

# Principles of Inheritance and Variation

## 5.1 Mendel's Laws of Inheritance



8. According to Mendelism, which character shows dominance?  
(a) Terminal position of flower  
(b) Green colour in seed coat  
(c) Wrinkled seeds  
(d) Green pod colour (2000)

9. First geneticist/father of genetics was  
(a) De Vries (b) Mendel  
(c) Darwin (d) Morgan. (1991)

10. 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 (1988)

## 5.2 Inheritance of One Gene

- 13.** The genotypes of a husband and wife are  $I^A I^B$  and  $I^A i$ . 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      (NEET 2017)
- 14.** A tall true breeding garden pea plant is crossed with a dwarf true breeding garden pea plant. When the  $F_1$  plants were selfed the resulting genotypes were in the ratio of  
(a) 3 : 1 :: Tall : Dwarf  
(b) 3 : 1 :: Dwarf : Tall  
(c) 1 : 2 : 1 :: Tall homozygous : Tall heterozygous : Dwarf  
(d) 1 : 2 : 1 :: Tall heterozygous : Tall homozygous : Dwarf.      (NEET-I 2016)
- 15.** A gene showing co-dominance has  
(a) alleles that are recessive to each other  
(b) both alleles independently expressed in the heterozygote  
(c) one allele dominant on the other  
(d) alleles tightly linked on the same chromosome.      (2015)
- 16.** Alleles are  
(a) different molecular forms of a gene  
(b) heterozygotes  
(c) different phenotype  
(d) true breeding homozygotes.      (2015 Cancelled)
- 17.** Multiple alleles are present  
(a) at the same locus of the chromosome  
(b) on non-sister chromatids  
(c) on different chromosomes  
(d) at different loci on the same chromosome.      (2015 Cancelled)
- 18.** A man with blood group 'A' marries a woman with blood group 'B'. What are all the possible blood groups of their offspring?  
(a) A, B, AB and O      (b) O only  
(c) A and B only      (d) A, B and AB only      (2015 Cancelled)
- 19.** 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) partial dominance  
(b) complete dominance  
(c) codominance  
(d) incomplete dominance.      (NEET 2013)
- 20.** Which idea is depicted by a cross in which the  $F_1$  generation resembles both the parents?  
(a) Inheritance of one gene  
(b) Co-dominance  
(c) Incomplete dominance  
(d) Complete dominance      (NEET 2013)
- 21.**  $F_2$  generation in a Mendelian cross showed that both genotypic and phenotypic ratios are same as 1 : 2 : 1. It represents a case of  
(a) co-dominance  
(b) dihybrid cross  
(c) monohybrid cross with complete dominance  
(d) monohybrid cross with incomplete dominance.      (2012)
- 22.** A test cross is carried out to  
(a) determine the genotype of a plant at  $F_2$   
(b) predict whether two traits are linked  
(c) assess the number of alleles of a gene  
(d) determine whether two species or varieties will breed successfully.      (Mains 2012)
- 23.** Test cross in plants or in *Drosophila* involves crossing  
(a) between two genotypes with recessive trait  
(b) between two  $F_1$  hybrids  
(c) the  $F_1$  hybrid with a double recessive genotype  
(d) between two genotypes with dominant trait.      (Mains 2011)
- 24.** ABO blood groups in humans are controlled by the gene  $I$ . It has three alleles -  $I^A$ ,  $I^B$  and  $i$ . Since there are three different alleles, six different genotypes are possible. How many phenotypes can occur?  
(a) Three      (b) One  
(c) Four      (d) Two      (2010)
- 25.** The genotype of a plant showing the dominant phenotype can be determined by  
(a) test cross      (b) dihybrid cross  
(c) pedigree analysis      (d) back cross.      (2010)
- 26.** Which one of the following cannot be explained on the basis of Mendel's law of dominance?  
(a) The discrete unit controlling a particular character is called a factor.  
(b) Out of one pair of factors one is dominant, and the other recessive.  
(c) Alleles do not show any blending and both the characters recover as such in  $F_2$  generation.  
(d) Factors occur in pairs.      (2010)
- 27.** ABO blood grouping is controlled by gene  $I$  which has three alleles and show co-dominance. There are six genotypes. How many phenotypes in all are possible?  
(a) Six      (b) Three  
(c) Four      (d) Five      (Mains 2010)

