

Exercise - I (Conceptual Questions)

Build Up Your Understanding

MENDELISM

1. On which plant Mendel had carried out his investigations :-

(1) Garden - pea (2) Wild pea
(3) Cow-pea (4) Pigeon pea

BPV001

2. During breeding the removal of anthers from a flower is called :-

(1) Anthesis (2) Pollination
(3) Emasculation (4) Vasectomy

BPV002

3. Mendel formulated the law of purity of gametes on the basis of :-

(1) Dihybrid cross (2) Monohybrid cross
(3) Back cross (4) Test cross

BPV003

4. A cross between AaBB X aaBB yields a genotypic ratio of :-

(1) 1 AaBB : 1 aaBB (2) 1 AaBB : 3 aaBB
(3) 3AaBB : 1 aa BB (4) All AaBb

BPV004

5. In monohybrid cross what is the ratio of homozygous dominant and homozygous recessive individuals in F₂-generation :-

(1) 1:2:1 (2) 2:1 / 1:2
(3) 3:1 / 1:3 (4) 1:1

BPV005

6. The cross between recessive to it's hybrid or it's F₁ plant is called :-

(1) Back cross
(2) Test cross
(3) Monohybrid cross
(4) Dihybrid cross

BPV006

7. What is the genotypic and phenotypic ratio of monohybrid test cross :-

(1) 1:1 (2) 1:2 (3) 3:1 (4) 1:2:1

BPV007

8. Which law can be proved only by dihybrid cross?

(1) Segregation
(2) Purity of gametes
(3) Dominance
(4) Independent assortment

BPV008

9. How many types & in what ratio the gametes are produced by a dihybrid heterozygous :-

(1) 4 types in the ratio of 9:3:3:1
(2) 2 types in the ratio of 3:1
(3) 3 types in the ratio of 1:2:1
(4) 4 types in the ratio of 1:1:1:1

BPV009

10. How many gametes are produced in F₁ generation of a trihybrid :-

(1) 3 (2) 4 (3) 8 (4) 16

BPV010

11. Which genotype represents a true dihybrid condition

(1) tt rr (2) Tt rr
(3) Tt Rr (4) TT Rr

BPV011

12. Mendelian ratio 9:3:3:1 is due to :-

(1) Law of segregation
(2) Law of purity of gametes
(3) Law of independent assortment
(4) Law of unit characters

BPV012

- 13.** In a cross between a pure tall plant with green pod & a pure short plant with yellow pod. How many short plants are produced in F_2 generation out of 16 :-
 (1) 1 (2) 3 (3) 4 (4) 9
BPV013
- 14.** In a dihybrid cross between AABB and aabb the ratio of AABB, AABb, aaBb, aabb in F_2 generation is :-
 (1) 9:3:3:1 (2) 1:1:1:1
 (3) 1:2:2:1 (4) 1:1:2:2
BPV014
- 15.** AABbCc genotype forms how many types of gametes :-
 (1) 4 (2) 8 (3) 2 (4) 6
BPV015
- 16.** Who rediscovered the results of Mendel's experiments :-
 (1) DeVries, Tschermak, Correns
 (2) DeVries, Tschermak, Morgan
 (3) Tschermak, Morgan, Correns
 (4) Tschermak, Bateson, Punnet
BPV016
- 17.** Crossing AABB & aabb, the probability of AaBb in F_2 generation would be :-
 (1) $1/16$ (2) $2/16$
 (3) $8/16$ (4) $4/16$
BPV017
- 18.** In Mendel's experiments, colour of seed, colour of flower, position of flower, colour of pod, height of stem, are called :-
 (1) Alleles
 (2) Genotype
 (3) Phenotype
 (4) All of the above
BPV018
- 19.** If 120 Plants are produced on crossing pure red and pure white flowered pea plants, then the ratio of offsprings in F_1 will be :- (Red is dominant)
 (1) 90 Red : 30 White (2) 30 Red : 90 White
 (3) 60 Red : 60 White (4) All Red
BPV019
- 20.** An individual with two identical members of a pair of genetic factors is called :-
 (1) Hemizygous (2) Heterozygous
 (3) Nonhomologous (4) Homozygous
BPV020
- 21.** Two allelic genes are located on :-
 (1) The same chromosome
 (2) Two homologous chromosomes
 (3) Two-non-homologous chromosomes
 (4) Any two chromosomes
BPV021
- 22.** The percentage of ab gametes produced by AaBb parent will be :-
 (1) 12.5 (2) 25 (3) 50 (4) 75
BPV022
- 23.** How many characters of pea pod were chosen by Mendel?
 (1) 7 (2) 5 (3) 4 (4) 2
BPV023
- 24.** Mendel's law of segregation is based on separation of alleles during :-
 (1) Gamete formation
 (2) Seed formation
 (3) Pollination
 (4) Embryonic development
BPV024
- 25.** When two hybrids Ttrr & Rrtt are crossed, the phenotypic ratio of offspring shall be :-
 (1) 3:1 (2) 1:1:1:1
 (3) 1:1 (4) 9:3:3:1
BPV025

- 26.** Which technique is used by Mendel for hybridisation :-
 (1) Emasculation (2) Bagging
 (3) Protoplast fusion (4) Both (1) & (2)
BPV027
- 27.** When flowers are unisexual then emasculation is done in :-
 (1) Female (2) Male
 (3) 1 & 2 both (4) None of these
BPV028
- 28.** How many plants are dihybrid in F_2 generation of dihybrid cross :-
 (1) One (2) Two
 (3) Four (4) Sixteen
BPV029
- 29.** When a plant has two different alleles of a gene then it is called :-
 (1) Homozygous (2) Dioecious
 (3) Heterozygous (4) Monoecious
BPV030
- 30.** Heterozygous tall plants were crossed with dwarf plants. What will be the ratio of dwarf plants in the progeny :-
 (1) 50% (2) 25% (3) 75% (4) 100%
BPV031
- 31.** A pure tall plant can be differentiated from a hybrid tall plant :-
 (1) By measuring length of plant
 (2) By spraying gibberellins
 (3) If all plants are tall after self-pollination
 (4) If all plants are dwarf after self-pollination
BPV032
- 32.** Genetic constitution of an individual is represented by :-
 (1) Genome (2) Genotype
 (3) Phenotype (4) Karyotype
BPV033
- 33.** Genes do not occur in pairs in :-
 (1) Zygote (2) Somatic cell
 (3) Embryo (4) Gametes
BPV034
- 34.** "Like begets like" an important and universal phenomenon of life, is due to :-
 (1) Eugenics (2) Inheritance
 (3) Dominance (4) Crossing-over
BPV035
- 35.** How many types of gametes are expected from the organism with genotype AABBCc:-
 (1) One (2) Two
 (3) Four (4) Eight
BPV036
- 36.** One of the following did not constitute the seven contrasting pairs of characters noticed by Mendel?
 (1) Height of the plants
 (2) Shape of the leaves
 (3) Shape of pod
 (4) Colour of pod
BPV037
- 37.** According to Mendelism which character is showing dominance :-
 (1) Terminal position of flower
 (2) Green colour in seed
 (3) Wrinkled seeds
 (4) Green pod colour
BPV038
- 38.** Due to the cross between $TTRr \times ttrr$ the resultant progenies showed how many percent plants would be, tall, red flowered:-
 (1) 50% (2) 75%
 (3) 25% (4) 100%
BPV039

39. A gene is said to be dominant if :-
 (1) It express it's effect only in homozygous stage.
 (2) It is expressed only in heterozygous condition.
 (3) It is expressed both in homozygous and heterozygous condition.
 (4) It is never expressed in any condition.

BPV041

40. A plant of F_1 generation with genotype "AABbCC". On selfing of this plant what is the phenotypic ratio in F_2 generation :-
 (1) 3 : 1
 (2) 1 : 1
 (3) 9 : 3 : 3 : 1
 (4) 27 : 9 : 9 : 9 : 3 : 3 : 3 : 1

BPV042

41. Which one of the following traits of garden pea studied by Mendel, was a recessive feature?
 (1) Axial flower position
 (2) Green seed colour
 (3) Green pod colour
 (4) Round seed shape

BPV043

42. A trihybrid cross is made between two plants with genotypes A/a B/b C/c how many offsprings of such cross will have a genotype a/a b/b c/c ?
 (1) 1/64 (2) 1/4
 (3) 1/16 (4) 1/32

BPV044

43. When a red flower homozygous pea plant is crossed with a white flower plant what colour is produced in F_1 generation:-
 (1) Red (2) White
 (3) Pink (4) Red + white

BPV047

44. If a heterozygous tall plant is crossed with a homozygous dwarf plant then what shall be the percentage of dwarf offsprings :-
 (1) 25% (2) 100% (3) 75% (4) 50%

BPV048

45. If a homozygous tall plant is crossed with a dwarf plant, what shall be the ratio of plants in offsprings :-
 (1) All heterozygous tall
 (2) Two tall & Two dwarf
 (3) 1:2:1
 (4) All homozygous dwarf

BPV049

46. How many different types of gametes can be formed by F_1 progeny, resulting from the following cross: AA BB CC x aa bb cc ?
 (1) 3 (2) 8 (3) 27 (4) 64

BPV050

47. Law of independent assortment of Mendel was proved by :-
 (1) Monohybrid cross
 (2) Reciprocal cross
 (3) Dihybrid cross
 (4) Back cross

BPV051

48. Mendel did not select which character in his experiment :-
 (1) Plant height (2) Plant colour
 (3) Pod shape (4) Pod colour

BPV052

49. Genes controlling seven traits in pea studied by Mendel were actually located on:-
 (1) Seven chromosomes
 (2) Six chromosomes
 (3) Four chromosomes
 (4) Five chromosomes

BPV053

50. Two crosses between the same pair of genotypes or phenotypes in which the sources of the gametes are reversed in one cross, is known as :-
 (1) Test cross (2) Reciprocal cross
 (3) Dihybrid cross (4) Reverse cross
BPV054
51. If selfing occurs in the plant having genotype $RrYy$, then ratio of given genotype will be :- $RRYY, RrYY, RRYy, RrYy$
 (1) 1:2:2:4 (2) 1:2:2:1
 (3) 1:1:1:1 (4) 2:2:2:1
BPV055
52. A self fertilizing trihybrid plant forms :-
 (1) 8 different gametes and 32 zygotes
 (2) 8 different gametes and 64 zygotes
 (3) 4 different gametes and 16 zygotes
 (4) 8 different gametes and 16 zygotes
BPV057
53. Segregation of genes take place during :-
 (1) Metaphase (2) Anaphase
 (3) Prophase (4) Embryo formation
BPV058
54. When an F_1 individual is crossed with its either of the two parent. Then it is known as:-
 (1) Test cross (2) Back cross
 (3) Reciprocal cross (4) Monohybrid cross
BPV060
55. If a homozygous red flowered plant is crossed with white plant, the offspring will be :-
 (1) All red flowered
 (2) All white flowered
 (3) Half red flowered
 (4) Half white flowered
BPV061
56. How many types of genotypes are formed in F_2 progeny obtained from self pollination of a dihybrid F_1 :-
 (1) 9 (2) 3 (3) 6 (4) 1
BPV062
57. A test cross is performed :-
 (1) by selfing of F_2 generation plants
 (2) by selfing of F_1 generation plants
 (3) to determine whether F_1 plant is homozygous or heterozygous
 (4) between a homozygous dominant and homozygous recessive plant
BPV064
58. If a cross is made between AA and aa , the nature of F_1 progeny will be :-
 (1) genotypically AA , phenotypically a
 (2) genotypically Aa , phenotypically a
 (3) genotypically Aa , phenotypically A
 (4) genotypically aa , phenotypically A
BPV065
59. When a tall plant with round seeds ($TTRR$) is crossed with a dwarf plant with wrinkled seeds ($ttrr$), the F_1 generation consists of tall plants with rounded seeds. How many types of gametes F_1 plant would produce :-
 (1) One (2) Three
 (3) Four (4) Eight
BPV066
60. A pure tall and a pure dwarf plant were crossed to produce offsprings. Offsprings were self crossed, then find out the ratio between true breeding tall to true breeding dwarf :-
 (1) 1 : 1 (2) 3 : 1
 (3) 2 : 1 (4) 1 : 2 : 1
BPV067

61. If hybrid red flowered plants of pea are crossed back to pure red flowered parent, the progeny will show :-
 (1) All red flowered plants
 (2) White flowered plants
 (3) 50% red and 50% white flowered plants
 (4) 3 Red : 1 white flowered plants

BPV068

62. What result Mendel would have got when he self pollinated a dwarf F_2 plant ?
 (1) All tall plants
 (2) Tall and dwarf plants in 3:1 ratio
 (3) All dwarf plants
 (4) Tall and dwarf plants in 1:1 ratio

BPV069

63. Mendel's laws of inheritance are applicable on the plants which :-
 (1) Reproduce asexually
 (2) Reproduce sexually
 (3) Reproduce vegetatively
 (4) All of the above plants

BPV070

64. Dihybrid test cross ratio proposed by Mendel is :-
 (1) 9 : 3 : 3 : 1
 (2) 1 : 1 : 1 : 1
 (3) 1 : 2 : 2 : 4 : 1 : 2 : 1 : 2 : 1
 (4) 3 : 1

BPV071

65. A cross between pure tall pea plant with green pods and dwarf pea with yellow pods will produce how many tall F_2 plants, out of 16 ?
 (1) 15
 (2) 13
 (3) 12
 (4) 7

BPV072

66. Mendel's Principle of segregation means that the gamete cells always receive :-
 (1) one pair of alleles
 (2) one quarter of the genes
 (3) one of the paired alleles
 (4) any pair of alleles

BPV073

67. How many types of genetically different gametes will be produced by a heterozygous plant having the genotype AABbCc?
 (1) Two (2) Four (3) Six (4) Nine

BPV074

68. The phenotypic ratio in a back cross between a trihybrid and homozygous recessive parent would be :-
 (1) 1 : 1
 (2) 1 : 1 : 1 : 1
 (3) 1 : 1 : 1 : 1 : 1 : 1
 (4) 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1

BPV075

69. Among the seven characters in pea plant, studied by Mendel, the number of characters related to flower, pod and seed respectively was:-
 (1) 2, 2, 2 (2) 2, 2, 1
 (3) 1, 2, 2 (4) 1, 1, 2

BPV076

70. Some of the dominant traits studied by Mendel were :-
 (1) Round seed shape, constricted pod shape and axial flower position
 (2) Yellow seed colour, inflated pod shape and axial flower position
 (3) Yellow seed colour, violet flower colour and yellow pod colour
 (4) Axial flower position, green pod colour and green seed colour

