



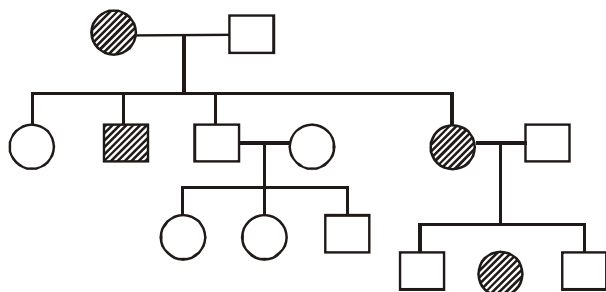


GENETICS : PRINCIPLES OF INHERITANCE & VARIATIONS

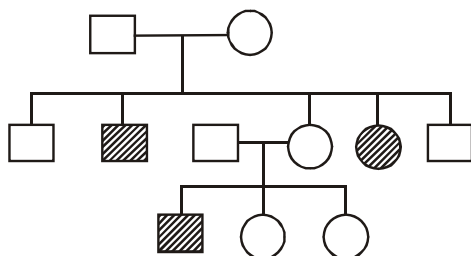
1. Variations are :
 - (1) Degree by which progeny differs from their parents
 - (2) Degree by which progeny similar to their parents
 - (3) Process by which characters are passed on from parent to progeny
 - (4) True breeding lines
2. Mendel found that the F_1 always resembled either one of the parents 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
3. 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
4. In monohybrid cross proportion of 3 : 1 explains:
 - (1) Dominance
 - (2) Segregation
 - (3) Both (1) and (2)
 - (4) Unit factor
5. 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
6. Theoretically, the modified allele could be responsible for the production of :
 - (1) less efficient enzyme
 - (2) A non functional enzyme
 - (3) Non enzyme at all
 - (4) All the above
7. 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
8. Recessive traits are seen due to :
 - (1) Formation of non functional enzyme
 - (2) Enzyme is not produced
 - (3) 1 and 2 both
 - (4) Formation of functional enzyme
9. 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
10. 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
11. 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%
12. 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
13. Male heterogamety found in :
 - (1) Human
 - (2) Grasshopper
 - (3) Many birds
 - (4) 1 and 2 both
14. Which symbol of pedigree is correctly matched ?
 - (1)  – Female
 - (2)  – affected offspring
 - (3)  – Affected male of autosomal recessive disease
 - (4)  – Marriage between relatives

15. 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

16. Given pedigree chart shows inheritance of autosomal recessive trait (for eg - sickle cell anaemia) then what will be genotype of parent ?



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

17. A diploid organism is heterozygous for 4 loci, how many types of gametes can be produced?

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

18. 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%

19. 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 the above

20. Mendelian disorder are mainly determined by :

- (1) Alternation or mutation in single gene
 (2) Absence of one chromosome
 (3) Excess of one of more chromosome
 (4) All the above

21. 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 hereditaty 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

22. 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) 1 and 3 both

23. Which of the following cow breed comes in existence through artifical selection and domestication from ancestral wild cows

- (1) Brown swiss (2) Jamanapari
 (3) Murrah (4) Sahiwal

24. 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

- 25.** 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) Obtain through tissue culture (Meristem)
- 26.** How many true breeding pea plant varieties were selected by Mendel
- (1) 7
 - (2) 14
 - (3) 21
 - (4) 28
- 27.** Regarding to pair of dominant and recessive trait 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
- 28.** 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 %
- 29.** 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
- 30.** If F_1 individual of genotype (Tt) go through sexual reproduction, then it's gamete (pollengrain) with genotype (T) have what chances to pollinate eggs of the genotype (T)
- (1) 25 %
 - (2) 50 %
 - (3) 75 %
 - (4) 100 %
- 31.** 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
- 32.** 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
- 33.** The fact that the alleles donot 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
- 34.** 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
- 35.** Genes responsible for ABO blood group determines which of the following biomolecules of RBC plasma membrane
- (1) Phospholipid
 - (2) Proteins
 - (3) Sugars
 - (4) Chosteroles
- 36.** 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
- 37.** Multiple alleles can be found during study of
- (1) Gametes
 - (2) Individual
 - (3) Population
 - (4) All above
- 38.** 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
- 39.** Inheritance of starch grains size shows
- (1) Dominant recessive relationship
 - (2) Codominance
 - (3) Incomplete dominance
 - (4) Multiple allelism
- 40.** Dominance of any character generally depends on
- (1) Gene or product related informations of any gene
 - (2) Character choosen by ourself in study
 - (3) Environmental factors
 - (4) Both 1 and 2