- 28.** A cross in which an organism showing a dominant phenotype is crossed with the recessive parent in order to know its genotype is called  
 (a) monohybrid cross    (b) back cross  
 (c) test cross                (d) dihybrid cross.  
 (Mains 2010)
- 29.** In *Antirrhinum* two plants with pink flowers were hybridized. The  $F_1$  plants produced red, pink and white flowers in the proportion of 1 red, 2 pink and 1 white. What could be the genotype of the two plants used for hybridisation? Red flower colour is determined by RR and white by rr genes.  
 (a) rrrr                      (b) RR  
 (c) Rr                        (d) rr                  (Mains 2010)
- 30.** In pea plants, yellow seeds are dominant to green. If a heterozygous yellow seeded plant is crossed with a green seeded plant, what ratio of yellow and green seeded plants would you expect in  $F_1$  generation?  
 (a) 9 : 1                    (b) 1 : 3  
 (c) 3 : 1                    (d) 50 : 50              (2007)
- 31.** A common test to find the genotype of a hybrid is by  
 (a) crossing of one  $F_2$  progeny with female parent  
 (b) studying the sexual behaviour of  $F_1$  progenies  
 (c) crossing of one  $F_1$  progeny with male parent  
 (d) crossing of one  $F_2$  progeny with male parent.  
 (2007)
- 32.** Test cross involves  
 (a) crossing between two genotypes with dominant trait  
 (b) crossing between two genotypes with recessive trait  
 (c) crossing between two  $F_1$  hybrids  
 (d) crossing the  $F_1$  hybrid with a double recessive genotype.              (2006)
- 33.** Phenotype of an organism is the result of  
 (a) genotype and environment interactions  
 (b) mutations and linkages  
 (c) cytoplasmic effects and nutrition  
 (d) environmental changes and sexual dimorphism.  
 (2006)
- 34.** 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 condition.  
 (2002)
- 35.** When dominant and recessive alleles express itself together it is called  
 (a) co-dominance            (b) dominance  
 (c) amphidominance        (d) pseudodominance.              (2001)
- 36.** In hybridisation,  $Tt \times tt$  gives rise to the progeny of ratio  
 (a) 2 : 1                    (b) 1 : 2 : 1  
 (c) 1 : 1                    (d) 1 : 2.                  (1999)
- 37.** A child's blood group is 'O'. The parent's blood groups cannot be  
 (a) A and B                (b) A and A  
 (c) AB and O              (d) B and O.                (1994)
- 38.** A child of O-group has B-group father. The genotype of father will be  
 (a)  $I^O I^O$                 (b)  $I^B I^B$   
 (c)  $I^A I^B$                 (d)  $I^B I^O$ .                (1992)
- 39.** An allele is dominant if it is expressed in  
 (a) both homozygous and heterozygous states  
 (b) second generation  
 (c) heterozygous combination  
 (d) homozygous combination.              (1992)
- 40.** An organism with two identical alleles is  
 (a) dominant                (b) hybrid  
 (c) heterozygous            (d) homozygous.            (1992)
- 41.** A man of A-blood group marries a woman of AB blood group. Which type of progeny would indicate that man is heterozygous A?  
 (a) AB                      (b) A  
 (c) O                        (d) B                      (1991)
- 42.** Multiple alleles control inheritance of  
 (a) phenylketonuria        (b) colour blindness  
 (c) sickle cell anaemia    (d) blood groups.            (1991)
- 43.** The contrasting pairs of factors in Mendelian crosses are called  
 (a) multiple alleles        (b) allelomorphs  
 (c) alloboci                (d) paramorphs.            (1991)
- 44.** Mendel's last law is  
 (a) segregation  
 (b) dominance  
 (c) independent assortment  
 (d) polygenic inheritance.              (1991)
- 45.** Blue eye colour is recessive to brown eye colour. A brown eyed man whose mother was blue eyed marries a blue-eyed woman. The children will 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.              (1991)

46. RR (Red) *Antirrhinum* is crossed with white (WW) one. Offspring RW are pink. This is an example of  
(a) dominant-recessive  
(b) incomplete dominance  
(c) hybrid  
(d) supplementary genes. (1991)

47. ABO blood group system is due to  
(a) multifactor inheritance  
(b) incomplete dominance  
(c) multiple allelism  
(d) epistasis. (1990)

48. tt mates with Tt. What will be characteristic of offspring?  
(a) 75% recessive      (b) 50% recessive  
(c) 25% recessive      (d) All dominant (1990)

49. 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. (1988)

### 5.3 Inheritance of Two Genes

50. Experimental verification of the chromosomal theory of inheritance was done by  
(a) Mendel                (b) Sutton  
(c) Boveri                (d) Morgan. (NEET 2020)

51. What map unit (centimorgan) is adopted in the construction of genetic maps?  
(a) A unit of distance between genes on chromosomes, representing 50% cross over.  
(b) A unit of distance between two expressed genes, representing 10% cross over.  
(c) A unit of distance between two expressed genes, representing 100% cross over.  
(d) A unit of distance between genes on chromosomes, representing 1% cross over. (NEET 2019)

52. The frequency of recombination between gene present on the same chromosome as a measure of the distance between genes was explained by  
(a) Sutton Boveri      (b) T.H. Morgan  
(c) Gregor J.Mendel    (d) Alfred Sturtevant. (NEET 2019)

53. The mechanism that causes a gene to move from one linkage group to another is called  
(a) inversion              (b) duplication  
(c) translocation          (d) crossing-over. (NEET-II 2016)

54. In a test cross involving F<sub>1</sub> dihybrid flies, more parental-type offspring were produced than the recombinant-type offspring. This indicates  
(a) the two genes are linked and present on the same chromosome  
(b) both of the characters are controlled by more than one gene  
(c) the two genes are located on two different chromosomes  
(d) chromosomes failed to separate during meiosis. (NEET-I 2016)