BPV077

71. The colour based characters in seven characters studied by Mendel in pea were:-
 (1) 1 (2) 2 (3) 3 (4) 4

BPV078

72. Mendel observed that all the F_1 progeny plants :-
 (1) resembled either one of the parents
 (2) resembled neither of the parents
 (3) resembled both of the parents
 (4) shows 3 : 1 ratio

BPV079

73. According to Mendel, "factors" or "genes" -
 (1) are the units of inheritance
 (2) contain information that is required to express a particular trait
 (3) Both (1) and (2)
 (4) None of the above

BPV080

74. The phenotype of any character will not be affected if the modified allele produces :-
 (1) Normal enzyme
 (2) Non-functional enzyme
 (3) No-enzyme at all
 (4) Both (2) and (3)

BPV081

75. The recessive characters are :-
 (1) Only expressed in heterozygous condition
 (2) Only expressed in homozygous condition
 (3) Blend in heterozygous condition
 (4) Always impure

BPV082

ALLELIC GENE INTERACTIONS

76. In *Mirabilis* & *Antirrhinum* plant the appearance of the pink hybrid (Rr) between cross of a red (RR) and white (rr) flower parent indicates :

- (1) Incomplete dominance
 (2) Segregation
 (3) Dominance
 (4) Heterosis

BPV083

77. RR(red) is crossed with rr (white). All Rr offsprings are pink. This indicates that R-gene is :-
 (1) Hybrid
 (2) Incompletely dominant
 (3) Recessive
 (4) Mutant

BPV084

78. In case of incomplete dominance the F_2 phenotypic ratio in monohybrid cross will be:-
 (1) 1 : 2 : 1 (2) 3 : 1 : 1
 (3) 9 : 3 : 3 : 1 (4) 2 : 3 : 1

BPV085

79. When the phenotypic and genotypic ratios resemble in the F_2 generation it is an example of :-
 (1) Independent assortment
 (2) Qualitative inheritance
 (3) Segregation of factors
 (4) Incomplete dominance

BPV086

80. In *Mirabilis jalapa* when homozygous red flowered and white flowered plants are crossed, all F_1 plants have pink coloured flowers. In F_2 produced by selfing of F_1 plants, red, pink, white flowered plants would appear respectively in the ratio of :-
 (1) 1 : 1 : 2 (2) 2 : 1 : 1
 (3) 1 : 0 : 1 (4) 1 : 2 : 1

BPV087

81. In case of incomplete dominance, F_2 generation has:-
 (1) Genotypic ratio equal to phenotypic ratio
 (2) Genotypic ratio is 3 : 1
 (3) Phenotypic ratio is 3 : 1
 (4) None of these
BPV088
82. Incomplete dominance occurs in :-
 (1) *Mirabilis*
 (2) *Antirrhinum*
 (3) Andalusian fowl
 (4) All of the above
BPV089
83. Which cross yields red, white & pink flowers variety of dog flower :-
 (1) $RR \times Rr$ (2) $Rr \times RR$
 (3) $Rr \times Rr$ (4) $Rr \times rr$
BPV090
84. Which of the following is exception to Mendel's laws?
 (1) Linkage
 (2) Incomplete dominance
 (3) Co-dominance
 (4) All of the above
BPV091
85. In a dihybrid cross, when one pair of alleles show incomplete dominance, genotypic ratio comes to :-
 (1) 3 : 6 : 3 : 1 : 2 : 1
 (2) 1 : 2 : 2 : 4 : 1 : 2 : 1 : 2 : 1
 (3) 9 : 3 : 3 : 1
 (4) 1 : 2 : 1
BPV092
86. Which of the following is the example of co-dominance :-
 (1) $Hb^A Hb^A, I^A I^B$ (2) $Hb^S Hb^S, I^A I^B$
 (3) $Hb^A Hb^S, I^A I^B$ (4) $Hb^S Hb^S, I^A I^A$
BPV093
87. Which of the following conditions represent a case of co-dominant genes?
 (1) A gene expresses itself, suppressing the phenotypic effect of its alleles
 (2) Genes that are similar in phenotypic effect when present separately, but when together interact to produce a different trait
 (3) Allele, both of which interact to produce a trait, which may resemble either of the parental type.
 (4) Alleles, each of which produces an independent effect in heterozygous condition.
BPV094
88. The phenomenon of incomplete dominance was observed by :-
 (1) De Vries (2) Correns
 (3) Tschermak (4) None
BPV095
89. Mendel did not propose :-
 (1) Dominance
 (2) Incomplete dominance
 (3) Segregation
 (4) Independent assortment
BPV096
90. AB - Blood group shows :-
 (1) Co-dominance
 (2) Complete dominance
 (3) Mixed inheritance
 (4) Composite inheritance
BPV099
91. A child is blood group is 'O'. His parents blood group cannot be :-
 (1) B and O (2) A and O
 (3) AB (4) A and B
BPV101

- 92.** If one parent has blood group A and the other parent has blood group B. The offsprings have which blood group :-
 (1) AB only (2) O only
 (3) B only (4) A, B, AB, O
BPV102
- 93.** A man of A blood group marries a woman of AB blood group. Which type of progeny would indicate that man is heterozygous A
 (1) AB (2) A (3) O (4) B
BPV104
- 94.** A child of O blood group, has B-blood group father, the genotype of father would be :-
 (1) $I^O I^O$ (2) $I^B I^B$ (3) $I^A I^B$ (4) $I^B I^O$
BPV105
- 95.** When a red flowered plant was cross pollinated by white flowered one and the offspring were self pollinated to obtain a phenotypic ratio of 1:2:1, it has to be a case of:
 (1) Incomplete dominance
 (2) Dominance
 (3) Recessive epistasis
 (4) Pleiotropic effect of genes
BPV106
- 96.** A gene that shows its effect on more than one character is :-
 (1) Polygene
 (2) Pleotropic gene
 (3) Multifactor gene
 (4) Multiple gene
BPV108
- 97.** In multiple allele system a gamete possesses:-
 (1) Two alleles (2) Three alleles
 (3) One allele (4) Several alleles
BPV109
- 98.** Blood grouping in humans is controlled by:-
 (1) 4 alleles in which I^A is dominant
 (2) 3 alleles in which I^A and I^B are dominant
 (3) 2 alleles in which none is dominant
 (4) 3 alleles in which I^A is recessive
BPV110
- 99.** Multiple alleles are present :-
 (1) In different sex chromosomes
 (2) At different loci on chromosome
 (3) At the same locus on homologous chromosomes
 (4) At the non-homologous chromosomes
BPV111
- 100.** Sickle cell anaemia induces due to :-
 (1) Change of Amino Acid in α -chain of Haemoglobin
 (2) Change of Amino Acid in β -chain of Haemoglobin
 (3) Change of Amino Acid in both α and β -chain of Haemoglobin
 (4) Change of Amino acid either α or β -chain of Haemoglobin
BPV113
- 101.** What would be the colour of flower in F_1 progeny as a result of cross between homozygous red and homozygous white flowered Snapdragon ?
 (1) Red (2) White
 (3) Red and White (4) Pink
BPV114
- 102.** Incomplete dominance is found in :-
 (1) *Pisum sativum*
 (2) *Antirrhinum majus*
 (3) Both *Pisum sativum* and *Antirrhinum majus*
 (4) None of these
BPV115

103. In *Mirabilis* red (RR) and white (rr) flowered plant produces pink (Rr) flower. A plant with pink flowered plant is crossed with a plant with white flower the expected phenotypic ratio is :-

- (1) red : pink : white (1 : 2 : 1)
- (2) pink : white (1 : 1)
- (3) red : pink (1 : 1)
- (4) red : white (3 : 1)

BPV116

104. A child with mother of 'A' blood group and father of 'AB' blood group will be :-

- (1) O
- (2) A
- (3) A and O
- (4) O and B

BPV117

105. The possible blood groups of children born to parents having A and AB groups are :-

- (1) O, A
- (2) A, B, AB
- (3) O, A, B
- (4) O, A, B, AB

BPV119

106. A man with blood group B marries a female with blood group A and their first child is having blood group B. What is the genotype of child :-

- (1) $I^A I^B$
- (2) $I^A I^O$
- (3) $I^B I^O$
- (4) $I^B I^B$

BPV120

107. A child with mother of blood group A and father of blood group AB, will not have which of the following blood group :-

- (1) A
- (2) B
- (3) AB
- (4) O

BPV121

108. If mother has blood group B, father has A group, the offspring will be of :-

- (1) A
- (2) O
- (3) AB
- (4) any of the above

BPV122

109. Sickle cell anaemia is the result of _____ mutation in the haemoglobin gene :-

- (1) frame shift
- (2) deletion
- (3) point
- (4) none of the above

BPV124

110. When both alleles of a pair are fully expressed in a heterozygote, they are called

- (1) Lethal
- (2) Co-dominants
- (3) Semi-dominants
- (4) Recessive allele

BPV125

111. In the inheritance of flower colour in dog flower plant, the F_1 had a phenotype that :-

- (1) resembles both of the parents
- (2) did not resembles either of the two parents
- (3) resembles with only one parent
- (4) Both (1) and (3)

BPV126

112. The three different alleles of human ABO blood types will produce how many genotypes & phenotypes, respectively :-

- (1) 4 & 6
- (2) 6 & 4
- (3) 6 & 6
- (4) 4 & 4

BPV127

113. Which of the following material is good to understand incomplete dominance :-

- (1) Sweet Pea
- (2) Cattle
- (3) Snapdragon
- (4) Kernel colour in wheat

BPV129

114. Find out the correct match :-

- (1) F_1 resembled either of the two parents — Dominance
- (2) F_1 resembled in between — Incomplete dominance
- (3) F_1 resembled both parents — Co-dominance
- (4) All are correct

BPV130

115. Which of the following condition is true for codominance :-

- (1) Phenotype of F_1 resembled either of the two parents
- (2) Phenotype of F_1 did not resemble either of two parents
- (3) Phenotype of F_1 resembles both parents
- (4) None of these

BPV131

116. Which of the following is a good example of multiple allele :-

- (1) ABO blood groups
- (2) Size of starch grain in pea
- (3) Shape of seed
- (4) Flower colour in pea

BPV132

117. In sickle cell anaemia :-

- (1) The mutant haemoglobin molecule undergoes polymerisation under low oxygen tension causing the change in the shape of RBC
- (2) Substitution of Glutamic acid by valine at the sixth position of the α -chain of haemoglobin
- (3) The mutant haemoglobin undergoes polymerization under high oxygen tension causing the change in shape of RBC
- (4) α -globin chain is modified

BPV133

118. In a cross between true breeding red flowered (RR) and true breeding white flowered (rr), snapdragon plant, the F_1 (Rr) was pink. When the F_1 was self-pollinated the F_2 resulted in the following ratio 1(RR) red; 2(Rr) pink; 1(rr) white. Above condition can be explained by :-

- (1) True dominance
- (2) Incomplete dominance
- (3) Lethal gene
- (4) Independent assortment

BPV134

119. In case of ABO blood group allele I^A and I^B if present together then :

- (1) Only I^A allele expresses
- (2) Only I^B allele expresses
- (3) Both I^A and I^B alleles express
- (4) None of these

BPV135

POLYGENIC AND CYTOPLASMIC INHERITANCE

120. An example of polygenic inheritance in human beings is :-

- (1) skin colour
- (2) sickle cell anaemia
- (3) colour blindness
- (4) phenylketonuria

BPV136

121. When certain character is inherited only through the female parent, it probably represents the case of :-

- (1) Mendelian nuclear inheritance
- (2) Multiple gene inheritance
- (3) Cytoplasmic inheritance
- (4) Incomplete dominance

BPV138

122. Extranuclear inheritance is a consequence of presence of genes in :-

- (1) Lysosomes and ribosomes
- (2) Mitochondria and chloroplasts
- (3) Endoplasmic reticulum and mitochondria
- (4) Ribosomes and chloroplasts

BPV142

- 123.** Inheritance of skin colour in human beings is an example of :-
 (1) Complementary gene
 (2) Monogenic inheritance
 (3) Polygenic inheritance
 (4) Mendelian inheritance

BPV143

- 124.** Polygenic genes show :-
 (1) Identical phenotypes
 (2) Identical biochemistry
 (3) Different phenotypes
 (4) Identical genotypes

BPV144

- 125.** A dihybrid ratio of 1:4:6:4:1 is obtained instead of 9:3:3:1. This is an example of :-
 (1) Complementary gene
 (2) Supplementary gene
 (3) Polygenic inheritance
 (4) Incomplete dominance

BPV145

- 126.** In polygenic inheritance a trait is controlled by three polygenes. Two individuals which are heterozygous for three alleles, crossed with each other. Such type of cross produces what phenotypic ratio :-
 (1) 1 : 2 : 1
 (2) 9 : 3 : 3 : 1
 (3) 1 : 4 : 6 : 4 : 1
 (4) 1 : 6 : 15 : 20 : 15 : 6 : 1

BPV146

- 127.** In tomato, genotype aabbcc produces 100g tomatoes and AABbCC produces 160g tomatoes. What is contribution of each dominant allele in the production of tomatoes:-
 (1) 10 g (2) 20 g (3) 30 g (4) 40 g

BPV147

- 128.** A polygenic trait is controlled by 3 polygenes A, B and C. In a cross AaBbCc × AaBbCc, the phenotypic ratio of the offsprings was observed as :-
 1 : 6 : x : 20 : x : 6 : 1
 what is the possible value of x ?
 (1) 3 (2) 9 (3) 15 (4) 25

BPV148

- 129.** Gene for cytoplasmic male sterility in plants are generally located in the :-
 (1) chloroplast genome
 (2) mitochondrial genome
 (3) nuclear genome
 (4) cytosol

BPV149

LINKAGE

- 130.** What is the inheritance of colour blindness if both parents having a normal vision but mother has a recessive gene for colour blindness :-

	Son	Daughter
(1)	50%	Nil
(2)	100%	Nil
(3)	Nil	100%
(4)	Nil	Nil

BPV150

- 131.** What would be the nature of children if a colour blind woman marries a normal man:
 (1) Colourblind daughter & normal sons
 (2) Colourblind sons and carrier daughters
 (3) Normal sons & carrier daughters
 (4) Normal sons & Normal daughters

BPV151

- 132.** A colourblind man marries a normal lady whose father was colour blind. If they produce two sons & two daughters, how many of them would suffer?

