over at all b) High percentage of crossing over
c) Hardly any crossing over d) None of these

334. What will be the distribution of phenotypic features in the first filial generation after a cross between a homozygous female and a heterozygous male for a single locus?
a) 3: 1 b) 1: 2: 1 c) 1: 1 d) None of these

335. Pattern baldness, moustaches and beard in human males are examples of___

a) sex-determining traits b) sex linked traits c) sex limited traits
d) sex influenced trairs

336. Which of the following is not a hereditary disease?
a) Cystic fibrosis b) Thalassemia c) Haemophilia d) Cretinism

337. The possibility of a female becoming haemophilic is extremely rare because mother of such a female has to be at least _(i)_and father should be _(ii)_.
a) (i) haemophilic, (ii) carrier b) (i) carrier, (ii) haemophilic
c) (i) haemophilic, (ii) normal d) (i) haemophilic, (ii) haemophilic

338. ABO blood grouping in human beings cites the example of
a) incomplete dominance b) co-dominance c) multiple allelism d) both (b) and (c).

339. Read the given statements and select the correct option.
Statement 1: The law of segregation is one of the most important contributions to the biology.
Statement 2: It introduced the concept of heredity factors as discrete physical entities which do not become blended.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect.

340. Match column I with column II and select the correct option from the given codes.

Column I	**Column II**
A. Multiple allelism	(i) Tt x tt
B. Back cross	(ii) Tt x TT
C.Test cross	(iii) Human blood groups
D.Crossing over	(iv) Non-parental gene combination
E. Recombination	(v) Non-sister chromatids

a) A-(iii), B-(i), C-(ii), D-(v). E-(iv) b) A-(iii), B-(ii), C-(i), D-(v). E-(iv)
c) A-(iii), B-(ii), C-(i), D-(iv), E-(v) d) A-(iv), B-(ii), C-(i), D-(v), E-(iii)

341. A self-fertilising 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

342. 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 beon different chromosomes

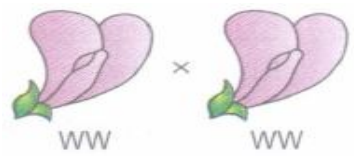
343. A test cross is carried out to:
a) Predict whether two trails are linked b) Assess the number of alleles of a gene
c) Determine the genotype of F2 plant
d) Determine whether two species or verities will breed successfully

344. Select the incorrect statement regarding pedigree analysis
a) Solid symbols show unaffected individuals
b) Proband is the person from which case history starts.
c) It is useful for genetic counsellors.
d) It is an analysis of traits in several generations of a family.

345. The grain colour of wheat is determined by the additive effect of two pairs genes. Accordingly the F_2 inheritance appears in the ratio of 15 red:1 white. The fifteen red appear in different shades in the ratio of
a) 9:3:3 b) 6:6:3 c) 1:4:7:3 d) 1:4:6:4

346. Thalassaemia is recessive autosomal disease due to:
a) Base substitution of 6th codon in the gene coding for β-chain haemoglobin
b) Reduced synthesis of α and β plyeptide of haemoglobin
c) Absence of phenylalanine hydroxylase d) defective glycoproteins

347. Which of the following is a test cross?

a) 

b) 

c) 

d) 

348. If both 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

349. A couple has six daughters. What is the possibility of their having a girl next time?
a) 10% b) 50% c) 90% d) 100%

350. Bridge between two generations which contributes equally in the heredity of the offsprings is
a) Chromosome b) Somatic cells c) Sperm and egg d) Factor

351. **Assertion:** ABO blood group system provides a good example of multiple alleles.
Reason: In ABO blood group system, when I^A and I^B alleles are present together, they both express their own types.

a)
If both assertion and reason are true and reason is the correct explanation of assertion.

b)
If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false

352. Result of a cross between a normal homozygous female and a haemophiliac male would be
a) normal males and normal females b) haemophilic males and normal females
c) normal males and carrier females d) haemophilic males and carrier females

353. ZZ/ZW type of sex determination is seen in
a) platypus b) snails c) cockroach d) peacock.

354. **Assertion:** Variety of fruit colours in **Cucurbita pepo** is result of recessive epistasis.
Reason: In recessive epistatsis, a recessive gene at one locus enhances the expression of another gene, at a different locus
a)
If both assertion and reason are true and reason is the correct explanation of assertion.

b)
If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false

355. A tobacco plant heterozygous for a recessive character is self-pollinated and 1200 seeds are subsequently germinated. How many seedlings would have the parental genotype?
a) 1250 b) 600 c) 300 d) 2250

356. How many types of genetically different gametes will be produced by a heterozygous plant having genotype AABbCc?
a) Two b) Four c) Six d) Nine

357. Study the two cases carefully. What would be the correct interpretation of the two cases?

Case	Mother	Father	Childeren
Case I	With disease	Normal	Sons always with diseases
Case II	With disease	Normal	Sons and daughters could show disease

a) Case I: X-linked recessive disease
Case II: Autosomal recessive disease
b) Case I: Y-linked recessive disease
Case II: X-linked recessive disease
c) Case I: and II: X-linked recessive disease
d) Case I: X-linked dominant disease
Case II: Autosomal dominant disease

358. 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) Co-dominance	(ii) In a heterozygous organisms 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	B	C	D
(ii)	(iii)	(iv)	(i)

b)

A	B	C	D
(iv)	(i)	(ii)	(iii)

c)

A	B	C	D
(iv)	(iii)	(i)	(ii)

d)

A	B	C	D
(ii)	(i)	(iv)	(iii)

359. A dihybrid condition is _____

a) ttRr b) Ttrr c) ttrr d) TtRr

360. Multiple alleles control inheritance of____

a) phenyl ketonuria b) colour blindness c) sickle-cell anaemia d) blood groups

361. **Assertion:** At F_2 stage in monohybrid cross, both parental traits are expressed in the proportion of 3: 1.