55. The term "linkage" was coined by  
(a) G. Mendel              (b) W. Sutton  
(c) T.H. Morgan            (d) T. Boveri. (2015)
56. The movement of a gene from one linkage group to another is called  
(a) translocation           (b) crossing over  
(c) inversion               (d) duplication. (2015 Cancelled)

57. Fruit colour in squash is an example of  
(a) recessive epistasis  
(b) dominant epistasis  
(c) complementary genes  
(d) inhibitory genes. (2014)

58. Which of the following statements is not true of two genes that show 50% recombination frequency?  
(a) The genes show independent assortment.  
(b) If the genes are present on the same chromosome, they undergo more than one cross-overs in every meiosis.  
(c) The genes may be on different chromosomes.  
(d) The genes are tightly linked. (NEET 2013)

59. When two unrelated individuals or lines are crossed, the performance of F<sub>1</sub> hybrid is often superior to both its parents. This phenomenon is called  
(a) heterosis                (b) transformation  
(c) splicing                (d) metamorphosis. (2011)

60. Select the correct statement from the ones given below with respect to dihybrid cross.  
(a) Tightly linked genes on the same chromosomes show higher recombinations.  
(b) Genes far apart on the same chromosome show very few recombinations.  
(c) Genes loosely linked on the same chromosome show similar recombinations.  
(d) Tightly linked genes on the same chromosome show very few recombinations. (2010)



- 77.** When two dominant independently assorting genes react with each other, they are called  
 (a) collaborative genes (b) complementary genes  
 (c) duplicate genes (d) supplementary genes.  
 (1996)
- 78.** When two genetic loci produce identical phenotypes in *cis* and *trans* position, they are considered to be  
 (a) multiple alleles (b) the parts of same gene  
 (c) pseudoalleles (d) different genes. (1995)
- 79.** The phenomenon, in which an allele of one gene suppresses the activity of an allele of another gene, is known as  
 (a) epistasis (b) dominance  
 (c) suppression (d) inactivation. (1995)
- 80.** Which of the following is suitable for experiment on linkage?  
 (a) aaBB × aaBB (b) AABB × aabb  
 (c) AaBb × AaBb (d) AAbb × AaBB  
 (1993)
- 81.** Two dominant nonallelic genes are 50 map units apart. The linkage is  
 (a) *cis* type (b) *trans* type  
 (c) complete (d) absent/incomplete.  
 (1993)
- 82.** 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. (1993)
- 83.** In a cross between  $AABB \times aabb$ , the ratio of  $F_2$  genotypes between  $AABB$ ,  $AaBB$ ,  $Aabb$  and  $aabb$  would be  
 (a)  $9 : 3 : 3 : 1$  (b)  $2 : 1 : 1 : 2$   
 (c)  $1 : 2 : 2 : 1$  (d)  $7 : 5 : 3 : 1$ . (1992)
- 84.** Segregation of Mendelian factors (no linkage, no crossing over) occurs during  
 (a) anaphase I (b) anaphase II  
 (c) diplotene (d) metaphase I. (1992)
- 85.** The allele which is unable to express its effect in the presence of another is called  
 (a) codominant (b) supplementary  
 (c) complementary (d) recessive. (1991)
- 86.** Cross between  $AaBB$  and  $aaBB$  will form  
 (a)  $1AaBB : 1aaBB$  (b) all  $AaBB$   
 (c)  $3AaBB : 1aaBB$  (d)  $1AaBB : 3aaBB$ .  
 (1990)
- 87.** In a genetic cross having recessive epistasis,  $F_2$  phenotypic ratio would be  
 (a)  $9 : 6 : 1$  (b)  $15 : 1$   
 (c)  $9 : 3 : 4$  (d)  $12 : 3 : 1$ . (1990)
- 88.** Bateson used the terms coupling and repulsion for linkage and crossing over. Name the correct parental of coupling type alongwith its cross over or repulsion.  
 (a) Coupling  $AABB, aabb$ ; Repulsion  $AABB, aabb$   
 (b) Coupling  $AAbb, aaBB$ ; Repulsion  $AaBb, aabb$   
 (c) Coupling  $aaBB, aabb$ ; Repulsion  $AABB, aabb$   
 (d) Coupling  $AABB, aabb$ ; Repulsion  $AAbb, aaBB$   
 (1990)
- 89.** Segregation of Mendelian factor ( $Aa$ ) occurs during  
 (a) diplotene (b) anaphase I  
 (c) zygotene/pachytene (d) anaphase II. (1990)
- 90.** Two linked genes  $a$  and  $b$  show 20% recombination. the individuals of a dihybrid cross between  $++/++ \times ab/ab$  shall show gametes  
 (a)  $++ : 80 : : ab : 20$   
 (b)  $++ : 50 : : ab : 50$   
 (c)  $++ : 40 : : ab : 40 : : +a : 10 : : +b : 10$   
 (d)  $++ : 30 : : ab : 30 : : +a : 20 : : +b : 20$ . (1989)