- (1) Both sons
- (2) Both daughters
- (3) One son & one daughter
- (4) Both sons & both daughters

BPV152

133. A colourblind daughter is born when :-

- (1) Father is colourblind, mother is homozygous normal
- (2) Mother is colourblind, father is normal
- (3) Mother is carrier, father is normal
- (4) Mother is carrier, father is colourblind

BPV153

134. Hypertrichosis is :-

- (1) Holandric character
- (2) X-Linked character
- (3) Diagenic character
- (4) Sex-influenced character

BPV154

135. In which of the following the inheritance takes place only by male :-

- (1) Nuclear
- (2) Cytoplasmic
- (3) Co-dominance
- (4) Holandric inheritance

BPV155

136. Which of the following is not a sex linked characters ?

- (1) Haemophilia (2) Colour blindness
- (3) Hypertrichosis (4) Baldness

BPV156

137. The condition in which only one allele of a pair is present in a diploid organism is known as :-

- (1) Homozygous
- (2) Heterozygous
- (3) Hemizygous
- (4) Incomplete dominance

BPV158

138. Pattern baldness in man is a :-

- (1) Autosomal character
- (2) Sex linked character
- (3) Sex influenced character
- (4) Both (1) and (3)

BPV159

139. A colourblind man marries a daughter of colourblind father, then in the offspring :-

- (1) All sons are colourblind
- (2) All daughters are colourblind
- (3) Half sons are colourblind
- (4) No daughter is colourblind

BPV160

140. A woman with normal vision marries a man with normal vision and gives birth to a colourblind son. Her husband dies and she marries a colourblind man. what is the probability of her children having the abnormality :-

- (1) 50% colourblind sons + 50% colourblind daughters
- (2) All sons colourblind & daughters carrier
- (3) All daughters colourblind & sons normal
- (4) 50% sons colourblind and all daughters normal

BPV161

141. A single recessive gene which can express its effect, should occur on :-

- (1) Any autosome
- (2) Any-chromosome
- (3) X-chromosome of female
- (4) X-chromosome of male

BPV162

142. Sex-linked disorders are generally :-

- (1) Lethal (2) Recessive
- (3) Dominant (4) Not inherited

BPV163

- 143.** In *Drosophila* crossing over occurs in female but not in male. Gene A and B are 10 map unit apart on chromosome. A female *Drosophila* with genotype $\frac{AB}{ab}$ and male *Drosophila* with genotype $\frac{AB}{ab}$. How many types of gametes are produced by female and male *Drosophila*, respectively :-

- (1) 4 types : 2 types
- (2) 2 types : 2 types
- (3) 4 types : 4 types
- (4) 4 types : one types

BPV164

- 144.** In a cross between individuals homozygous for (a, b) and AaBb, 700 out of 1000 individuals were of parental type. Then the distance between a and b is :-

- (1) 70 map unit
- (2) 35 map unit
- (3) 30 map unit
- (4) 15 map unit

BPV165

- 145.** In maize coloured endosperm (C) is dominant over colourless (c) and full endosperm (R) is dominant over shrunken (r). When a dihybrid of F₁-generation was test crossed it produced four phenotypes in the following percentage

Coloured and Full = 45%

Coloured – Shrunken = 5%

Colourless – Full = 4%

Colourless – Shrunken = 46%

From these data what would be distance between the two non allelic genes :-

- (1) 48 unit
- (2) 9 unit
- (3) 4 unit
- (4) 12 unit

BPV166

- 146.** What ratio is expected in offsprings if father is colour blind and mother's father was colour blind :-

- (1) 50% daughters — colour blind
- (2) All the sons — colour blind
- (3) All the daughters — colour blind
- (4) All the sons — normal

BPV167

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

- (1) b, a, c
- (2) a, b, c
- (3) a, c, b
- (4) None

BPV168

- 148.** The linkage map of X-chromosome of fruit fly has 66 map 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:-

- (1) 60%
- (2) > 50%
- (3) ≤ 50%
- (4) 100%

BPV169

- 149.** Mammary glands in female, moustaches and beard in human males are examples of

- (1) Sex linked traits
- (2) Sex limited traits
- (3) Sex differentiating traits
- (4) Sex-determining traits

BPV170

- 150.** When a cluster of genes show linkage behaviour they :-

- (1) Do not show a chromosome map
- (2) Show recombination during meiosis
- (3) Do not show independent assortment
- (4) Induce cell division

BPV171

151. Genetic Map is one that :-

- (1) Establishes sites of the genes on a chromosome
- (2) Establishes the various stages in gene evolution
- (3) Shows the stages during the cell division
- (4) Shows the distribution of various species in a region

BPV172

152. One of the genes present exclusively on the X-chromosome in humans is concerned with:

- (1) Baldness
- (2) Red green colour blindness.
- (3) Facial hair/Moustaches in males.
- (4) Sickle cell anaemia

BPV173

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

- (1) Expressed in females
- (2) Lethal
- (3) Sub-lethal
- (4) Expressed in males

BPV174

154. Lack of independent assortment of two genes A and B in fruit fly is due to :-

- (1) Crossing over
- (2) Repulsion
- (3) Recombination
- (4) Linkage

BPV175

155. A normal woman, whose father was colour-blind is married to a normal man. The sons would be :-

- (1) All colour-blind
- (2) 75% colour-blind
- (3) 50% colour-blind
- (4) All normal

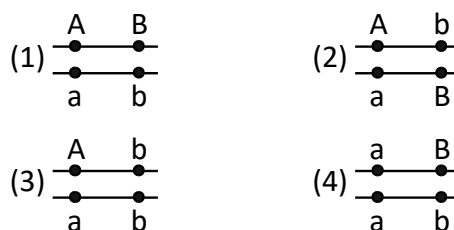
BPV176

156. If father shows normal genotype and mother shows a carrier trait for haemophilia then :-

- (1) All the female children will be carrier
- (2) A male child has 50% chances of active disease
- (3) Female child has probability of 50% to active disease
- (4) All the female children will be colourblind

BPV177

157. Which of the following show linkage group in coupling phase :-



BPV178

158. The longer the chromosome of an organism, the more genetic variability it gets from :-

- (1) Independent assortment
- (2) Linkage
- (3) Crossing over
- (4) Mutation

BPV179

159. 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 :-

- (1) Must have normal colour vision
- (2) May be colour blind or may be normal vision
- (3) Will be partially colour blind since he is hemizygous for the colour-blind mutant allele
- (4) Must be colour blind

BPV180

160. Haemophilia is more commonly seen in human males than in human females because:-

- (1) This disease is due to a Y-linked recessive mutation
- (2) This disease is due to an X-linked recessive mutation
- (3) This disease is due to an X-linked dominant gene
- (4) A greater proportion of girls die in infancy

BPV181

161. If Mendel has chosen to study traits determined by linked genes he would not have discovered :-

- (1) Law of segregation
- (2) Law of dominance
- (3) Law of independent assortment
- (4) Law of unit character

BPV182

162. Which law would have been violated if Mendel had chosen eight characters in garden-pea :-

- (1) Law of dominance
- (2) Law of segregation
- (3) Law of independent assortment
- (4) Law of purity of gametes

BPV183

163. If Mendel might have studies 7 pairs of characters in a plant with 12 chromosomes, instead of 14, then :-

- (1) He could not discover independent assortment
- (2) He might have not discovered linkage
- (3) He might have discovered crossing-over
- (4) He might have not observed dominance

BPV184

164. With increasing age the linkage becomes :-

- (1) Strong
- (2) Weak
- (3) Terminates
- (4) Remains unchanged

BPV185

165. If there were only parental combinations in F_2 of a dihybrid cross then Mendel might have discovered :-

- (1) Independent assortment
- (2) Atavism
- (3) Linkage
- (4) Repulsion

BPV186

166. Linkage was discovered in *Drosophila* by :-

- | | |
|-------------|-------------|
| (1) Bateson | (2) Morgan |
| (3) Muller | (4) Correns |

BPV187

167. A dihybrid plant with incomplete linkage on test cross may produce how many types of plants:-

- | | | | |
|-------|-------|-------|-------|
| (1) 2 | (2) 4 | (3) 8 | (4) 1 |
|-------|-------|-------|-------|

BPV188

168. How many linkage group are there in bacteria *E.coli* ?

- | | | | |
|---------|---------|----------|----------|
| (1) One | (2) Two | (3) Four | (4) None |
|---------|---------|----------|----------|

BPV189

169. If distance between gene on chromosome is more, then gene shows :-

- | | |
|-------------------|--------------------|
| (1) Weak linkage | (2) Strong linkage |
| (3) Less crossing | (4) Both (1) & (3) |

BPV190

170. Linked gene shows :-

- (1) Always non-parental combinations
- (2) Sometimes new combinations
- (3) Always new combinations
- (4) New combinations more

BPV191

171. The number of linkage groups in a cell having 10 pairs of chromosomes are :-

- (1) 5 (2) 10 (3) 15 (4) 20

BPV192

172. The association of parental characters combinations in the offsprings of a dihybrid is excess to non-parental combinations is said to be due to :-

- (1) Co-dominance
(2) Blending inheritance
(3) Linkage
(4) Duplicate genes

BPV193

173. Complete linkage is found in :-

- (1) Birds
(2) Snakes
(3) Female - *Drosophila*
(4) Male - *Drosophila*

BPV194

174. A phenomenon which works opposite to the linkage is :-

- (1) Independent assortment
(2) Crossing-over
(3) Segregation
(4) Mutation

BPV195

175. Cross over value (COV) of gene A and B is 5% while COV of genes B and C is 15% the possible sequence of these genes on chromosome is :-

- (1) A-B-C (2) C-A-B
(3) B-C-A (4) Both (1) & (2)

BPV196

176. TDF gene is a :-

- (1) A gene present on X-chromosome
(2) A segment of RNA
(3) A proteinaceous factor
(4) A gene present on Y-chromosome

BPV197

177. 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 :-

- (1) Sex linked dominant
(2) Sex linked recessive
(3) Sex limited character
(4) Autosomal dominant

BPV198

178. Who postulated the 'Chromosomal theory of Inheritance' ?

- (1) De Vries (2) Mendel
(3) Sutton and Boveri (4) Morgan

BPV199

179. *Drosophila melanogaster* has :-

- (1) 2 pairs of autosomes and 1 pair of sex chromosomes
(2) 3 pairs of autosomes and 3 pairs of sex chromosomes
(3) 1 pairs of autosomes and 3 pairs of sex chromosomes
(4) 3 pairs of autosomes and 1 pairs of sex chromosomes

BPV200

180. Walter Sutton is famous for his contribution to:

- (1) Genetic engineering
(2) Totipotency
(3) Quantitative genetics
(4) Chromosomal theory of inheritance

BPV201

181. If a colour blind man marries a girl who is normal (homozygous) for this character, then genotypically :-

- (1) sons and daughters will be normal
(2) sons will be colour blind, daughters will be normal

(3) sons will be normal, daughters will be carriers

(4) both sons and daughters will be colour blind

BPV202

182. Frequency of crossing over will be relatively more if :-

(1) distance between the two genes is less

(2) distance between the two genes is more

(3) linked genes are more

(4) Both (2) & (3)

BPV203

183. Presence of recombinants is due to :-

(1) crossing over

(2) linkage

(3) lack of independent assortment

(4) all of the above

BPV204

184. Morgan coined the term _____ to describe the physical association of genes on a chromosome & the term _____ to describe the generation of non-parental gene combinations :-

(1) Recombination; Linkage

(2) Recombination; Non-recombination

(3) Linkage; Non-recombination

(4) Linkage; Recombination

BPV205

185. Experimental verification of the chromosomal theory of inheritance done by Thomas Hunt Morgan and his colleagues they worked with :-

(1) Pea plant

(2) Sweet pea plant

(3) Snapdragon

(4) *Drosophila*

BPV206

186. Which is incorrect for *Drosophila melanogaster* ?

(1) They could be grown on simple synthetic medium

(2) Single mating could produce a large number of progeny

(3) They complete their life cycle in about 7 weeks

(4) There was a clear differentiation of the sexes.

BPV207

187. Morgan and his group found that when genes were grouped on the same chromosome, some genes were very tightly linked and showed :-

(1) Very low recombination

(2) Higher recombination

(3) No recombination

(4) 100% parental combination

BPV208

188. Which statement is not true for *Drosophila melanogaster* :-

(1) They complete their life cycle about two weeks.

(2) Single mating produce large number of progeny flies.

(3) It has few hereditary variations that can be seen with high power microscope.

(4) It has clear differentiation of the sex.

BPV209

189. The experimental verification of the chromosomal theory of inheritance was done by :-

(1) Boveri

(2) Sutton

(3) T.H. Morgan

(4) Bateson

BPV210

SEX DETERMINATION

190. How the sex of offsprings determined in humans :-

- (1) Sex chromosome of mother
- (2) Size of ovum
- (3) Size of sperm
- (4) Sex chromosome of father

BPV211

191. Which of the following possess homo-gametic male :-

- (1) Plants
- (2) Man
- (3) Insect
- (4) Birds

BPV212

192. Which chromosome set is found in male grasshopper :-

- (1) 2A + XY
- (2) 2A + XO
- (3) 2A + YY
- (4) 2A + XX

BPV213

193. In male grass hoppers and moths there are two pairs of autosomes and :-

- (1) X only
- (2) X and Y
- (3) Y only
- (4) none of these

BPV220

194. Which of the following symbols are used for representing sex chromosome of birds :-

- (1) ZZ – ZW
- (2) XX – XY
- (3) XO – XX
- (4) ZZ – WW

BPV221

195. In which organism female is homogametic and also has one chromosome more than male?

- (1) Birds
- (2) *Drosophila*
- (3) Chicks
- (4) Grasshopper

BPV227

196. Which of the following is responsible for sex determination in chicks fowls :-

- (1) Sperm
- (2) Egg
- (3) Somatic cell
- (4) Every cell of body

BPV229

197. In which of the following sex is determined by female individual :-

- (1) Human
- (2) *Drosophila*
- (3) Birds
- (4) Grasshopper

BPV230

198. Male heterogamy found in case of :-

- (1) XO type male in Grasshopper
- (2) XY type male in human
- (3) ZW male in birds
- (4) Both (1) and (2)

BPV231

HUMAN GENETICS

199. If a normal woman marries an albino man and their offsprings are half albino, half normal the woman is :-

- (1) Homozygous normal
- (2) Heterozygous normal
- (3) Homozygous recessive
- (4) Homozygous dominant

BPV233

200. Which is a dominant trait :-

- (1) Colour blindness
- (2) Albinism
- (3) Haemophilia
- (4) Rh factor

BPV234

201. Parents are carrier for albinism. What will be the first three children :-

- (1) Some normal, heterozygous & albino
- (2) All normal
- (3) All heterozygous albino
- (4) No normal

BPV235

202. If a cross is made between two individuals each having genotype Bb, two offsprings are obtained. Out of these first has dominant trait. What is the probability that the second offspring will exhibit recessive trait ?

