EXERCISE-2

Exception of Mendelism, Cytoplasmic Inheritance

1. In Mirabilis & Antirrhinum plant the appearence 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

2. Exception to mendel's law is found in flower colourof
(1) Mirabilis (2) Sweet - pea
(3) Garden-pea (4) Beans

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

4. In case of incomplete dominance the monohybrid ratio of phenotypes in F2 generation is :-
(1)1:2:1 (2)3:1:1
(3)9:3:3:1 (4)2:3:1

5. A white flowered mirabilis plant rr was crossed with red coloured RR, If 120 plants are produced in F2 generation .the result would be :-
(1) 90 uniformly coloured & 30 white
(2) 90 Non-uniformly coloured & 30 white
(3) 60 Non-uniformly coloured & 60 white
(4) All coloured & No white

6. When the phenotypic and genotypic ratios resemble in the F2 generation it is an example of :-
(1) Independant assortment
(2) Qualitative inheritance
(3) Segregation of factors
(4) Incomplete dominance

7. Which one carries extra nuclear genetic material
(1) Plastids (2) Ribosomes
(3) Chromosomes (4) Golgi-complex

8. When certain character is inherited only through the female parent, it probably represents the caseof:-
(1) Mendelian nuclear inheritance
(2) Multiple plastid inheritance
(3) Cytoplasmic inheritance
(4) Incomplete dominance

9. Cytoplasmic male sterility is inherited :-
(1) Maternally
(2) Paternally
(3) Both
(4) Bacteriophage multiplication

10. Mendel did not include in his laws :-
(1) Segregation (2) Dominance
(3) Purity of gametes (4) Linkage

11. 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 independant assortment
(4) Law of unit character

12. Which law would have been violated if mendel had chosen eight characters in garden -pea :
(1) Law of dominance
(2) Law of segregation
(3) Principle of independant assortment
(4) Law of purity of gametes

13 Mendel had a difficulty in explaining the linked characters due to :-
(1) Law of dominance
(2) Law of segregation
(3) Law of independant assortment
(4) All the above

14. In Mirabilis jalapa when homozygous red flowered and white flowered plants are crossed, all F: plants have pink coloured flowers. In F2 produced by selfing of Fj 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

15. The main aim of plant breeding is :-
(1) To produce improved varieties
(2) To make soil fertile
(3) To controle pollution
(4) To become more progressive

16. Plants having similar genotypes produced by plant

breeding are called :-
(1) Clone (2) Haploid

(3) Autopolyploid (4) Genome

17. 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

18. Plant, which does not obeys Mendel's laws :-
(1) Mirabilis jalapa (2) Pisum sativum
(3) Cicer aurietinum (4) Iberis amara

19. The first attempt to show linkage in plants was done
(1) Pisum sativum
(2) Lathyrus odoratus
(3) Zea mays
(4) Oenothera lamarckiana

20. In case of incomplete dominance, F2 generationhas
(1) Genotypic ratio equal to phenotypic ratio
(2) Genotypic ratio is 3:1
(3) Phenotypic ratio is 3:1
(4) None

21. 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

22. With increasing age the linkage becomes :-
(1) Strong
(2) Weak
(3) Terminates
(4) Remains unchanged

23. Coupling and Repulsion theory produced by :-
(1) Morgan (2) Bateson
(3) Muller (4) De vries

24. In which type of inheritance the results are affected by reciprocal cross :-
(1) Nuclear (2) Cytoplasmic
(3) Blending (4) All the above

25. If there were only parental combinations in F2 of a dihybrid cross then mendel might have discovered :-
(1) Independent assortment (2) Atavism
(3) Linkage (4) Repulsion

26. Plants similar to mother plant can be obtained from
(1) Seeds (2) Stem cutting
(3) Both of these (4) None of these

27. Linkage discovered in Drosophila by :-
(1) Bateson (2) Morgan
(3) Muller (4) Correns

28. Mendelian dihybrid and dihybrid with linkage are respectively realated with how many chromosomes :-
(1) 1 pair & 2 pair (2) 2 pair & 1 pair
(3) 2 pair & 2 pair (4) 1 pair & 1 pair