## 5.4 Polygenic Inheritance

- 91.** Which of the following characteristics represent 'inheritance of blood groups' in humans?  
 (i) Dominance  
 (ii) Co-dominance  
 (iii) Multiple allele  
 (iv) Incomplete dominance  
 (v) Polygenic inheritance  
 (a) (ii), (iii) and (v) (b) (i), (ii) and (iii)  
 (c) (ii), (iv) and (v) (d) (i), (iii) and (v)  
 (NEET 2018)
- 92.** Inheritance of skin colour in humans is an example of  
 (a) point mutation  
 (b) polygenic inheritance  
 (c) codominance  
 (d) chromosomal aberration. (2007)
- 93.** How many different kinds of gametes will be produced by a plant having the genotype  $AABbCC$ ?  
 (a) Two (b) Three  
 (c) Four (d) Nine (2006)
- 94.** Which one of the following is an example of polygenic inheritance?  
 (a) Skin colour in humans  
 (b) Flower colour in *Mirabilis jalapa*  
 (c) Production of male honeybee  
 (d) Pod shape in garden pea (2006)

95. On selfing a plant of F<sub>1</sub>-generation with genotype "AABbCC", the genotypic ratio in F<sub>2</sub>-generation will be  
 (a) 3 : 1  
 (b) 1 : 1  
 (c) 9 : 3 : 3 : 1  
 (d) 27 : 9 : 9 : 9 : 3 : 3 : 3 : 1. (2002)

96. In human beings, multiple genes are involved in the inheritance of  
 (a) sickle-cell anaemia (b) skin colour  
 (c) colour blindness (d) phenylketonuria. (1999)

97. How many different types of genetically different gametes will be produced by a heterozygous plant having the genotype AABbCc?  
 (a) Six (b) Nine  
 (c) Two (d) Four (1998)

98. The polygenic genes show  
 (a) different karyotypes (b) different genotypes  
 (c) different phenotypes (d) none of these. (1996)

99. A polygenic inheritance in human beings is  
 (a) skin colour (b) phenylketonuria  
 (c) colour blindness (d) sickle cell anaemia. (1993)

## 5.5 Pleiotropy

100. 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 organism only one allele expresses itself
C. Pleiotropy (iii)	In a heterozygous organism both alleles express themselves fully
D. Polygenic (iv)	A single gene inheritance influences many characters

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

(NEET-I 2016)

101. A pleiotropic gene  
 (a) controls a trait only in combination with another gene  
 (b) controls multiple traits in an individual  
 (c) is expressed only in primitive plants  
 (d) is a gene evolved during Pliocene. (2015)

102. Which of the following is an example of pleiotropy?  
 (a) Haemophilia (b) Thalassemia  
 (c) Sickle cell anaemia (d) Colour blindness (2002)

103. When a single gene influences more than one trait it is called  
 (a) pseudodominance (b) pleiotropy  
 (c) epistasis (d) none of these. (1998)

## 5.6 Sex Determination

104. Select the incorrect statement.  
 (a) Human males have one of their sex-chromosome much shorter than other.  
 (b) Male fruit fly is heterogametic.  
 (c) In male grasshoppers, 50% of sperms have no sex-chromosome.  
 (d) In domesticated fowls, sex of progeny depends on the type of sperm rather than egg. (NEET 2019)

105. Which of the following pairs is wrongly matched?  
 (a) Starch synthesis in pea : Multiple alleles  
 (b) ABO blood grouping : Co-dominance  
 (c) XO type sex determination: Grasshopper  
 (d) T.H. Morgan : Linkage (NEET 2018)

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

- (a) Two X chromosomes  
 (b) Only one Y chromosome  
 (c) Only one X chromosome  
 (d) One X and one Y chromosome (Mains 2011)

107. In *Drosophila*, the sex is determined by  
 (a) the ratio of number of X-chromosome to the sets of autosomes  
 (b) X and Y chromosomes  
 (c) the ratio of pairs of X-chromosomes to the pairs of autosomes  
 (d) whether the egg is fertilized or develops parthenogenetically. (2003)

108. Number of Barr bodies in XXXX female is  
 (a) 1 (b) 2  
 (c) 3 (d) 4. (2001)

109. Male XX and female XY sometime occur due to  
 (a) deletion  
 (b) transfer of segments in X and Y chromosome  
 (c) aneuploidy  
 (d) hormonal imbalance. (2001)

110. Probability of four sons to a couple is  
 (a) 1/4 (b) 1/8  
 (c) 1/16 (d) 1/32. (2001)

**111.** Genetic identity of a human male is determined by  
(a) sex-chromosome      (b) cell organelles  
(c) autosome              (d) nucleolus. (1997)

**112.** When an animal has both the characters of male and female, it is called  
(a) super female      (b) super male  
(c) intersex              (d) gynandromorph. (1996)

**113.** Mr. Kapoor has Bb autosomal gene pair and d allele sex-linked. What shall be proportion of Bd in sperms?  
(a) Zero              (b) 1/2  
(c) 1/4              (d) 1/8 (1993)

**114.** Sex is determined in human beings  
(a) by ovum  
(b) at time of fertilisation  
(c) 40 days after fertilisation  
(d) seventh to eight week when genitals differentiate in fetus. (1993)