- (1) $\frac{1}{4}$ (2) 100 (3) Zero (4) $\frac{3}{4}$

BPV236

203. A family has five girls and no son, the probability of the occurrence of son as 6th child is :-

- (1) $\frac{1}{2}$ (2) $\frac{1}{5}$
(3) 1 (4) No chance

BPV237

204. A tobacco plant heterozygous for albinism is self-pollinated and 1200 seeds are subsequently germinated. How many seedlings would have the parental genotype:-

- (1) 900 (2) 600
(3) 1200 (4) 300

BPV238

205. What is the probability of three daughters to a couple in three children :-

- (1) $\frac{1}{4}$ (2) $\frac{1}{8}$ (3) $\frac{1}{16}$ (4) $\frac{3}{8}$

BPV240

206. In human right handedness is dominant over left handedness. What offsprings would be expected from two left handed parents :-

- (1) Only left handed
(2) Only right handed
(3) Left handed & right handed both
(4) Neither left handed nor right handed

BPV241

207. Probability of four sons to a couple is :-

- (1) $\frac{1}{4}$ (2) $\frac{1}{8}$
(3) $\frac{1}{16}$ (4) $\frac{1}{32}$

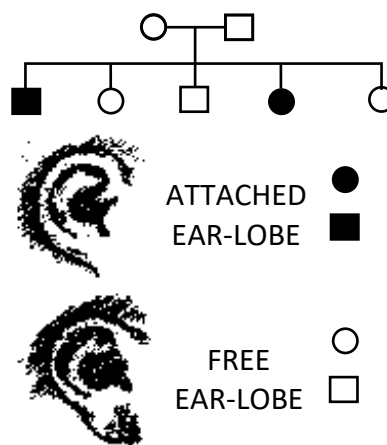
BPV242

208. 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 :-

- (1) $\frac{1}{4}$ (2) $\frac{1}{8}$
(3) $\frac{1}{32}$ (4) $\frac{1}{16}$

BPV243

209. Given below is a pedigree chart of a family with five children. It shows the inheritance of attached ear-lobes as opposed to the free ones. The squares represent the male individuals and circles the female individuals

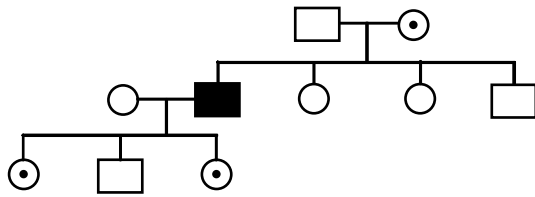


Which one of the following conclusions drawn is correct :-

- (1) The parents are homozygous recessive
(2) The trait is Y-linked
(3) The parents are homozygous dominant
(4) The parents are heterozygous

BPV244

210. Predict from the following chart :-



- (1) Character is dominant and carried by X chromosome
- (2) Character is carried by Y chromosome
- (3) Character is sex linked recessive
- (4) Character is autosomal recessive

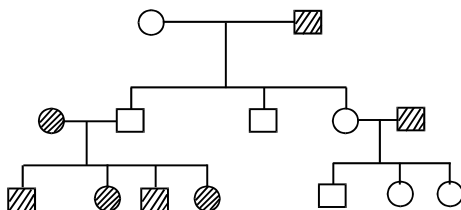
BPV247

211. In pedigree analysis symbol $\odot$ is used for :-

- (1) Heterozygous for autosomal recessive
- (2) Affected individuals
- (3) Death
- (4) Carrier for sex linked recessive

BPV248

212. Study the given pedigree carefully, the trait indicated is :-



$\square$: Normal male

▤ : Affected male

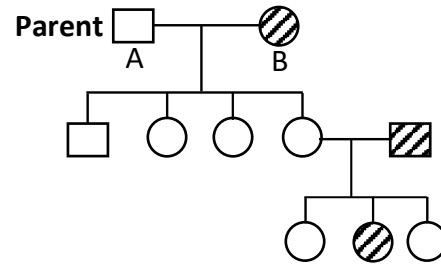
$\circ$: Normal female

⦿ : Affected female

- (1) Autosomal recessive
- (2) X-linked recessive
- (3) Maternal inheritance
- (4) Paternal inheritance

BPV249

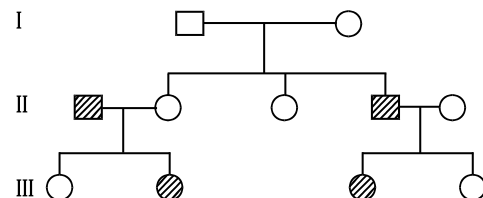
213. Given pedigree shows inheritance of autosomal recessive gene. What is the genotype of given parents :-



- (1) AA, aa
- (2) aa, AA
- (3) aa, Aa
- (4) Aa, Aa

BPV251

214. A pedigree is shown below for a disease that is autosomal recessive. The genetic makeup of the first generation :-



- (1) AA, aa
- (2) Aa, Aa
- (3) Aa, aa
- (4) aa, aa

BPV252

215. A normal woman whose father was albino, marries an albino man, what proportion of normal and albino are expected among their offsprings :-

- (1) All normal
- (2) 2 normal : 1 Albino
- (3) All albino
- (4) 1 normal : 1 Albino

BPV256

216. Albinism is determined by a recessive gene in man. The presence of albinism in 50% children born to a couple proves that :-

- (1) Both parents are heterozygous for albinism
- (2) Father is homozygous normal and mother is heterozygous
- (3) Father is homozygous for albinism but mother is heterozygous
- (4) Both are homozygous

BPV257

217. Family has 9 girls, Probability of son at 10th birth is :-

- (1) 50% (2) 100%
(3) 25% (4) 75%

BPV258

218. Polydactyly in man is due to :-

- (1) autosomal dominant gene
(2) autosomal recessive gene
(3) sex - linked dominant gene
(4) sex - linked recessive gene

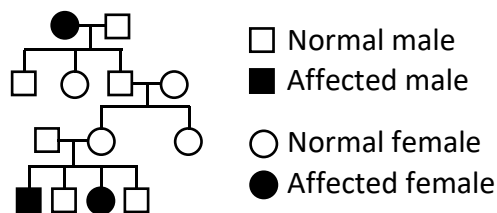
BPV259

219. Blue eye colour in human is recessive to brown eye colour. The expected children of a marriage between a blue eyed woman and a brown eyed man who had a blue eyed mother will be :-

- (1) All black eyed
(2) All blue eyed
(3) All brown eyed
(4) One blue eyed and one brown eyed

BPV260

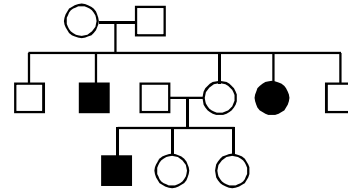
220. Study the pedigree given below and assign the type of inheritance of the trait :-



- (1) X-linked recessive
(2) Y-linked
(3) autosomal recessive
(4) autosomal dominant

BPV262

221. Given below is the pedigree of sickle cell anaemia, in a family :



In this the RBC of both parents will be :

- (1) Normal
(2) Sickle shaped
(3) Both normal & sickle shaped
(4) Cannot be determined

BPV263

222 Which of the following symbol is used for mating between relatives (Consanguineous mating)?

- (1) (2)
(3) (4)

BPV264

EXERCISE-I (Conceptual Questions)

ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	1	3	2	1	4	2	1	4	4	3	3	3	3	3	1
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	1	4	3	4	4	2	2	4	1	2	4	4	3	3	1
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	3	2	4	2	1	2	4	1	3	1	2	1	1	4	1
Question	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Answer	2	3	2	3	2	1	2	2	2	1	1	3	3	3	1
Question	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Answer	1	3	2	2	3	3	2	4	1	2	3	1	3	1	2
Question	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Answer	1	2	1	4	4	1	4	3	4	2	3	4	2	2	1
Question	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
Answer	3	4	4	4	1	2	3	2	3	2	4	3	2	2	2
Question	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Answer	3	4	4	3	2	2	2	3	4	3	1	1	2	3	1
Question	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135
Answer	3	2	3	3	3	4	1	3	2	1	2	3	4	1	4
Question	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
Answer	4	3	4	3	1	4	2	1	3	2	1	1	3	2	3
Question	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165
Answer	1	2	4	4	3	2	1	3	2	2	3	3	1	1	3
Question	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Answer	2	2	1	1	2	2	3	4	2	4	4	1	3	4	4
Question	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195
Answer	3	2	1	4	4	3	1	3	3	4	4	2	1	1	4
Question	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210
Answer	2	3	4	2	4	1	1	1	2	2	1	3	2	4	3
Question	211	212	213	214	215	216	217	218	219	220	221	222			
Answer	4	3	1	2	4	3	1	1	4	3	3	3			

Exercise - II (Previous Year Questions)

AIPMT/NEET

AIPMT 2014

1. 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?

(1) 25% (2) 0% (3) 50% (4) 75%

BPV301

2. A human female with Turner's syndrome :-

(1) has 45 chromosomes with XO.
(2) has one additional X chromosome.
(3) exhibits male characters.
(4) is able to produce children with normal husband.

BPV303

AIPMT 2015

3. A man with blood group 'A' marries a woman with blood group 'B'. What are all the possible blood groups of their offspring

(1) A,B and AB only (2) A,B,AB and O
(3) O only (4) A and B only

BPV304

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

(1) Six (2) Eight
(3) Seven (4) Five

BPV305

5. Multiple alleles are present :-

(1) At different loci on the same chromosome
(2) At the same locus of the chromosome
(3) On non-sister chromatids
(4) On different chromosomes

BPV306

6. Alleles are :-

(1) true breeding homozygotes
(2) different molecular forms of a gene
(3) heterozygotes
(4) different phenotype

BPV307

7. Which is the most common mechanism of genetic variation in the population of sexually reproducing organism?

(1) Chromosomal aberrations
(2) Genetic drift
(3) Recombination
(4) Transduction

BPV309

RE-AIPMT 2015

8. 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 (son's son) being colour-blind?

(1) 0.25 (2) 0.5
(3) 1 (4) Nil

BPV310

9. The term "linkage" was coined by :

(1) W. Sutton (2) T.H. Morgan
(3) T. Boveri (4) G. Mendel

BPV311

10. A pleiotropic gene :

(1) controls multiple traits in an individual
(2) is expressed only in primitive plants
(3) is a gene evolved during Pliocene
(4) controls a trait only in combination with another gene

BPV312

11. In his classic experiments on pea plants, Mendel did not use :

- (1) Flower position
- (2) Seed colour
- (3) Pod length
- (4) Seed shape

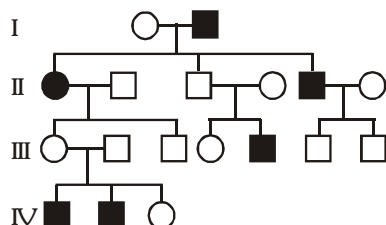
BPV313

12. A gene showing codominance has :

- (1) both alleles independently expressed in the heterozygote
- (2) one allele dominant on the other
- (3) alleles tightly linked on the same chromosome
- (4) alleles that are recessive to each other

BPV314

13. In the following human pedigree, the filled symbols represent the affected individuals. Identify the type of given pedigree :-



- (1) X-linked dominant
- (2) Autosomal dominant
- (3) X-linked recessive
- (4) Autosomal recessive

BPV315

NEET-I 2016

14. Which of the following most appropriately describes haemophilia ?

- (1) Recessive gene disorder
- (2) X - linked recessive gene disorder
- (3) Chromosomal disorder
- (4) Dominant gene disorder

BPV316

15. 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

- (1) 1 : 2 : 1 :: Tall homozygous : Tall heterozygous : Dwarf
- (2) 1 : 2 : 1 :: Tall heterozygous : Tall homozygous : Dwarf
- (3) 3 : 1 :: Tall : Dwarf
- (4) 3 : 1 :: Dwarf : Tall

BPV317

16. Match the terms in Column-I with their description in Column-II and choose the correct option :

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

- (1) (a)–(ii), (b)–(i), (c)–(iv), (d)–(iii)
- (2) (a)–(ii), (b)–(iii), (c)–(iv), (d)–(i)
- (3) (a)–(iv), (b)–(i), (c)–(ii), (d)–(iii)
- (4) (a)–(iv), (b)–(iii), (c)–(i), (d)–(ii)

BPV318

17. Pick out the correct statements :

- (a) Haemophilia is a sex-linked recessive disease
- (b) Down's syndrome is due to aneuploidy
- (c) Phenylketonuria is an autosomal recessive gene disorder.

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

- (1) (a) and (d) are correct
- (2) (b) and (d) are correct
- (3) (a), (c) and (d) are correct
- (4) (a), (b) and (c) are correct

BPV319

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

- (1) The two genes are located on two different chromosomes.
- (2) Chromosomes failed to separate during meiosis.
- (3) The two genes are linked and present on the same chromosome.
- (4) Both of the characters are controlled by more than one gene.

BPV320

NEET-II 2016

19. A true breeding plant is :

- (1) near homozygous and produces offspring of its own kind
- (2) always homozygous recessive in its genetic constitution
- (3) one that is able to breed on its own
- (4) produced due to cross-pollination among unrelated plants

BPV321

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

- (1) 0.75
- (2) 1
- (3) 0
- (4) 0.5

BPV322

NEET (UG) 2017

21. Thalassaemia and sickle cell anaemia are caused due to a problem in globin molecule synthesis. Select the correct statement :-

- (1) Both are due to a quantitative defect in globin chain synthesis
- (2) Thalassaemia is due to less synthesis of globin molecules
- (3) Sickle cell anaemia is due to a quantitative problem of globin molecules
- (4) Both are due to a qualitative defect in globin chain synthesis

BPV325

22. The genotypes of a husband and Wife are $I^A I^B$ & $I^A i$. Among the blood types of their children, how many different genotypes and phenotypes are possible?

- (1) 3 genotypes ; 4 phenotypes
- (2) 4 genotypes ; 3 phenotypes
- (3) 4 genotypes ; 4 phenotypes
- (4) 3 genotypes ; 3 phenotypes

BPV326

23. Which one from those given below is the period for Mendel's hybridization experiments ?

- (1) 1840 - 1850
- (2) 1857 - 1869
- (3) 1870 - 1877
- (4) 1856 - 1863

BPV327

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

- (1) Klinefelter's Syndrome
- (2) Turner's Syndrome
- (3) Sickle Cell Anaemia
- (4) Down's Syndrome

BPV328

NEET(UG) 2018

25. Select the **correct** statement :-
- (1) Franklin Stahl coined the term "linkage".
 - (2) Punnett square was developed by a British scientist.
 - (3) Spliceosomes take part in translation.
 - (4) Transduction was discovered by S. Altman.