29. Incomplete dominance occurs in :-
(1) Mirabilis (2) Antirrhinum
(3) Andulasion fowl (4) All of the above

30. A dihybrid plant with incomplete linkage on test cross may produce how many types of plants:-
(1) 2 (2) 4
(3) 8 (4) 1

31. How many linkage group are there in nucleoid of bacteria :-
(1) One (2) Two
'(3) Four (4) None

32. Which cross yields red, white & pink flowers variety of dog flower :-
(1) RR X Rr (2) Rr X RR
(3) Rr X Rr (4) Rr X rr

33. What shall be ratio in offspring when a roan cow is crossed with a white bull :-
(1) 1:2:1 (2) 3:1
(3) 1:1 (4) All roan

34. If distance between gene on chromosome is more, then gene shows :-
(1) Weak linkage (2) Strong linkage
(3) Less crossing (4) 1 & 3 both

35. Linked gene shows :-
(1) Always parental combination
(2) Sometimes new combinations
(3) Always new combination
(4) New combination more

36. The number of linkage groups in a cell having 10 pairs of chromosomes are :-
(1)5 (2)10
(3)15 (4)20

37. Cytology + genetics were marged into "Cytogenetics" by one of following :-
(1) Bateson (2) Punnet
(3) Morgan (4) Muller

38. Phenotypic ratio in co dominance :-
(1) 1:2:1 (2) 3:1
(3) 2:1 (4) 2:1:3

39. Which of the following is exception to Mendel's laws
(1) Linkage
(2) Incomplete dominance
(3) Co-dominance
(4) All of the above

40. A roan bull is bred to three cows. Cow A has the same genotype as the roan bull, cow B is red and cow C is white, what proportions of roan cows are expected in the off springs of each group of cows :-
(1)2,1,1 (2)1,2,1
(3)1,1,2 (4)3,1

41. 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

42. Complete linkage is found in :-
(1) Birds (2) Snakes
(3) Female- Drosophila (4) Male - Drosophila

43. A phenomenon which works opposite to the linkage is :-
(1) Independent assortment
(2) Crossing-over
(3) Segregation
(4) Mutation

44. The scientist who first discovered cytoplasmic - inheritance was :-
(l)Correns (2) Rhoades
(3) Mendel (4) Morgan

45. Shell coiling in Limnaea (Snail) is an example of :-
(1) Maternal inheritance
(2) Biparental inheritance
(3) Predetermination
(4) Dauermodification

46. Kappa particles were discovered by :-
(1) Correns (2) Sonneborn
(3) Rhoades (4) Bycott et.al.

47. Kappa particles make an animal killer when their number in an individual is :-
(1) 6 (2) 60
(3) 400 (4) 150

48. The killer chemical secreted by kappa particles is:-
(1) Secretin (2) Paramecin
(3) Plasmon (4) Poky

49. Which is not an example of cytoplasmic inheritance
(1) Female sterility in maize
(2) Sigma particle inheritance
(3) Kappa particle inheritance
(4) Plastid inheritance

50. Cytoplasmic male sterility is passed down :-
(1) Through bacteriophages
(2) Paternally
(3) Maternally
(4) Biparentally

51. The two eukaryotic organelles responsible for cytoplasmic inheritance are :-
(1) Lysosome & Mitocondria
(2) Chloroplasts & Lysosomes
(3) Mitochondria & chloroplasts
(4) Mitochondria & Golgi –complex

52. 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

53. Which of the following is the example of co-dominance
(2) Hbs Hbs, IA 1B (4) Hbs Hb5, IA IA
(1) HbA HbA, IA IB (3) HbA Hbs, IA IB

54. Hybridoma is :-

(1) Collection of DNA from DNA
(2) Collection of RNA from DNA
(3) A fusion of tumour sex cell with non tumour sex cell . ,
(4) A fusion of tumour somatic cell with non tumor somatic cell

55. When dominant and recessive alleles express itself together it is called :-
(1) Co-dominance (2) Dominance
(3) Amphidominance (4) Pseudo dominance

56. Extranuclear inheritance occurs in
(1) Killer Paramecium
(2) Killer Amoeba
(3) Euglena
(4) Hydra

57. Nucleus of a donor embryonal cell/somatic cell is transferred to an enucleated egg cell. Then after the formation of organism, what shell be true :
(1) Organism will have extranuclear genes of the donor cell.
(2) Organism will have extra nuclear genes of recipient cell.
(3) Organism will have extra nuclear genes of both donor and recipient cell.
(4) Organism will have nuclear genes of recipient cell.