**115.** A normal green male maize is crossed with albino female. The progeny is albino because  
(a) trait for albinism is dominant  
(b) the albinos have biochemical to destroy plastids derived from green male  
(c) plastids are inherited from female parent  
(d) green plastids of male must have mutated. (1989)

**116.** A family of five daughter only is expecting sixth issue. The chance of its being a son is  
(a) zero              (b) 25%  
(c) 50%              (d) 100%. (1988)

## 5.7 Mutation

**117.** 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<sub>2</sub> 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. (2004)

**118.** The most striking example of point mutation is found in a disease called  
(a) Down's syndrome      (b) sickle cell anaemia  
(c) thalassaemia              (d) night blindness. (1995)

## 5.8 Genetic Disorders

**119.** Select the correct match.  
(a) Haemophilia      – Y linked  
(b) Phenylketonuria      – Autosomal dominant trait

(c) Sickle cell anaemia – Autosomal recessive trait, chromosome -11  
(d) Thalassemia      – X linked (NEET 2020)

**120.** What is the genetic disorder in which an individual has an overall masculine development, gynaecomastia and is sterile?  
(a) Down's syndrome  
(b) Turner's syndrome  
(c) Klinefelter's syndrome  
(d) Edward syndrome (NEET 2019)

**121.** A woman has an X-linked condition on one of her X chromosomes. This chromosome can be inherited by  
(a) only daughters  
(b) only sons  
(c) only grandchildren  
(d) both sons and daughters. (NEET 2018)

**122.** Thalassemia and sickle cell anaemia 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) Sickle cell anaemia is due to a quantitative problem of globin molecules.  
(d) Both are due to a qualitative defect in globin chain synthesis. (NEET 2017)

**123.** A disease caused by an autosomal primary non-disjunction is  
(a) Klinefelter's syndrome  
(b) Turner's syndrome  
(c) Sickle cell anaemia  
(d) Down's syndrome. (NEET 2017)

**124.** If a colour-blind man marries a woman who is homozygous for normal colour vision, the probability of their son being colour-blind is  
(a) 0              (b) 0.5  
(c) 0.75              (d) 1. (NEET-II 2016)

**125.** Pick out the correct statements.  
(1) Haemophilia is a sex-linked recessive disease.  
(2) Down's syndrome is due to aneuploidy.  
(3) Phenylketonuria is an autosomal recessive gene disorder.  
(4) Sickle cell anaemia is an X-linked recessive gene disorder.  
(a) (1), (3) and (4) are correct.  
(b) (1), (2) and (3) are correct.  
(c) (1) and (4) are correct.  
(d) (2) and (4) are correct. (NEET-I 2016)

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

- (a) Chromosomal disorder
- (b) Dominant gene disorder
- (c) Recessive gene disorder
- (d) X-linked recessive gene disorder

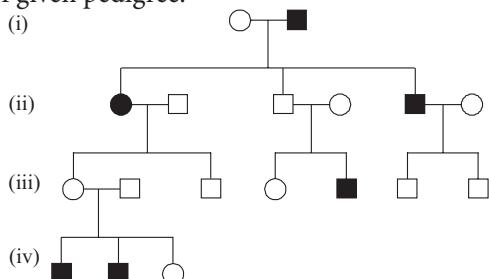
(NEET-I 2016)

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

- (a) Nil
- (b) 0.25
- (c) 0.5
- (d) 1

(2015)

**128.** In the following human pedigree, the filled symbols represent the affected individuals. Identify the type of given pedigree.



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

(2015)

**129.** An abnormal human baby with 'XXX' sex chromosomes was born due to

- (a) fusion of two ova and one sperm
- (b) fusion of two sperms and one ovum
- (c) formation of abnormal sperms in the father
- (d) formation of abnormal ova in the mother.

(2015 Cancelled)

**130.** 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%

(2014)

**131.** 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.

(2014)

**132.** Select the incorrect statement with regard to haemophilia.

- (a) It is a dominant disease.

(b) A single protein involved in the clotting of blood is affected.

(c) It is a sex-linked disease.

(d) It is a recessive disease.

(NEET 2013)

**133.** 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%

(NEET 2013)

**134.** Which one is the incorrect statement with regard to the importance of pedigree analysis?

- (a) It confirms that DNA is the carrier of genetic information.
- (b) It helps to understand whether the trait in question is dominant or recessive.
- (c) It confirms that the trait is linked to one of the autosome.
- (d) It helps to trace the inheritance of a specific trait.

(Karnataka NEET 2013)

**135.** Down's syndrome in humans is due to

- (a) three 'X' chromosomes
- (b) three copies of chromosome 21
- (c) monosomy
- (d) two 'Y' chromosomes.

(Karnataka NEET 2013)

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

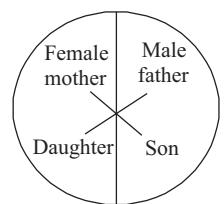
- (a) 100%
- (b) Zero percent
- (c) 25%
- (d) 50%

(2012)

**137.** Represented here is the inheritance pattern of a certain type of trait in humans. Which one of the following conditions could be an example of this pattern?