41. 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
42. In dihybrid mendelian cross how many types of genotype and phenotype will be obtain
- (1) 4 and 9 respectively
 - (2) 9 and 4 respectively
 - (3) 9 & 16 respectively
 - (4) 4 & 16 respectively
43. Mandel published his work in 1865 but it remained unrecognised till 1900. Which of the following reason 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
44. 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
45. 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
46. Experimental verification of chromosomal theory of inheritance was proposed by
- (1) Tschermak
 - (2) de Vries
 - (3) Sutton
 - (4) Morgan
47. *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
48. 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) Nilsson
49. 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 %
50. Which of the following structure was discovered by Henking
- (1) y-body
 - (2) Bar body
 - (3) x-body
 - (4) Nu-body
51. In some insects 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
52. Female heterogamety can be seen in
- (1) Human beings
 - (2) *Drosophila*
 - (3) Hen
 - (4) Honey bees
53. Chromosomal aberrations are commonly observed in :-
- (1) Germinal cells
 - (2) Cancer cells
 - (3) Nail base cells
 - (4) Gametes
54. Study of family history about inheritance of a particular trait in several generations of a family called
- (1) Phylogeny
 - (2) Ontogeny
 - (3) Pedigree analysis
 - (4) Cladistics

55. Symbols \diamond used in pedigree analysis, represents

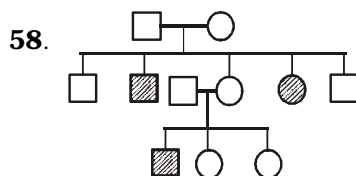
- (1) Five offspring with unspecified sex
- (2) Five diseased offspring
- (3) Five unaffected offspring
- (4) Five affected offsprings

56. 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 above

57. Which of the following is not a Mendelian disorder

- (1) Haemophilia
- (2) Cystic fibrosis
- (3) Cryduchat syndrome
- (4) Sickle cell anaemia



In this given pedigree what is the mode of inheritance

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

59. In sickle cell anaemia which of the following genotype will show disease phenotype

- (1) $Hb^A Hb^A$
- (2) $Hb^S Hb^S$
- (3) $Hb^S Hb^A$
- (4) Both 1 and 2

60. 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

61. Polymerisation of mutant haemoglobin molecule in sickle cell anaemia is due to

- (1) Sulphadruugs
- (2) High oxygen
- (3) Low oxygen concentration
- (4) Plasmodium falciperum

62. Regarding to phenylketonuria which of the following statement is wrong

- (1) Phenylalanine can not convert into tyrosine
- (2) Phenylalanine convert into phenylpyruvate and derivatives
- (3) Phenylpyruvate deposited in heart, liver and kidney
- (4) This is inborn error of metabolism

63. 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

64. Which of the following symptom is not associated with Down's syndrome

- (1) Flat back of head
- (2) Many loops on finger tips
- (3) Big and wrinked tongue
- (4) Congenital liver diseases

65. Match the folloiwng

(A) Down's Syndrome	(i)	44 + XY
(B) Klinefelter's Syndrome	(ii)	45 + XY
(C) Turner's Syndrome	(iii)	44 + XO
(D) Phenylketonuria	(iv)	44 + XXY

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

66. Retarded physical, psychomotor and mental development are consequences observed during

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

67. Gynaecomastia state can be seen in

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

68. Match the following

- | | |
|----------------------------|---|
| (A) Haemophilia | (i) Board plam with
characteristic
palm creased |
| (B) Down's Syndrome | (ii) Delayed clotting of
blood |
| (C) Klinefelter's syndrome | (iii) Some feminine
character |
| (D) Turner's Syndrome | (iv) Rudimentary
ovaries |

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

ANSWERS KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	1	2	2	3	2	4	1	3	1	1	2	1	4	4	3	3	2	3	1	1
Que.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	4	4	4	4	2	2	4	2	2	2	3	1	3	4	3	2	3	3	3	4
Que.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	3	2	4	2	3	4	3	2	4	3	1	3	2	3	3	2	3	2	2	2
Que.	61	62	63	64	65	66	67	68												
Ans.	3	3	4	4	2	1	2	4												