58. Genes for cytoplasmic male sterility in plants are generally located in :-
(1) Chloroplast genome
(2) Mitochondria! genome
(3) Nuclear genome
(4) Cytosol

59. 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

60. The genes controlling the seven pea characters studied by Mendel are known to be located on how many different chromosomes :-
(1) Seven (2) Six
(3) Five (4) Four

61. 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 chloroplast

62. 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)

63. A test cross of f! flies +a/+b produced the following offspring
++/ab = 9
ab/ab = 9
+b/ab = 41
a+/ab = 41
What will be distance between linked gene :-
(1) 82 cm. (2) 18 cm. (cis)
(3) 20 cm. (4) 18 cm. (trans)

64. 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.

65. A sinistral shelled female snail having Dd genotype , cross with dextral shelled male having dd genotype. What type of shell will be present in the progeny
(1) All dextral
(2) All sinistral
(3) 0% dextral, 50% sinistral
(4) None

66. In female Drosophila the linked gene exhibit recombination during meiosis of gamete formation, but such a recombination does not occur during the formation of sperm in male Drosophila
(1) Male Drosophila is sterile
(2) Male Drosophila is parthenogenetic male
(3) No crossing over occur in male Drosophila
(4) Male Drosophila is haploid

67. Mendel observed the certain characters did not

assort independently. Later researches, found it to be due to :-
(1) Amitosis (2) Linkage
(3) Dominance WOO) , (4) Crossing –over

68. The phenomenon of incomplete dominance was observed by .-
(l) Devries (2)Correns
(3) Tschermak' (4) None

69. Genes for cytoplasmic male sterility in plants are generally located in -
(1) Nuclear genome
(2) Chloroplast genome
(3) Cytosol
(4) Mitochondria! Genome

70. Sickle cell anemia 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 of haemoglobin
(4) Caused by a change in a single base pair ofDNA

71. Study the pedigree chart given below :-
(1) Inheritance of a recessive sex-linked disease like haemophilia
(2) Inheritance of a sex-lined inborn errbr 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

72. 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 -de- luornui to noiaut A
(4) One antibody only - either anti-A or anti-B on the RBCs

73. Select the incorrect statement from the following:-
(1) Baldness is a sex-limited trait
(2) Linkage is an exception to the principle oindependent assortment in heredity
(3) Galactosemia is an inborn error of metabolism
(4) Small population size results in random genetic drift in a population

74. Which one of the following is commonly used in transfer of foreign DNA into crop plants ?
(1) Penicillium expansum
(2) Trichoderma harzianum
(3) Meloidogyme incognita
(4) Agrobacterium tumefaciens

75. The bacterium Bacillus thuringiensis is widely used in contemporary biology as :-
(1) Source of industrial enzyme
(2) Indicator of water pollution
(3) Insecticide
(4) Agent for production of dairy products

76. Polyethylene glycol method is used for it
(1) Energy production from sewage
(2) Gene transfer without a vector
(3) Biodiesel production
(4) Seedless fruit production

77. Transgenic plants are the ones :-
(1) Grown in artificial medium after hybridization ithe field
(2) Produced by a somatic embryo in artificialmedium
(3) Generated by introducing foreign DNA in to a cell and regenerating a plant from that cell
(4) Produced after protoplast fusion in artificial medium

78. What is true about Bt toxin ?
(1) The concerned Bacillus has antitoxins
(2) The inactive protoxin gets converted into active form in the insect gut
(3) Bt protein exists as active toxin in the Bacillus
(4) The activated toxin enters the ovaries of the pest to sterilise it and thus prevent its multiplication

79. The genetic defect - adenosine deaminase (ADA) deficiency may be cured permanently by
(1) Enzyme replacement therapy
(2) Periodic infusion of genetically engineered

lymphocytes having functional ADA cDNA
(3) Administering adenosine deaminase activators
(4) Introducing bone marrow cells producing ADA into cells at early embryonic stages

EXERCISE-2 ANSWER KEY

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