- (a) Phenylketonuria
- (b) Sickle cell anaemia
- (c) Haemophilia
- (d) Thalassemia

(Mains 2012)



**138.** Which one of the following conditions correctly describes the manner of determining the sex?

- (a) Homozygous sex chromosomes (ZZ) determine female sex in birds.
- (b) XO type of sex chromosomes determine male sex in grasshopper.
- (c) XO condition in humans as found in Turner's syndrome, determines female sex.
- (d) Homozygous sex chromosomes (XX) produce male in *Drosophila*.

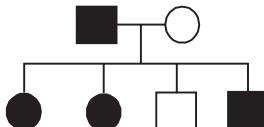
(2011)

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

- (a)  = Mating between relatives
- (b)  = Unaffected male
- (c)  = Unaffected female
- (d)  = Male affected

(2010)

**140.** Study the pedigree chart of a certain family given below and select the correct conclusion which can be drawn for the character.



- (a) The female parent is heterozygous.
- (b) The parents could not have had a normal daughter for this character.
- (c) The trait under study could not be colour blindness.
- (d) The male parent is homozygous dominant.

(Mains 2010)

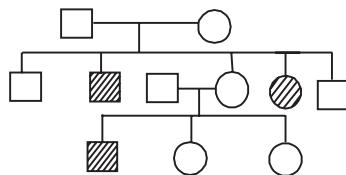
**141.** Select the incorrect statement from the following.

- (a) Galactosemia is an inborn error 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. (2009)

**142.** 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) characterized by elongated sickle like RBCs with a nucleus
- (d) an autosomal linked dominant trait. (2009)

**143.** Study the pedigree chart given below. What does it show?



- (a) Inheritance of a condition like phenylketonuria as an autosomal recessive trait.
- (b) The pedigree chart is wrong as this is not possible.
- (c) Inheritance of a recessive sex-linked disease like haemophilia.
- (d) Inheritance of a sex-linked inborn error of metabolism like phenylketonuria. (2009)

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

- (a) Erythroblastosis fetalis - X-linked
- (b) Down's syndrome - 44 autosomes + XO
- (c) Klinefelter's syndrome - 44 autosomes + XYY
- (d) Colour blindness - Y-linked

(2008)

**145.** Both sickle cell anaemia and Huntington's chorea are

- (a) virus-related diseases
- (b) bacteria-related diseases
- (c) congenital disorders
- (d) pollutant-induced disorders. (2006)

**146.** If a colour blind woman marries a normal visioned man, their sons will be

- (a) all colour blind
- (b) all normal visioned
- (c) one-half colour blind and one-half normal
- (d) three-fourths colour blind and one-fourth normal. (2006)

**147.** Cri-du-chat syndrome in humans is caused by the

- (a) trisomy of 21<sup>st</sup> chromosome
- (b) fertilisation of an XX egg by a normal Y-bearing sperm
- (c) loss of half of the short arm of chromosome 5
- (d) loss of half of the long arm of chromosome 5. (2006)

**148.** Sickle cell anaemia has not been eliminated from the African population because

- (a) it is controlled by dominant genes
- (b) it is controlled by recessive genes
- (c) it is not a fatal disease
- (d) it provides immunity against malaria. (2006)

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

- (a) Sex-linked dominant
- (b) Sex-linked recessive
- (c) Sex-limited recessive
- (d) Autosomal dominant (2005)

**150.** A woman with 47 chromosomes due to three copies of chromosome 21 is characterised by

- (a) superfemaleness
- (b) triploidy
- (c) Turner's syndrome
- (d) Down's syndrome. (2005)

**151.** Haemophilia is more commonly seen in human males than in human females because  
(a) a greater proportion of girls die in infancy  
(b) this disease is due to a Y-linked recessive mutation  
(c) this disease is due to an X-linked recessive mutation  
(d) this disease is due to an X-linked dominant mutation. (2005)

**152.** Which of the following is not a hereditary disease?  
(a) Cystic fibrosis (b) Thalassaemia  
(c) Haemophilia (d) Cretinism (2005)

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

- (a) may be colour blind or may be of normal vision
- (b) must be colour blind
- (c) must have normal colour vision
- (d) will be partially colour blind since he is heterozygous for the colour blind mutant allele.

(2005)

**154.** A male human is heterozygous for autosomal genes A and B and is also hemizygous for haemophilic gene h. What proportion of his sperms will be abh?  
(a) 1/8 (b) 1/32  
(c) 1/16 (d) 1/4 (2004)

**155.** A normal woman, whose father was colour-blind is married to a normal man. The sons would be  
(a) 75% colour-blind (b) 50% colour-blind  
(c) all normal (d) all colour-blind. (2004)

**156.** The recessive genes located on X-chromosome humans are always  
(a) lethal (b) sub-lethal  
(c) expressed in males (d) expressed in females. (2004)

**157.** Pattern baldness, moustaches and beard in human males are examples of  
(a) sex linked traits  
(b) sex limited traits  
(c) sex influenced traits  
(d) sex determining traits. (2003)

**158.** Which one of the following conditions though harmful in itself, is also potential saviour from a mosquito borne infectious disease?  
(a) Thalassaemia  
(b) Sickle cell anaemia  
(c) Pernicious anaemia  
(d) Leukaemia (2003)