Reason: The contrasting parental traits show blending at F_2 stage.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false d) If both assertion and reason are false

362. An individual homozygous for genes cd is crossed with wild type ++ and F_1 crossed back with the double ressive. The appearance of the offsprings is as follows

++⟶ 903

cd⟶897

+d⟶98

c+⟶102

The distance between the genes c and d is

a) 20 map units b) 9.8 map units c) 10.2 map units d) 10 map units

363. The incorrect statement with regard to Haemophilia is _____

a) It is a recessive disease b) It is a dominant disease

c) A single protein involved in the clotting of blood is affected

d) It is a sex-linked disease

364. Which Mendelian cross can produce two genotypes and two phenotypes?

a) Monohybrid cross b) Monohybrid test cross c) Incomplete deminance

d) Codominance

365. 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) Aneuploidy b) Polyploidy c) Somaclonal variation d) Polyteny

366. In honeybees, females are _(i)_ having_(ii)_chromosomes and males are_(iii)_having_(iv)_chromosomes.

a)

i	ii	iii	iv
diploid	46	haploid	23

b)

i	ii	iii	iv
haploid	23	diploid	46

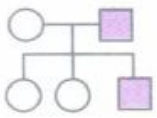
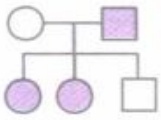
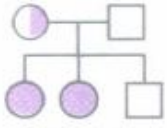
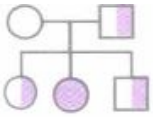
c)

i	ii	iii	iv
diploid	32	haploid	16

d)

i	ii	iii	iv
haploid	16	diploid	32

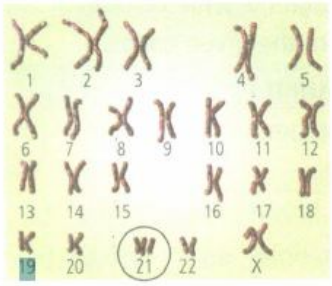
367. Wife is PTC non-taster and husband is PTC taster. Their son is taster but daughters are non-tasters. This is not a sex linked trait. Which pedigree is correct?

a)  b)  c)  d) 

368. Father of polygenic inheritance is

a) Davenport b) Kolreuter c) Galton d) Emerson and East

369. Refer to the given figure representing karyotype of individual who inflicted with this chromosomal disorder.



Select the correct statement regarding them.

a)

This disorder occurs due to failure of segregation of chromatids during cell division cycle results in the gain of chromosome.

b)

This disorder occurs due to failure of cytokinesis after telophase stage of cell division results in an increase in whole set of chromosome.

c) Individuals inflicted with this disorder are usually sterile. d) Both (a) and (c)

370. Genes located very close to one another on same chromosome tend to be transmitted together and are called as

a) allelomorphs b) identical genes c) linked genes d) recessive genes.

371. An allele is the

a) Total number of genes for a trait b) Total number of genes on chromosome

c) Alternative forms of a gene d) Alternative forms of a character

372. Genetic identity of a human male is determined by_____ .

a) autosome b) nucleolus c) sex chromosome d) cell organelles

373. What proportion of the offsprings obtained from cross AABBCC x AaBbCc will be completely heterozygous for all the genes segregated independently?
a) 1/8 b) 1/4 c) 1/2 d) 1/16

374. A man with a certain disease marries a normal woman. They have eight children (3 daughters and 5 sons). All the daughters suffer from their father's disease but none of the sons are affected. Which of the following mode of inheritance do you suggest for this disease?
a) Sex-linkedrecessive b) Sex-linked dominant c) Autosome dominant
d) Sex-limited recessive

375. Which of the following is incorrect regarding ZW-ZZ type of sex determination
a) It occurs in birds and some reptiles
b) Females are homogametic and males are heterogametic.
c) 1: 1 sex ratio is produced in the offsprings. d) All of these

376. Mendel's law of independent assortment does not hold true for the genes that are located closely on:
a) same chromosome b) non-homologous chromosomes c) X-chromosome
d) autosomes

377. Which of the following is correct for the condition when plant YyRr is back crossed with the double recessive parent?
a) 9: 3: 3: 1 ratio of phenotypes only b) 9: 3: 3: 1 ratio of genotypes only
c) 1: 1: 1: 1 ratio of phenotypes only d) 1: 1: 1: 1 ratio of phenotypes and genotypes

378. A certain road accident patient with unknown blood group needs immediate blood transfusion. His one doctor friend at once offers his blood. What was the blood group of the donor?
a) Blood group B b) Blood group AB c) Blood group O d) Blood group A

379. All genes located on the same chromosome
a) form different groups depending upon their relative distance
b) form one linkage group c) will not from any linkage groups
d) form interactive groups that affect the phenotype.

380. Which of the following characteristics represents 'Inheritance of blood groups' in humans?
1. Dominance
2. Codominance
3. Multiple allele
4. Incomplete dominance
5. Polygenic inheritance
a) 2, 4 and 5 b) 1, 2 and 3 c) 2, 3 and 5 d) 1, 3 and 5

381. The inheritance pattern of a gene over generations among humans is studied by the pedigree analysis Character studied in the pedigree analysis is equivalent to

a) quantitative trait b) Mendelian trait c) polygenic trait d) maternal trait.

382. A polygenic inheritance in human beings is _____ .
a) skin colour b) phenylketonuria c) colour blindness d) sickle-cell anaemia

383. In a monohybrid cross between two heterozygous individuals, the percentage of pure homozygous individuals obtained in F_1 generation will be:
a) 25% b) 50% c) 75% d) 100%