BPV329

26. Which of the following pairs is **wrongly** matched ?

- (1) Starch synthesis in pea : Multiple alleles
- (2) ABO blood grouping : Co-dominance
- (3) XO type sex determination : Grasshopper
- (4) T.H. Morgan : Linkage

BPV330

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

- a. Dominance
- b. Co-dominance
- c. Multiple allele
- d. Incomplete dominance
- e. Polygenic inheritance

- (1) b, c and e (2) a, b and c
- (3) b, d and e (4) a, c and e

BPV331

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

- (1) Only daughters
- (2) Only sons
- (3) Only grandchildren
- (4) Both sons & daughters

BPV332

NEET(UG) 2019

29. What map unit (Centimorgan) is adopted in the construction of genetic maps?

- (1) A unit of distance between two expressed genes, representing 10% cross over
- (2) A unit of distance between two expressed genes, representing 100% cross over
- (3) A unit of distance between genes on chromosomes, representing 1% cross over
- (4) A unit of distance between genes on chromosomes, representing 50% cross over

BPV333

30. The frequency of recombination between gene pairs on the same chromosome as a measure of the distance between genes was explained by :-

- (1) T.H. Morgan
- (2) Gregor J. Mendel
- (3) Alfred Sturtevant
- (4) Sutton & Boveri

BPV335

31. In *Antirrhinum* (Snapdragon), a red flower was crossed with a white flower and in F_1 generation, pink flowers were obtained. When pink flowers were selfed, the F_2 generation showed white, red and pink flowers. Choose the incorrect statement from the following :-

- (1) This experiment does not follow the Principle of Dominance
- (2) Pink colour in F_1 is due to incomplete dominance.
- (3) Ratio of F_2 is $\frac{1}{4}$ (Red) : $\frac{2}{4}$ (Pink) : $\frac{1}{4}$ (White)
- (4) Law of Segregation does not apply in this experiment.

BPV336

32. Select the **incorrect** statement.
- (1) Male fruit fly is heterogametic.
 - (2) In male grasshoppers, 50% of sperms have no sex-chromosome.
 - (3) In domesticated fowls sex of progeny depends on the type of sperm rather than egg.
 - (4) Human males have one of their sex-chromosome much shorter than the other.

BPV337

NEET (UG) 2019 (Odisha)

33. Match the items of column I with column II

Column-I	Column-II
(a) XX-XO method of sex determination	(i) Turner's syndrome
(b) XX-XY method of sex determination	(ii) Female heterogametic
(c) Karyotype-45	(iii) Grasshopper
(d) ZW-ZZ method of sex determination	(iv) Female homogametic

Select the correct option from the following

- (1) a-ii, b-iv, c-i, d-iii
- (2) a-i, b-iv, c-ii, d-iii
- (3) a-iii, b-iv, c-i, d-ii
- (4) a-iv, b-ii, c-i, d-iii

BPV338

34. In a marriage between male with blood group A and female with blood group B, the progeny had either blood group AB or B. What could be the possible genotype of parents ?
- (1) $I^A i$ (Male) : $I^B I^B$ (Female)
 - (2) $I^A I^A$ (Male) : $I^B I^B$ (Female)
 - (3) $I^A I^A$ (Male) : $I^B i$ (Female)
 - (4) $I^A i$ (Male) : $I^B i$ (Female)

BPV339

35. The production of gametes by the parents, the formation of zygotes, the F_1 and F_2 plants, can be understood using :-
- (1) Pie diagram
 - (2) A pyramid diagram
 - (3) Punnet square
 - (4) Venn diagram

BPV340

36. In which genetic condition, each cell in the affected person has three sex chromosomes XXY ?
- (1) Thalassemia
 - (2) Klinefelter's Syndrome
 - (3) Phenylketonuria
 - (4) Turner's Syndrome

BPV341

NEET (UG) 2020

37. Experimental verification of the chromosomal theory of inheritance was done by-
- (1) Morgan
 - (2) Mendel
 - (3) Sutton
 - (4) Boveri
38. Select the **correct** match :-
- (1) Thalassemia - X linked
 - (2) Haemophilia - Y linked
 - (3) Phenylketonuria - Autosomal dominant trait
 - (4) Sickle cell anaemia - Autosomal recessive trait, chromosome-11

BPV342

39. Identify the wrong statement with reference to the gene 'I' that controls ABO blood groups:
- (1) Allele 'i' does not produce any sugar.
 - (2) The gene (I) has three alleles.
 - (3) A person will have only two of the three alleles.
 - (4) When I^A and I^B are present together, they express same type of sugar.

BPV344

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

(1) 8 (2) 4 (3) 2 (4) 14

BPV345

NEET (UG) 2020 (COVID-19)

41. The number of contrasting characters studied by Mendel for his experiments was

(1) 14 (2) 4 (3) 2 (4) 7

BPV347

42. The best example for pleiotropy is :-

(1) Skin colour (2) Phenylketonuria
(3) Colour Blindness (4) ABO Blood group

BPV348

43. Chromosomal theory of inheritance was proposed by :

(1) Sutton and Boveri
(2) Bateson and Punnett
(3) T. H. Morgan
(4) Watson and Crick

BPV349

NEET (UG) 2021

44. The production of gametes by the parents, formation of zygotes, the F_1 and F_2 plants, can be understood from a diagram called :

(1) Bullet square (2) Punch square
(3) Punnett square (4) Net square

BPV350

45. In a cross between a male and female, both heterozygous for sickle cell anaemia gene, what percentage of the progeny will be diseased ?

(1) 50% (2) 75%
(3) 25% (4) 100%

BPV351

NEET (UG) 2021 (Paper-2)

46. Whether a tall plant from F_1 or F_2 has TT or Tt composition, it can be predicted by -

(1) Monohybrid cross (2) Out cross
(3) Dihybrid cross (4) Test cross

BPV465

47. Which of the following is incorrect combination?

(1) XO-type sex determination—Grasshopper
(2) XY-type sex determination – *Drosophila*
(3) ZW-type sex determination – *Pava*
(4) X-body – Morgan

BPV466

48. Which of the following conditions of the zygotic cell would lead to the birth of a normal human male child?

(1) Two X-chromosomes
(2) Only one Y-chromosomes
(3) Only one X-chromosomes
(4) One X and Y-chromosomes

BPV467

49. Match the columns I and II, and choose the correct combination from the options given.

Column-I

Column-II

- | | |
|-----------------------------------|-----------------------------|
| (a) Inborn error of metabolism | (i) Haemophilia |
| (b) Down's syndrome | (ii) Rudimentary ovaries |
| (c) Turner's syndrome | (iii) Phenylketonuria |
| (d) Sex linked recessive disorder | (iv) Partially opened mouth |
| (1) a-ii, b-iv, c-i, d-iii | |
| (2) a-iii, b-iv, c-ii, d-i | |
| (3) a-i, b-iv, c-iii, d-ii | |
| (4) a-ii, b-iii, c-iv, d-i | |

BPV468

50. In artificial hybridisation, which of the following phenomenon is not required for the female parent?
- (1) Emasculation
 - (2) Bagging
 - (3) Dusting of pollen grains (pollination)
 - (4) Rebagging

BPV469

NEET-UG 2022

51. Given below are two statements:

Statement I: Mendel studied seven pairs of contrasting traits in pea plants and proposed the Laws of Inheritance

Statement II: Seven characters examined by Mendel in his experiment on pea plants were seed shape and colour, flower colour, pod shape and colour, flower position and stem height

In the light of the above statements, choose the **correct** answer from the options given below :-

- (1) Both **Statement-I** and **Statement-II** are incorrect
- (2) **Statement-I** is correct but **Statement-II** is incorrect
- (3) **Statement-I** is incorrect but **Statement-II** is correct
- (4) Both **Statement-I** and **Statement-II** are correct

BPV352

52. XO type of sex determination can be found in:-

- | | |
|-------------|-----------------------|
| (1) Birds | (2) Grasshoppers |
| (3) Monkeys | (4) <i>Drosophila</i> |

BPV353

53. Given below are two statements: one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A): Mendel's law of Independent assortment does not hold good for the genes that are located closely on the same chromosome.

Reason (R): Closely located genes assort independently.

In the light of the above statements, choose the **correct answer** from the options given below:

- (1) Both **(A)** and **(R)** are correct but **(R)** is not the correct explanation of **(A)**
- (2) **(A)** is correct but **(R)** is not correct
- (3) **(A)** is not correct but **(R)** is correct
- (4) Both **(A)** and **(R)** are correct and **(R)** is the correct explanation of **(A)**

BPV354

54. Which of the following occurs due to the presence of autosome linked dominant trait

- (1) Myotonic dystrophy
- (2) Haemophilia
- (3) Thalassemia
- (4) Sickle cell anaemia

BPV355

55. The recombination frequency between the genes a & c is 5%, b & c is 15%, b & d is 9%, a & b is 20%, c & d is 24% and a & d is 29%. What will be the sequence of these genes on a linear chromosome ?

- | | |
|----------------|----------------|
| (1) d, b, a, c | (2) a, b, c, d |
| (3) a, c, b, d | (4) a, d, b, c |

BPV356

56. If a colour blind female marries a man whose mother was also colour blind, what are the chances of her progeny having colour blindness ?

(1) 50% (2) 75% (3) 100% (4) 25%

BPV357

NEET-UG 2022 (OVERSEAS)

57. Match the List-I and List-II.

List-I		List-II	
(a)	Haemophilia	(i)	Inborn error of metabolism which lacks an enzyme that converts phenylalanine into tyrosine.
(b)	Down's Syndrome	(ii)	Sex-linked recessive disorder, defect in blood coagulation.
(c)	Phenylketonuria	(iii)	Presence of additional copy of X-chromosome (44+XXY)
(d)	Klinefelter's Syndrome	(iv)	Additional copy of chromosome number 21

Choose the correct combination from the options given.

- (1) a-iv, b-ii, c-i, d-iii
 (2) a-ii, b-iii, c-i, d-iv
 (3) a-ii, b-i, c-iii, d-iv
 (4) a-ii, b-iv, c-i, d-iii

BPV470

58. Select the **correct** statements with respect to pleiotropism.

- (a) A gene is said to be pleiotropic if it affects more than one trait
 (b) Phenylketonuria is an example of pleiotropy.
 (c) a condition where one gene has several alleles is referred to as pleiotropism.

- (d) A trait is said to be pleiotropic if several genes control it.

Choose the **correct** answer from the options given below :

- (1) (a) and (d) only
 (2) (a), (b) and (c) only
 (3) (b), (c) and (d) only
 (4) (a) and (b) only

BPV471

59. Given below are two statements : One is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A) : A father will never pass the gene for haemophilia to his sons.

Reason (R) : Haemophilia is sex-linked (X-linked) recessive trait.

In the light of the above statements, choose the **correct** answer from the options given below :

- (1) (A) is not correct but (R) is correct.
 (2) Both (A) and (R) are correct and (R) is the correct explanation of (A).
 (3) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
 (4) (A) is correct but (R) is not correct.

BPV472

60. Assuming that fur colour of an animal is dark, range of colour shade and white. A cross is made between a male (AABBCC) with dark fur colour and a female (aabbcc) with white fur colour. What would be the fur colour of F_1 generation?

- (1) Range of colour shade
 (2) All dark colour
 (3) All white colour
 (4) All intermediate colour

BPV473

61. In *Drosophila*, the genes for color of body and color of eyes are situated on _____.
 (1) Autosomes
 (2) Y-chromosome
 (3) X-chromosome
 (4) Both the sex chromosome

BPV474

62. A low frequency recombination indicates that the genes are :
 (1) Located close to each other
 (2) Not linked
 (3) Present on different chromosome
 (4) Located far apart from each other

BPV475

Re-NEET-UG 2022

63. Given below are two statements :-
Statement-I: Sickle cell anaemia and Haemophilia are autosomal dominant traits.
Statement-II: Sickle cell anaemia and Haemophilia are disorders of the blood.
 In the light of the above statements, choose the **correct answer** from the options given below :
 (1) Both **Statement-I** and **Statement-II** are correct
 (2) Both **Statement-I** and **Statement-II** are incorrect
 (3) **Statement-I** is correct but **Statement-II** is incorrect
 (4) **Statement-I** is incorrect but **Statement-II** is correct

BPV358

64. The chromosomal theory of inheritance was proposed by :-
 (1) Thomas Morgan (2) Sutton and Boveri
 (3) Gregor Mendel (4) Robert Brown

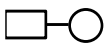
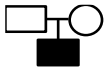
BPV359

65. If a female individual is with small round head, furrowed tongue, partially open mouth and broad palm with characteristic palm crease. Also the physical, psychomotor and mental development is retarded. The karyotype analysis of such an individual will show :-
 (1) 47 chromosomes with XXY sex chromosomes
 (2) 45 chromosomes with XO sex chromosomes
 (3) 47 chromosomes with XYY sex chromosomes
 (4) Trisomy of chromosome 21

BPV360

66. What is the expected percentage of F_2 progeny with yellow and inflated pod in dihybrid cross experiment involving pea plants with green coloured, inflated pod and yellow coloured constricted pod ?
 (1) 100% (2) 56.25%
 (3) 18.75 % (4) 9%

BPV361

67. Select the **incorrect** match regarding the symbols used in Pedigree analysis :-
 (1)  — Sex unspecified
 (2)  — Affected individual
 (3)  — Consanguineous mating
 (4)  — Parent with male child affected with disease

BPV362

68. A normal girl, whose mother is haemophilic marries a male with no ancestral history of haemophilia. What will be the possible phenotypes of the offsprings ?
 (a) Haemophilic son and haemophilic daughter.
 (b) Haemophilic son and carrier daughter.
 (c) Normal daughter and normal son.
 (d) Normal son and haemophilic daughter.

Choose the most appropriate answer from the options given below :

- (1) (a) and (b) only (2) (b) and (c) only
(3) (a) and (d) only (4) (b) and (d) only

BPV363

NEET-UG 2023

69. Frequency of recombination between gene pairs on same chromosome as a measure of the distance between genes to map their position on chromosome, was used for the first time by

- (1) Sutton and Boveri
(2) Alfred Sturtevant
(3) Hanking
(4) Thomas Hunt Morgan

BPV476

70. The phenomenon of pleiotropism refers to
- (1) presence of two alleles, each of the two genes controlling a single trait.
 - (2) a single gene affecting multiple phenotypic expression.
 - (3) more than two genes affecting a single character.
 - (4) presence of several alleles of a single gene controlling a single crossover.

BPV477

71. Which of the following statements are correct about Klinefelter's Syndrome?
- A. This disorder was first described by Langdon Down (1866).
 - B. Such an individual has overall masculine development. However, the feminine development is also expressed.
 - C. The affected individual is short statured.
 - D. Physical, psychomotor and mental development is retarded.
 - E. Such individuals are sterile.