**159.** Down's syndrome is caused by an extra copy of chromosome number 21. What percentage of offspring produced by an affected mother and a normal father would be affected by this disorder?  
(a) 100% (b) 75%  
(c) 50% (d) 25% (2003)

**160.** Christmas disease is another name for  
(a) haemophilia B (b) hepatitis B  
(c) Down's syndrome (d) sleeping sickness. (2003)

**161.** A diseased man marries a normal woman. They get three daughters and five sons. All the daughters were diseased and sons were normal. The gene of this disease is  
(a) sex linked dominant (b) sex linked recessive  
(c) sex limited character (d) autosomal dominant. (2002)

**162.** Which of the following is a correct match?  
(a) Down's syndrome - 21<sup>st</sup> chromosome  
(b) Sickle cell anaemia - X-chromosome  
(c) Haemophilia - Y-chromosome  
(d) Parkinson's disease - X and Y chromosomes (2002)

**163.** Sickle cell anaemia induce to  
(a) change of amino acid in  $\alpha$ -chain of haemoglobin  
(b) change of amino acid in  $\beta$ -chain of haemoglobin  
(c) change of amino acid in both  $\alpha$  and  $\beta$  chains of haemoglobin  
(d) change of amino acid either  $\alpha$  or  $\beta$  chains of haemoglobin. (2001)

**164.** Mongolian Idiocy due to trisomy in 21<sup>st</sup> chromosome is called  
(a) Down's syndrome  
(b) Turner's syndrome  
(c) Klinefelter's syndrome  
(d) Triple X syndrome. (2000)

**165.** In *Drosophila*, the XXY condition leads to femaleness whereas in human beings the same condition leads to Klinefelter's syndrome in male. It proves  
(a) in human beings Y chromosome is active in sex determination  
(b) Y chromosome is active in sex determination in both human beings and *Drosophila*  
(c) in *Drosophila* Y chromosome decides femaleness  
(d) Y chromosome of man have genes for syndrome. (2000)

**166.** A marriage between normal visioned man and colour blind woman will produce offspring  
(a) colour blind sons and 50% carrier daughter  
(b) 50% colourblind sons and 50% carrier daughter  
(c) normal males and carrier daughters  
(d) colour blind sons and carrier daughters. (1999)

**167.** Haemophilic man marries a normal woman. Their offspring will be  
(a) all haemophilic  
(b) all boys haemophilic  
(c) all girls haemophilic  
(d) all normal. (1999)

**168.** A woman with two genes for haemophilia and one gene for colour blindness on one of the 'X' chromosomes marries a normal man. How will the progeny be?  
(a) 50% haemophilic colour-blind sons and 50% normal sons.  
(b) 50% haemophilic daughters (carrier) and 50% colour blind daughters (carrier).  
(c) All sons and daughters haemophilic and colour-blind.  
(d) Haemophilic and colour-blind daughters. (1998)

**169.** Mental retardation in man, associated with sex chromosomal abnormality is usually due to  
(a) moderate increase in Y complement  
(b) large increase in Y complement  
(c) reduction in X complement  
(d) increase in X complement. (1998)

**170.** Albinism is known to be due to an autosomal recessive mutation. The first child of a couple with normal skin pigmentation was an albino. What is the probability that their second child will also be an albino?  
(a) 50% (b) 75%  
(c) 100% (d) 25% (1998)

**171.** A person with the sex chromosomes XXY suffers from  
(a) gynandromorphism  
(b) Klinefelter's syndrome  
(c) Down's syndrome  
(d) Turner's syndrome. (1997)

**172.** In which of the following diseases, the man has an extra X-chromosome?  
(a) Turner's syndrome (b) Klinefelter's syndrome  
(c) Down's syndrome (d) Haemophilia (1996)

**173.** A person whose father is colour blind marries a lady whose mother is daughter of a colour blind man. Their children will be  
(a) all sons colour blind  
(b) some sons normal and some colour blind  
(c) all colour blind  
(d) all daughters normal. (1996)

**174.** A genetically diseased father (male) marries with a normal female and gives birth to 3 carrier girls and 5 normal sons. It may be which type of genetic disease?  
(a) Sex-influenced disease  
(b) Blood group inheritance disease  
(c) Sex-linked disease  
(d) Sex-recessive disease (1996)

**175.** An abnormal human male phenotype involving an extra X-chromosome (XXY) is a case of  
(a) Edward's syndrome  
(b) Klinefelter's syndrome  
(c) intersex  
(d) Down's syndrome. (1995)

**176.** The genes, which remain confined to differential region of Y-chromosome, are  
(a) autosomal genes (b) holandric genes  
(c) completely sex-linked genes  
(d) mutant genes. (1994)

**177.** Albinism is a congenital disorder resulting from the lack of which enzyme?  
(a) Tyrosinase (b) Xanthine oxidase  
(c) Catalase (d) Fructokinase (1994)