Choose the correct answer from the options given below:

- (1) C and D only (2) B and E only
(3) A and E only (4) A and B only

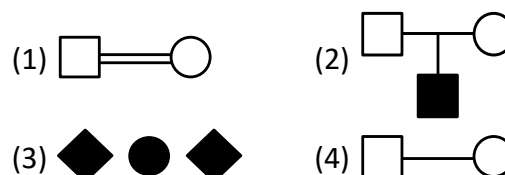
BPV478

72. Broad palm with single palm crease is visible in a person suffering from -

- (1) Turner's syndrome
(2) Klinefelter's syndrome
(3) Thalassemia
(4) Down's syndrome

BPV479

73. Which one of the following symbols represents mating between relatives in human pedigree analysis?



BPV480

NEET-UG 2023 (MANIPUR)

74. Match List-I with List-II.

	List-I (Type of cross)		List-II (Phenotypic ratio)
(A)	Monohybrid Cross	(I)	1 : 1
(B)	Dihybrid Cross	(II)	1 : 2 : 1
(C)	Incomplete dominance	(III)	3 : 1
(D)	Test Cross	(IV)	9 : 3 : 3 : 1

Choose the correct answer from the options given below :-

- (1) (A)-(III), (B)-(IV), (C)-(II), (D)-(I)
(2) (A)-(II), (B)-(IV), (C)-(III), (D)-(I)
(3) (A)-(II), (B)-(III), (C)-(IV), (D)-(I)
(4) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)

BPV481

75. A heterozygous pea plant with violet flowers was crossed with homozygous pea plant with white flower. Violet is dominant over white. Which one of the following represents the expected combinations among 40 progenies formed ?

- (1) 30 produced violet and 10 produced white flowers
- (2) 20 produced violet and 20 produced white flowers
- (3) All 40 produced violet flowers
- (4) All 40 produced white flowers

BPV482

76. In which disorder change of single base pair in the gene for beta globin chain results in change of glutamic acid to valine ?

- (1) Thalassemia
- (2) Sick cell anemia
- (3) Haemophilia
- (4) Phenylketonuria

BPV483

77. A certain plant homozygous for yellow seeds and red flowers was crossed with a plant homozygous for green seeds and white flowers. The F_1 plants had yellow seeds and pink flowers. The F_1 plants were selfed to get F_2 progeny. Assuming independent assortment of the two characters, how many phenotypic categories are expected for these characters in the F_2 generation ?

- (1) 9 (2) 16 (3) 4 (4) 6

BPV484

78. Select the **correct** statement/s with respect to mechanism of sex determination in Grasshopper.

- (A) It is an example of female heterogamety.
- (B) Male produces two different types of gametes either with or without X chromosome.
- (C) Total number of chromosomes (autosomes and sex chromosomes) is same in both males and females.
- (D) All eggs bear an additional X chromosome besides the autosomes.

Choose the **correct** answer from the options given below :

- (1) (B) and (D) only
- (2) (A), (C) and (D) only
- (3) (A) only
- (4) (A) and (C) only

BPV485

NEET-UG 2024

79. A pink flowered Snapdragon plant was crossed with a red flowered Snapdragon plant. What type of phenotype/s is/are expected in the progeny?

- (1) Only red flowered plants.
- (2) Red flowered as well as pink flowered plants.
- (3) Only pink flowered plants.
- (4) Red, Pink as well as white flowered plants.

BPV488

80. In a plant, black seed color (BB/Bb) is dominant over white seed color (bb). In order to find out the genotype of the black seed plant, with which of the following genotype will you cross it?

- (1) BB (2) bb
(3) Bb (4) BB/Bb

BPV489

81. Which one of the following can be explained on the basis of Mendel's Law of Dominance?

- A. Out of one pair of factors one is dominant and the other is recessive.
- B. Alleles do not show any expression and both the characters appear as such in F_2 generation.
- C. Factors occur in pairs in normal diploid plants.
- D. The discrete unit controlling a particular character is called factor.
- E. The expression of only one of the parental characters is found in a monohybrid cross.

Choose the correct answer from the options given below :

- (1) A, B and C only (2) A, C, D and E only
- (3) B, C and D only (4) A, B, C, D and E

BPV490

82. Match List-I with List-II.

List-I		List-II	
A.	Two or more alternative forms of a gene	I.	Back cross
B.	Cross of F_1 progeny with homozygous recessive parent	II.	Ploidy
C.	Cross of F_1 progeny with any of the parents	III.	Allele
D.	Number of chromosome sets in plant	IV.	Test cross

Choose the **correct** answer from the options given below :-

- (1) A-I, B-II, C-III, D-IV
- (2) A-II, B-I, C-III, D-IV
- (3) A-III, B-IV, C-I, D-II
- (4) A-IV, B-III, C-II, D-I

BPV491

83. Match List-I with List-II.

List-I		List-II	
A.	Down's syndrome	I.	11 th chromosome
B.	α -Thalassemia	II.	'X' chromosome
C.	β -Thalassemia	III.	21 st chromosome
D.	Klinefelter's syndrome	IV.	16 th chromosome

Choose the **correct** answer from the options given below :-

- (1) A-I, B-II, C-III, D-IV
- (2) A-II, B-III, C-IV, D-I
- (3) A-III, B-IV, C-I, D-II
- (4) A-IV, B-I, C-II, D-III

BPV492

84. As per ABO blood grouping system, the blood group of father is B^+ , mother is A^+ and child is O^+ . Their respective genotype can be

- A. $I^B i / I^A i$ / ii
- B. $I^B I^B / I^A I^A$ / ii
- C. $I^A I^B / ii$ / $I^B i$
- D. $I^A i / I^B i$ / $I^A i$
- E. $ii^B / ii^A / I^A I^B$

Choose the most appropriate answer from the options given below :

- (1) A only (2) B only
- (3) C & B only (4) D & E only

BPV493

RE-NEET-UG 2024

85. **Statement-I** : When many alleles of a single gene govern a character, it is called polygenic inheritance.

Statement-II : In Polygenic inheritance, the effect of each allele is additive.

In the light of the above statements, choose the **correct** answer from the options given below.

- (1) Statement I is true but Statement II is false
 (2) Statement I is false but Statement II is true
 (3) Both Statement I and Statement II are true
 (4) Both Statement I and Statement II are false

BPV494

86. Match List-I with List-II :

List-I Type of Inheritance		List-II Example	
A.	Incomplete dominance	I.	Blood groups in human
B.	Co-dominance	II.	Flower colour in <i>Antirrhinum</i>
C.	Pleiotropy	III.	Skin colour in human
D.	Polygenic inheritance	IV.	Phenylketonuria

Choose the **correct** answer from the options given below :-

- (1) A-III, B-IV, C-II, D-I
 (2) A-II, B-I, C-IV, D-III
 (3) A-II, B-III, C-I, D-IV
 (4) A-IV, B-I, C-III, D-II

BPV495

87. When a tall pea plant with round seeds was selfed, it produced the progeny of :-

- (a) tall plants with round seeds and
 (b) tall plants with wrinkled seeds

Identify the genotype of the parent plant.

- (1) TtRr (2) TtRR
 (3) TTRR (4) TTRr

BPV496

88. A person with blood group A Rh⁻ can receive the blood transfusion from which of the following types?

- A. B Rh⁻ B. AB Rh⁻
 C. O Rh⁻ D. A Rh⁻
 E. A Rh⁺

Choose the **correct** answer from the options given below :-

- (1) D and E only
 (2) D only
 (3) A and B only
 (4) C and D only

BPV497

89. The mother has A+ blood group, the father has B+ and the child is A+. What can be the possible genotypes of all three, respectively?

- A. I^AI^A | I^Bi | I^Bi
 B. I^AI^A | I^Bi | I^Ai
 C. I^Bi | I^AI^A | I^AI^B
 D. I^AI^A | I^BI^B | I^Ai
 E. I^Ai | I^Bi | I^Ai

Choose the **correct** answer from the options given below :-

- (1) C and D (2) D and A
 (3) A and B (4) B and E

BPV498

EXERCISE-II (Previous Year Questions)

ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	3	1	2	3	2	2	3	4	2	1	3	1	4	2	1
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	2	4	3	1	3	2	2	4	4	2	1	2	4	3	3
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	4	3	3	1	3	2	1	4	4	4	4	2	1	3	3
Question	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Answer	4	4	4	2	1	4	2	2	1	3	3	4	4	2	4
Question	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Answer	3	1	4	2	4	3	3	2	2	2	2	4	1	1	2
Question	76	77	78	79	80	81	82	83	84	85	86	87	88	89	
Answer	2	4	1	2	2	2	3	3	1	2	2	4	4	4	

Exercise - III

Master Your Understanding

(A) NCERT BASED QUESTIONS

- Variations are :-
 (1) Degree by which progeny differs from their parents
 (2) Degree by which progeny is similar to their parents
 (3) Process by which characters are passed on from parent to progeny
 (4) True breeding lines

BPV364

- Mendel found that the F_1 always resembled either one of the parents and that the trait of the other parent was not seen in them. This is due to :-
 (1) Segregation
 (2) Dominance
 (3) Partial dominance
 (4) Unit factor

BPV365

- In monohybrid cross the allele do not show any blending and that both the characters are recovered as such in F_2 generation. This statement is explained on the basis of :-
 (1) Dominance
 (2) Segregation
 (3) Independent assortment
 (4) All the above

BPV366

- In monohybrid cross proportion of 3 : 1 explains :-
 (1) Dominance (2) Segregation
 (3) Both (1) and (2) (4) Unit factor

BPV367

- Theoretically, the modified allele could be responsible for the production of :-
 (1) less efficient enzyme
 (2) A non-functional enzyme
 (3) No enzyme at all
 (4) All the above

BPV368

- The modified allele is equivalent to the unmodified allele when it produces :-
 (1) Normal enzyme
 (2) A non-functional enzyme
 (3) No enzyme at all
 (4) Inactive enzyme

BPV369

- Recessive traits are seen due to :-
 (1) Formation of non-functional enzyme
 (2) Enzyme is not produced
 (3) Both (1) and (2)
 (4) Formation of functional enzyme

BPV370

- A diploid organism is heterozygous for 4 loci, how many types of gametes can be produced?
 (1) 8 (2) 16 (3) 2 (4) 32

BPV371

- When a cross is made between tall plant with yellow seed ($TtYy$) and tall plant with green seed ($Tt yy$), what proportion of phenotype in the offspring could be expected to be tall and green :-
 (1) 25% (2) 12.5%
 (3) 37.5% (4) 50%

BPV372

- 10.** Which of the following was/were applied first time to problems in biology during Mendel's investigations into inheritance?
 (1) Statistical analysis
 (2) Mathematical logic
 (3) Computational devices
 (4) Both (1) and (2)
BPV373
- 11.** A true breeding line is that :-
 (1) Having undergone continuous cross pollination
 (2) Having undergone continuous self-pollination
 (3) Having undergone continuous vegetative propagation
 (4) Obtained through meristem tissue culture
BPV374
- 12.** How many true breeding pea plant varieties were selected by Mendel?
 (1) 7 (2) 14 (3) 21 (4) 28
BPV375
- 13.** Regarding a pair of dominant / recessive traits which of the following combination is wrong?
 (1) Flower colour – Violet / white
 (2) Flower position – Axial / terminal
 (3) Pod shape – Inflated / constricted
 (4) Seed colour – Green / yellow
BPV376
- 14.** Segregation of alleles is a random process so what would be the chances of a gamete containing either alleles?
 (1) 25% (2) 50%
 (3) 75% (4) 100%
BPV377
- 15.** Graphical representation to calculate the probability of all possible genotypes of offspring in a genetic cross, is known as :-
 (1) Mendel square
 (2) Punnett square
 (3) Crossboard method
 (4) Emasculation method
BPV378
- 16.** If F_1 individual of genotype (Tt) go through sexual reproduction, then it's gamete (pollen grain) with genotype (T) have what chances to pollinate eggs of the genotype (T)?
 (1) 25% (2) 50%
 (3) 75% (4) 100%
BPV379
- 17.** Mendel proposed how many conclusions to consolidate his understanding of inheritance in monohybrid cross?
 (1) One
 (2) Two
 (3) Three
 (4) None of the rules, he proposed laws/principles
BPV380
- 18.** The law of dominance is used to explain the expression of only one of the parental characters in a monohybrid cross in and the expression of both in.....
 (1) F_1 and F_2 (2) F_2 and F_3
 (3) F_1 and F_3 (4) F_2 and F_1
BPV381
- 19.** The fact that the alleles do not show any blending and that both the characters are recovered as such in F_2 generation, become the basis of :-

- (1) Law of Dominance
- (2) Law of paired factors
- (3) Law of segregation
- (4) Law of independent assortment

BPV382

20. In the theoretical explanation of allelic interaction for dominant and recessive forms, the recessive trait is seen due to production of-

- (1) Normal enzyme
- (2) A non-functional enzyme
- (3) No enzyme production
- (4) Either (2) or (3)

BPV383

21. In any dihybrid cross segregation of one pair of characters is independent of other pair of characters, is known as :-

- (1) Law of segregation
- (2) Law of purity of gametes
- (3) Law of independent assortment
- (4) Law of dominance

BPV385

22. In dihybrid mendelian cross how many types of genotype and phenotype will be obtained :-

- (1) 4 and 9 respectively
- (2) 9 and 4 respectively
- (3) 9 & 16 respectively
- (4) 4 & 16 respectively

BPV386

23. Mendel published his work in 1865 but it remained unrecognised till 1900. Which of the following reasons was not responsible for it?