**178.** The colour blindness is more likely to occur in males than in females because  
(a) the Y-chromosome of males have the genes for distinguishing colours  
(b) genes for characters are located on the sex-chromosomes  
(c) the trait is dominant in males and recessive in females  
(d) none of these. (1994)

**179.** Of both normal parents, the chances of a male child becoming colour blind are  
(a) none  
(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. (1993)

**180.** Of a normal couple, half the sons are haemophiliac 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. (1993)

- 181.** A colour blind 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. (1992)
- 182.** Down's syndrome is due to  
 (a) crossing over  
 (b) linkage  
 (c) sex-linked inheritance  
 (d) non-disjunction of chromosomes. (1992)
- 183.** In human beings 45 chromosomes/single X/XO abnormality causes  
 (a) Down's syndrome  
 (b) Klinefelter's syndrome  
 (c) Turner's syndrome  
 (d) Edward's syndrome. (1992)
- 184.** A colour blind girl is rare because she will be born only when  
 (a) her mother and maternal grand father were colour blind  
 (b) her father and maternal grand father were colour blind

- (c) her mother is colour blind and father has normal vision  
 (d) parents have normal vision but grand parents were colour blind. (1991)
- 185.** In Down's syndrome of a male child, the sex complement is  
 (a) XO (b) XY  
 (c) XX (d) XXY. (1990)
- 186.** 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. (1990)
- 187.** Which one is a hereditary disease?  
 (a) Cataract (b) Leprosy  
 (c) Blindness (d) Phenylketonuria (1990)
- 188.** 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%. (1990)

### ANSWER KEY

- |          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1. (c)   | 2. (a)   | 3. (d)   | 4. (d)   | 5. (b)   | 6. (b)   | 7. (d)   | 8. (d)   | 9. (b)   | 10. (d)  |
| 11. (c)  | 12. (a)  | 13. (b)  | 14. (c)  | 15. (b)  | 16. (a)  | 17. (a)  | 18. (a)  | 19. (c)  | 20. (b)  |
| 21. (d)  | 22. (a)  | 23. (c)  | 24. (c)  | 25. (a)  | 26. (c)  | 27. (c)  | 28. (c)  | 29. (c)  | 30. (d)  |
| 31. (c)  | 32. (d)  | 33. (a)  | 34. (c)  | 35. (a)  | 36. (c)  | 37. (c)  | 38. (d)  | 39. (a)  | 40. (d)  |
| 41. (d)  | 42. (d)  | 43. (b)  | 44. (c)  | 45. (a)  | 46. (b)  | 47. (c)  | 48. (b)  | 49. (c)  | 50. (d)  |
| 51. (d)  | 52. (d)  | 53. (c)  | 54. (a)  | 55. (c)  | 56. (a)  | 57. (b)  | 58. (d)  | 59. (a)  | 60. (d)  |
| 61. (d)  | 62. (a)  | 63. (c)  | 64. (b)  | 65. (c)  | 66. (b)  | 67. (a)  | 68. (a)  | 69. (b)  | 70. (d)  |
| 71. (b)  | 72. (a)  | 73. (c)  | 74. (a)  | 75. (b)  | 76. (c)  | 77. (b)  | 78. (c)  | 79. (a)  | 80. (b)  |
| 81. (d)  | 82. (b)  | 83. (c)  | 84. (a)  | 85. (d)  | 86. (a)  | 87. (c)  | 88. (d)  | 89. (b)  | 90. (c)  |
| 91. (b)  | 92. (b)  | 93. (a)  | 94. (a)  | 95. (a)  | 96. (b)  | 97. (d)  | 98. (c)  | 99. (a)  | 100. (d) |
| 101. (b) | 102. (c) | 103. (b) | 104. (d) | 105. (a) | 106. (a) | 107. (c) | 108. (c) | 109. (b) | 110. (c) |
| 111. (a) | 112. (d) | 113. (c) | 114. (b) | 115. (c) | 116. (c) | 117. (b) | 118. (b) | 119. (c) | 120. (c) |
| 121. (d) | 122. (b) | 123. (d) | 124. (a) | 125. (b) | 126. (d) | 127. (b) | 128. (a) | 129. (d) | 130. (c) |
| 131. (a) | 132. (a) | 133. (a) | 134. (a) | 135. (b) | 136. (b) | 137. (c) | 138. (b) | 139. (a) | 140. (a) |
| 141. (c) | 142. (b) | 143. (a) | 144. (c) | 145. (c) | 146. (a) | 147. (c) | 148. (d) | 149. (b) | 150. (d) |
| 151. (c) | 152. (d) | 153. (a) | 154. (a) | 155. (b) | 156. (c) | 157. (c) | 158. (b) | 159. (c) | 160. (a) |
| 161. (a) | 162. (a) | 163. (b) | 164. (a) | 165. (a) | 166. (d) | 167. (d) | 168. (b) | 169. (d) | 170. (d) |
| 171. (b) | 172. (b) | 173. (d) | 174. (c) | 175. (b) | 176. (b) | 177. (a) | 178. (b) | 179. (d) | 180. (c) |
| 181. (a) | 182. (d) | 183. (c) | 184. (b) | 185. (b) | 186. (d) | 187. (d) | 188. (a) |          |          |