- (1) Communication was not easy
- (2) His concept of genes (factors) as stable and discrete unit was not accepted by his contemporaries as an explanation for apparently continuous variations
- (3) Use of mathematics to explain biological phenomenon
- (4) Use of emasculation technique

BPV387

24. It was found that sometimes the F_1 had a phenotype that did not resemble either of the two parents and was in between the two. This is the case of :-

- (1) Dominance
- (2) Incomplete dominance
- (3) Codominance
- (4) Pleiotropism

BPV388

25. Multiple alleles can be found only when :-

- (1) Population studies are made
- (2) Individual study is made
- (3) Mutation is absent
- (4) Dominance is present

BPV389

26. In case of codominance :-

- (1) F_1 generation resembles both parents
- (2) F_1 generation is in between both parents
- (3) F_1 generation resembles either of the two parents
- (4) All of the above

BPV390

27. Incomplete dominance can be seen in :-

- (1) Flower colour in *Mirabilis jalapa*
- (2) Flower colour in *Pisum sativum*
- (3) Size of starch grains in pea
- (4) Both (1) and (3)

BPV391

28. Genes responsible for ABO blood group determines which of the following biomolecules of RBC plasma membrane?
 (1) Phospholipid
 (2) Proteins
 (3) Sugars
 (4) Cholesterol
BPV392
29. If there are four allelic forms for the gene controlling ABO blood group then what will be the number of possible genotypes?
 (1) 6 (2) 10 (3) 12 (4) 14
BPV393
30. Multiple alleles can be found during study of:
 (1) Gametes (2) Individual
 (3) Population (4) All of the above
BPV394
31. Shape of seed depends on starch granules size, so inheritance of seed shape show _____ relationship while inheritance of starch grains show _____.
 (1) Dominant recessive, codominance
 (2) Incomplete dominance, codominance
 (3) Dominant - recessive, incomplete dominance
 (4) Codominance, incomplete dominance
BPV395
32. Inheritance of starch grains size shows :-
 (1) Dominant recessive relationship
 (2) Codominance
 (3) Incomplete dominance
 (4) Multiple allelism
BPV396
33. In sickle cell anaemia which of the following genotype will show diseased phenotype :-
 (1) $Hb^A Hb^A$ (2) $Hb^S Hb^S$
 (3) $Hb^S Hb^A$ (4) Both (1) and (2)
BPV397
34. Which of the following is not concerned with sickle cell anaemia :-
 (1) Sixth position of β -chain
 (2) α -chain of Hb
 (3) Valine
 (4) Haemoglobin
BPV398
35. Polymerisation of mutant haemoglobin molecule in sickle cell anaemia is due to :-
 (1) Sulphadrigs
 (2) High oxygen
 (3) Low oxygen concentration
 (4) Plasmodium falciparum
BPV399
36. Which of the following is correct ?
 (1) When genes are grouped on the same chromosome, some genes are very tightly linked and showed very low recombination
 (2) When genes are loosely linked show very low recombination
 (3) When genes are tightly linked show higher recombination
 (4) When genes are loosely linked show no recombination
BPV400
37. In Morgan's experiment, what will be percentage of recombination in case of body colour and eye colour in *Drosophila* ?
 (1) 37.2% (2) 1.3%
 (3) 98.7% (4) 37.2%
BPV401
38. In a large number of insects the mechanism of sex determination is of :-
 (1) XO type (2) XY type
 (3) ZW type (4) All the above
BPV402

39. Male heterogamety found in :-
 (1) Human (2) Grasshopper
 (3) Many birds (4) Both (1) and (2)

BPV403

40. Which of the following characters of *Drosophila* is not suitable for genetical studies
 (a) They could be grown on simple synthetic medium in laboratory
 (b) They complete their life cycle in about 2-weeks
 (c) Single mating produces few number of progeny flies.
 (d) They have many types of hereditary variations that can be seen with low power microscope.
 (e) Male & Female flies are not easily distinguishable
 (1) a, b, c (2) a, b, c, d, e
 (3) d and e (4) c and e

BPV404

41. Parallelism between chromosome and behaviour of gene was established by :-
 (1) de Vries, Correns and Tschermak
 (2) Sutton and Boveri
 (3) Bateson and Punnett
 (4) Landsteiner and de Castello

BPV405

42. Who among the following united the knowledge of chromosomal segregation with Mendelian principles and called it chromosomal theory of inheritance?
 (1) Bateson (2) Boveri
 (3) Sutton (4) Correns

BPV406

43. Experimental verification of chromosomal theory of inheritance was done by :-
 (1) Tschermak (2) de Vries
 (3) Sutton (4) Morgan

BPV407

44. *Drosophila melanogaster* is best material for study of inheritance. Which of the following reason is not appropriate for selection of *Drosophila* ?
 (1) They can grow on simple synthetic medium
 (2) They complete their life cycle in about two weeks
 (3) Single mating could produce small number of progeny
 (4) Clear differentiation of the sexes

BPV408

45. Who among the following used the frequency of recombination between gene pairs on the same chromosome as a measure of distance between genes and mapped their position?
 (1) Davenport
 (2) Sturtevant
 (3) Morgan
 (4) Nillson

BPV409

46. If yellow body, white eyed *Drosophila* is crossed with wild brown body red eyes *Drosophila*. Then what would be frequency of recombinants in F_1 generation?
 (1) 100 %
 (2) 1.3 %
 (3) 98.7 %
 (4) 0 %

BPV410

47. Which of the following structure was discovered by Henking ?
 (1) y-body
 (2) Bar body
 (3) x-body
 (4) Nu-body

BPV411

48. In some insect's half of the sperms possess X chromosome along with autosomes while half of the sperms carries :-

(1) Only autosomes
 (2) y chromosome along with autosome
 (3) x chromosome only
 (4) x chromosome along with autosomes

BPV412

49. Female heterogamety can be seen in :-

(1) Human beings
 (2) Drosophila
 (3) Hen
 (4) Honey bees

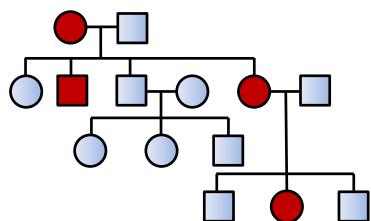
BPV413

50. Which symbol of pedigree is correctly matched?

(1)  – Female
 (2)  – affected offspring
 (3)  – Affected male of autosomal recessive disease
 (4)  – Marriage between relatives

BPV414

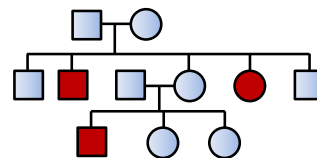
51. Given pedigree represents inheritance of myotonic dystrophy which is an autosomal dominant disorder. What will be genotype of parents ?



(1) Mother - aa Father - AA
 (2) Mother - AA Father - aa
 (3) Mother - Aa Father - aa
 (4) Mother - aa Father - aa

BPV415

52. Given pedigree chart shows inheritance of autosomal recessive trait (for e.g. - sickle cell anaemia) then what will be genotype of parents ?



(1) Father - (Aa) Mother - (aa)
 (2) Father - (aa) Mother - (aa)
 (3) Father - (Aa) Mother - (Aa)
 (4) Father - (AA) Mother - (AA)

BPV416

53. Mendelian disorder are mainly determined by:
 (1) Alteration or mutation in single gene
 (2) Absence of one chromosome
 (3) Excess of one of more chromosome
 (4) All the above

BPV417

54. Study of family history about inheritance of a particular trait in several generations of a family is called :-

(1) Phylogeny (2) Ontogeny
 (3) Pedigree analysis (4) Cladistics

BPV418

55. Genetic disorders determined by alteration or mutation in single gene are known as :-

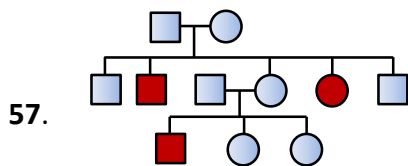
(1) Chromosomal disorders
 (2) Mendelian disorders
 (3) Non inheritable disorders
 (4) All the above

BPV420

56. Which of the following is not a Mendelian disorder ?

(1) Haemophilia
 (2) Cystic fibrosis
 (3) Cry-du-chat syndrome
 (4) Sickle cell anaemia

BPV421



In this given pedigree what is the mode of inheritance?

- (1) Autosomal dominant
- (2) Autosomal recessive
- (3) X-linked dominant
- (4) X-linked recessive

BPV422

58. Chromosomal disorders arise due to :-

- (1) Absence of one or more chromosomes
- (2) Excess of one or more chromosomes
- (3) Abnormal arrangement of one or more chromosomes
- (4) All the above

BPV423

(B) ANALYTICAL QUESTIONS

59. On crossing red & white flowered plants the ratio of red and white flowered plants in F_2 -generation was 60:20, then on selfing the heterozygous red flowered plants, the offsprings would be :-

- (1) 72:24
- (2) 40:60
- (3) 52:48
- (4) 84:16

BPV424

60. What is the probability of homozygous plants for both dominant characters in F_2 generation of a dihybrid cross ?

- (1) $1/16$
- (2) $3/16$
- (3) $4/16$
- (4) $9/16$

BPV425

61. An offspring of two homozygous parents differing from one another by alleles at only one gene locus is known as :-

- (1) Back cross
- (2) Monohybrid
- (3) Dihybrid
- (4) Trihybrid

BPV426

62. Cross $AABb \times aaBb$ yields

$AaBB : AaBb : Aabb : aabb$ offspring in the ratio of :-

- (1) $0 : 3 : 1 : 1$
- (2) $1 : 2 : 1 : 0$
- (3) $1 : 1 : 1 : 1$
- (4) $1 : 2 : 1 : 1$

BPV427

63. Mrs. Verma has an autosomal gene pair 'Bb' and she contains X-linked gene 'd' both on of her X-chromosome. What is the percentage of gamete which contain 'bd' genes ?

- (1) $1/2$ or 50%
- (2) $1/4$ or 25%
- (3) $3/4$ or 75%
- (4) 1 or 100%

BPV428

64. A dihybrid plant on self pollination, produced 400 seeds with 9 types of genotype. How many seeds will have genotype TtRr ?

- (1) 200
- (2) 100
- (3) 50
- (4) 150

BPV429

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

- (1) Both homozygous
- (2) One homozygous and other heterozygous
- (3) Both heterozygous
- (4) Both hemizygous

BPV430

66. In a dihybrid cross where two parents differ in two pairs of contrasting traits like seed colour yellow (YY) and seed colour green (yy) with seed shape round (RR) and seed shape wrinkled (rr). The number of green coloured seeds (yy) among sixteen products of F_2 generation will be :-

- (1) 2 (2) 4
(3) 6 (4) 8

BPV431

67. Select the incorrect statement for Gregor Mendel :-

- (1) He conducted hybridization experiments on garden pea for seven years.
(2) He applied statistical analysis and mathematical logic for the first time to the problems in biology.
(3) His experiments had a small sampling size.
(4) He conducted artificial cross-pollination experiments using several true-breeding pea lines.

BPV432

68. "When two pairs of traits are combined in a hybrid, segregation of one pair of characters is independent of the other pair of characters". This explains :-

- (1) Law of dominance
(2) Law of segregation
(3) Law of independent assortment
(4) Postulate of paired factors

BPV433

69. Which of the following is not observed in a monohybrid cross?

- (1) Recessive parental trait is expressed without any blending in the F_2 -generation
(2) Recessive parental trait is expressed without any blending in the F_1 -generation
(3) Dominance also explains the proportion of 3 : 1 obtained at the F_2
(4) Genotype ratio is 1 : 2 : 1

BPV434

70. When AABbCc is crossed with AaBbCc then the ratio of hybrid for all the three genes is:-

- (1) 1/8 (2) 1/4
(3) 1/16 (4) 1/32

BPV435

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

- (1) All the offsprings will be tall with red fruit
(2) 25% will be tall with red fruit
(3) 50% will be tall with red fruit
(4) 75% will be tall with red fruit

BPV436

72. Out of three characters on chromosome no. 4, two characters indicate linkage and not mentioned by Mendel. These characters were:-

- (1) Pod shape – stem length
(2) Pod shape – seed colour
(3) Pod shape – pod colour
(4) Pod colour – stem length

BPV437

73. The Punnett square shown below represents the pattern of inheritance in dihybrid cross when yellow (Y) is dominant over white (y) and round (R) is dominant over wrinkled (r) seeds.

	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 :-

- (1) Type M (2) Type J
(3) Type P (4) Type N

BPV438

74. In a plant gene 'A' is responsible for tallness and its recessive allele 'a' for dwarfness and 'B' is responsible for red flower colour and its recessive allele 'b' for white flower colour. A tall and red flowered plant with genotype AaBb crossed with dwarf and red flowered (aaBb). What is the percentage of dwarf-white flowered offspring of above cross :-

- (1) 50% (2) 6.25% (3) 12.5% (4) 50%

BPV439

75. Which of the following points is of Mendelism?

- (1) law of independent assortment which was based on monohybrid cross
(2) law of independent assortment which could be stated on the basis of segregation of gametes
(3) incomplete dominance gave a new way to mendelism
(4) a character is controlled by a pair of unit factors

BPV440

76. If Aabb × aaBb, then genotypic ratio of its progeny will be :-

- (1) 9 : 3 : 3 : 1 (2) 1 : 2 : 1
(3) 1 : 1 : 1 : 1 (4) 4 : 1

BPV441

77. Red and tall dominant character hybrid plant when crossed with recessive white dwarf plant (RrTt × rrtt). What will be the ratio of respective four combinations red tall, red dwarf, white tall and white dwarf plants in the next generation :-

- (1) 9 : 3 : 3 : 1 (2) 15 : 1 : 0 : 0
(3) 9 : 3 : 4 : 0 (4) 4 : 4 : 4 : 4

BPV442

78. A plant with genotype AABbCcDD is self pollinated. Provided that the four genes are independently assorting, what proportion of the progeny will show the genotype AAbbccDD ?

- (1) $\frac{1}{4}$ (2) $\frac{1}{16}$ (3) $\frac{1}{64}$ (4) $\frac{1}{256}$

BPV443

79. A person with unknown blood group under ABO system, has suffered much blood loss in an accident and needs immediate blood transfusion. His one friend who has a valid certificate of his own blood type, offers for blood donation without delay. What would have been the type of blood group of the donor friend?

- (1) Type B (2) Type AB
(3) Type O (4) Type A

BPV444

80. In a family, father has a blood group 'A' and mother has a blood group 'B'. Their children show 50% probability for a blood group 'AB' indicating that :-

(1) Father is heterozygous
(2) Mother is heterozygous
(3) Either of parent is heterozygous
(4) Mother is homozygous

BPV445

81. In man, gene producing the disease phenyl ketonuria also produces a number of abnormal phenotypic traits, which are collectively syndrome. This gene results mental retardation, widely spaced incisors, pigmented patches on the skin and excessive sweating such types of genes are called :-

(1) Polygene
(2) Pleiotropic gene
(3) Lethal gene
(4) Supplementary gene

BPV446

82. Which one of the following conditions though harmful in itself, is also a potential saviour from a mosquito borne infectious disease :-

(1) Thalassaemia
(2) Sickle cell anaemia
(3) Pernicious anaemia
(4) Leukaemia

BPV447

83. Which of the four couples, claiming the baby with O⁺ blood type are possibly the biological parents of it?

(1) AB⁻ and A⁺ (2) A⁺ and O⁻
(3) O⁺ and AB⁺ (4) B⁻ and O⁻

BPV448

84. In a plant flower colour is the example of quantitative trait and controlled by one gene pair. How many plants show parental phenotype in F₂ generation:-

(1) $\frac{2}{16}$ (2) $\frac{2}{4}$ (3) $\frac{2}{64}$ (4) $\frac{2}{256}$

BPV449

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

(1) two (2) three
(3) four (4) five

BPV450

86. A scientist performed the gene mapping experiments in maize. He mapped the genes on chromosomes on the basis of % crossing over between different genes. One map unit corresponds to one % crossing over or recombination. The genes showing more than 50% recombination were not supposed to be linked on same chromosome. In crossing over studies on maize, scientist observed the following % crossing over between genes A, B, C, D- between A and D 10%, between A and C 3%, between genes C and D 7%, between genes A and B 5%, and between genes C and B 8%. On the basis of above observation find out the correct sequence of genes A, B, C and D on chromosomes:-

(1) BCDA (2) ABCD
(3) BACD (4) DACB

BPV451

87. A test cross of F_1 flies $a^+ / +b$ produced the following offspring

$$++/ab = 9 \quad ab/ab = 9$$

$$+b/ab = 41 \quad a^+/ab = 41$$

What will be distance between linked gene?

- (1) 82 cM (2) 18 cM (cis)
(3) 20 cM (4) 18 cM (trans)

BPV452

88. A man and woman are both affected by vitamin D resistance rickets, which is a dominant sex-linked allele. All the female offsprings of this couple are affected with rickets but some of the male offsprings are not. What are the genotypes of the parents?

- (1) Both are homozygous for the trait.
(2) The woman has two dominant alleles and man has one dominant allele.
(3) Both parents have only recessive alleles.
(4) Each parent has only one dominant allele.

BPV453

89. Depending upon the distance between any two genes which is inversely proportional to the strength of linkage, cross overs will vary from :-

- (1) 50-100% (2) 0-50%
(3) 75-100% (4) 100-150%

BPV454

90. What shall be the ratio of heterozygous normal, homozygous colour blind and colourblind hemizygous in offsprings of a colour blind husband & a carrier wife :-

- (1) 1:1:2 (2) 1:1:1
(3) 2:1:1 (4) 1:2:1

BPV455

91. A and B genes are completely linked. What shall be genotype of progeny in a cross between AB/ab and ab/ab :-

- (1) $AAbb$ and $aabb$ (2) $AaBb$ and $aabb$
(3) $AABB$ and $aabb$ (4) None

BPV456

92. Mendelian dihybrid and dihybrid with linkage are respectively related with how many chromosomes :-

- (1) 1 pair & 2 pair (2) 2 pair & 1 pair
(3) 2 pair & 2 pair (4) 1 pair & 1 pair

BPV457

93. In *Drosophila* the XXY condition leads to femaleness whereas in human beings the same condition leads to Klinefelter's syndrome in male. It proves :-

- (1) In human beings Y-chromosome is active in sex determination.
(2) Y-chromosome is active in sex determination in both human beings and *Drosophila*.
(3) In *Drosophila* Y-chromosome decides femaleness.
(4) Y-chromosome of man has genes for syndrome.

BPV458

94. Based on observation on monohybrid crosses Mendel draw some conclusion. Which of the following is not correct :-

- (1) Characters are controlled by discrete units called factors
(2) Factors occur in pairs
(3) In a similar pair of factors one member of the pair dominates the other
(4) The postulate of dominance also explains the proportion of 3 : 1 obtained at the F_2

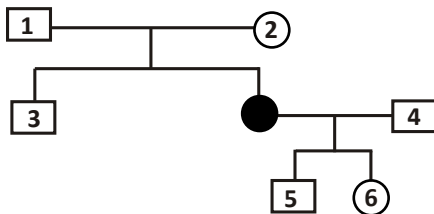
BPV459

95. Which is incorrect ?

- (i) ABO blood groups are controlled by the gene-I
 - (ii) Gene I has four alleles
 - (iii) I^A and I^B produce same type of sugar
 - (iv) i or I^o produce different type of sugar
 - (v) I^A and I^B are incomplete dominant
- (1) i, ii (2) v, ii
(3) ii, iii, iv (4) ii, iii, iv, v

BPV460

96. The pedigree shows the occurrence of albinism which is a recessive trait. If person 4 is homozygous, the carrier for the trait is:-



- → female, □ → male, ● → albinism
- (1) 1, 4, 5 and 6 (2) 5 and 6
(3) 1, 2 and 3 (4) 1, 2, 5 and 6

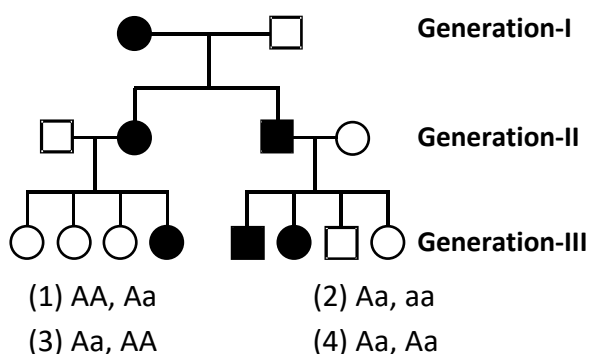
BPV461

97. A human male is heterozygous for autosomal gene A, B and G. He is also hemizygous for haemophilic gene h. What proportion of his sperm will be abgh:-

- (1) $\frac{1}{4}$ (2) $\frac{1}{8}$ (3) $\frac{1}{16}$ (4) $\frac{1}{32}$

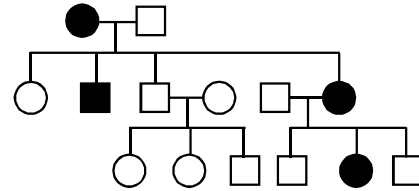
BPV462

98. A pedigree is shown below for a disease that is autosomal dominant. The genetic make up of the first generation is :-



BPV463

99. Given below is the pedigree of an autosomal dominant disorder-Myotonic dystrophy.



In this pedigree the genotype of all affected children will be :-

- (1) AA (2) Aa
(3) AA or Aa (4) aa

BPV464

100. Phenotype of an organism is the result of :-

- (1) Mutations and linkages
- (2) Cytoplasmic effects and nutrition
- (3) Environmental changes and sexual dimorphism
- (4) Genotype and environment interactions

BPV265

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

- (1) Three (2) Four
(3) Nine (4) Two

BPV266

102. Test cross involves :-

- (1) Crossing between two genotypes with recessive trait
- (2) Crossing between two F_1 hybrids
- (3) Crossing the F_1 hybrid with a double recessive genotype
- (4) Crossing between two genotypes with dominant trait

BPV267

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

- (1) Only round seeds with green cotyledons
- (2) Only wrinkled seeds with yellow cotyledons
- (3) Only wrinkled seeds with green cotyledons
- (4) Round seeds with yellow cotyledons, and wrinkled seeds with yellow cotyledons

BPV268

104. Which one of the following is the most suitable medium for culture of *Drosophila melanogaster* ?

- (1) Moist bread
- (2) Agar-agar
- (3) Ripe banana
- (4) Cow dung

BPV269

105. If a colourblind woman marries a normal visioned man, their sons will be :-

- (1) All normal visioned
- (2) One-half colourblind & one-half normal
- (3) Three-fourths colourblind & one-fourth normal
- (4) All colourblind

BPV270

106. In which mode of inheritance do you expect more maternal influence among the offspring?

- | | |
|---------------|-----------------|
| (1) Autosomal | (2) Cytoplasmic |
| (3) Y-linked | (4) X-linked |

BPV271

107. A human male produces sperms with the genotypes AB, Ab, aB, and ab, in equal proportions. What is the corresponding genotype of this person :-

- (1) AaBb (2) AaBB (3) AABb (4) AABB

BPV272

108. 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 :-

- (1) 50 : 50 (2) 9 : 1 (3) 1 : 3 (4) 3 : 1

BPV273

109. Inheritance of skin colour in humans is an example of :-

- (1) chromosomal aberration
- (2) point mutation
- (3) polygenic inheritance
- (4) codominance

BPV274

110. Two genes R and Y are located very close on the chromosomal linkage map of maize plant. When $RRYY$ and $rryy$ genotypes are hybridized, the F_2 segregation will show :-

- (1) Higher number of the recombinant types.
- (2) Segregation in the expected 9:3:3:1 ratio.
- (3) Segregation in 3:1 ratio.
- (4) Higher number of the parental types

BPV275

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

- (1) Erythroblastosis fetalis –X linked
- (2) Down syndrome – 44 autosomes + XO
- (3) Klinefelter's syndrome –44 autosomes +XXY
- (4) Colour blindness – Y linked

BPV276

112. Sickle cell anaemia is :-

- (1) Characterized by elongated sickle like RBCs with a nucleus.
- (2) An autosomal linked dominant trait.
- (3) Caused by substitution of valine by glutamic acid in the beta globin chain of haemoglobin.
- (4) Caused by a change in a single base pair of DNA.

BPV277

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

- (1) No antigens A and B on RBCs
- (2) Other antigens besides A and B on RBCs
- (3) Overdominance of this type on the genes for A and B types
- (4) One antibody only - either anti-A or anti-B on the RBCs

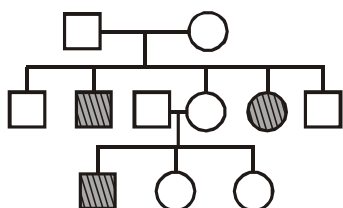
BPV278

114. Select the incorrect statement from the following:

- (1) Baldness is a sex-limited trait.
- (2) Linkage is an exception to the principle of independent assortment in heredity.
- (3) Galactosemia is an inborn error of metabolism.
- (4) Small population size results in random genetic drift in a population.

BPV279

115. Study the pedigree chart given below :-



What does it show :-

- (1) Inheritance of a recessive sex-linked disease like haemophilia.
- (2) Inheritance of a sex-linked inborn error of metabolism like phenylketonuria.
- (3) Inheritance of a condition like phenylketonuria as an autosomal recessive trait.
- (4) The pedigree chart is wrong as this is not possible.

BPV280

116. The genotype of a plant showing the dominant phenotype can be determined by

- (1) Pedigree analysis
- (2) Back cross
- (3) Test cross
- (4) Dihybrid cross

BPV281

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

- (1) Alleles do not show any blending and both the characters recover as such in F_2 -generation.
- (2) Factors occur in pairs.
- (3) The discrete unit controlling a particular character is called a factor.
- (4) Out of one pair of factors one is dominant and the other recessive.

BPV282

118. 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?

- (1) Four
- (2) Two
- (3) Three
- (4) One

BPV283

119. Select the correct statement from the ones gives below with respect to dihybrid cross :

- (1) Genes loosely linked on the same chromosome show similar recombination as the tightly linked ones.
- (2) Tightly linked genes on the same chromosome show very few recombination's.
- (3) Tightly linked genes on the same chromosome show higher recombination.
- (4) Genes far apart on the same chromosome show very few recombination's.

BPV284

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

- (1) $\square$ = unaffected female
- (2) $\blacklozenge$ = male affected
- (3) $\square \text{---} \bigcirc$ = mating between relatives
- (4) $\bigcirc$ = unaffected male

BPV285

121. When two unrelated individuals or lines are crossed, the performance of F_1 hybrid is often superior to both its parents. This phenomenon is called :-

- (1) Heterosis
- (2) Transformation
- (3) Splicing
- (4) Metamorphosis

BPV286

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

- (1) Homozygous sex chromosomes (ZZ) determine female sex in birds.

- (2) XO type of sex chromosomes determine male sex in grasshopper.
- (3) XO condition in humans as found in Turner Syndrome, determines female sex.
- (4) Homozygous sex chromosomes (XX) produce male in *Drosophila*.

BPV287

123. Test cross in plants or in *Drosophila* involves crossing :-

- (1) Between two genotypes with dominant trait.
- (2) Between two genotypes with recessive trait.
- (3) Between two F_1 hybrids.
- (4) The F_1 hybrid with a double recessive genotype.

BPV288

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

- (1) One X and one Y chromosome
- (2) Two X chromosomes
- (3) Only one Y chromosome
- (4) Only one X chromosome

BPV289

125. 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:-

- (1) Monohybrid cross with complete dominance.
- (2) Monohybrid cross with incomplete dominance.
- (3) Co-dominance
- (4) Dihybrid cross

BPV290

126. 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 ?

- (1) Blood group O (2) Blood group A
(3) Blood group B (4) Blood group AB

BPV291

127. 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?

- (1) 25% (2) 50%
(3) 100% (4) Zero percent

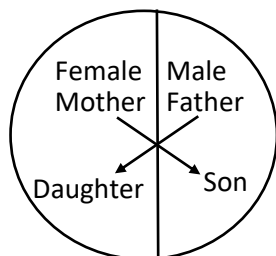
BPV292

128. A test cross is carried out to :-

- (1) assess the number of alleles of a gene.
(2) determine whether two species or varieties will breed successfully.
(3) determine the genotype of a plant at F_2
(4) predict whether two traits are linked.

BPV293

129. Represented below is the inheritance pattern of a certain type of traits in humans. Which one of the following conditions could be an example of this pattern?



- (1) Haemophilia
(2) Thalassemia
(3) Phenylketonuria
(4) Sickle cell anaemia

BPV294

130. 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 :-

- (1) Complete dominance
(2) Codominance
(3) Incomplete dominance
(4) Partial dominance

BPV295

131. Which Mendelism idea is depicted by a cross in which the F_1 -generation resembles both the parents?

- (1) co-dominance
(2) incomplete dominance
(3) law of dominance
(4) inheritance of one gene

BPV296

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

- (1) If the genes are present on the same chromosome, they undergo more than one crossovers in every meiosis.
(2) The genes may be on different chromosomes.
(3) The genes are tightly linked.
(4) The genes show independent assortment.

BPV297

133. The **incorrect** statement with regard to Haemophilia is :-

- (1) A single protein involved in the clotting of blood is affected
- (2) It is a sex-linked disease
- (3) It is a recessive disease
- (4) It is a dominant disease

BPV298

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

- (1) 100% (2) No chance
- (3) 50% (4) 25%

BPV299

135. The ultimate biological unit which controls heredity, is called :

- (1) Genome
- (2) Chromosome
- (3) Genotype
- (4) Gene

BPV486

136. In case of inheritance of one gene, 3 : 1 phenotypic ratio in F_2 generation can be explained on the basis of-

- (1) Incomplete dominance
- (2) Codominance
- (3) Dominance
- (4) Linkage

BPV487

EXERCISE-III

ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	1	2	2	3	4	1	3	2	3	4	2	2	4	2	2
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	2	3	1	3	4	3	2	4	2	1	1	4	3	2	3
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	3	3	2	2	3	1	2	1	4	4	2	3	4	3	2
Question	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Answer	4	3	1	3	4	3	3	1	3	2	3	2	4	1	1
Question	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Answer	2	2	1	2	3	2	3	3	2	1	3	1	4	3	4
Question	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Answer	3	4	2	3	3	2	2	2	2	2	3	4	4	2	2
Question	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
Answer	2	2	1	3	4	4	3	2	2	4	4	3	4	3	4
Question	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Answer	2	1	1	3	4	3	4	1	1	3	3	1	1	2	3
Question	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135
Answer	1	2	4	2	2	1	4	3	1	2	1	3	4	4	4
Question	136														
Answer	3														

Important Notes