EXERCISE-1
History, Monohybrid Cross, Dihybrid Cross, Back

1. Germplasm concept was proposed by **[RPMT-93]**
(1) Mendel (2) De-vries
(3) Aristoltle (4) Weismann

2. The genetic information is carried by **[RPMT-93, 94]**
(1) Chromosome (2) Nucleic acid
(3) Gamete / Cells (4) Cytoplasm

3. On which plant mende0l had carried out his investigations **[RPMT-87, 88]**
(1) Garden – pea (2) Wild pea
(3) Cow-pea (4) Pigeon pea

4. Which of the following is non -heritable **[AIPMT-95]**
(1) Point mutation
(2) Chromosomal mutation
(3) Gene mutation
(4) Somatic mutation

5. The year 1900 AD is highly significant for geneticistsdue to the **[RPMT-92,95]**
(1) Discovery of genes
(2) Principle of Linkage
(3) Mendelian rediscovery
(4) Chromosome theory of heredity

6. During breeding the removal of anthers from a flower is called **[MP PMT-95]**
(1) Anthesis (2) Pollination
(3) Emasculation (4) Vasectomy

7. When a heterozygous tall pea plant of Fj generation upon self fertilization produces tall and dwarf phenotypes it proves the principle of **[RPMT-85, 90]**
(1) Dominance
(2) Segregation
(3) Independant assortement
(4) Inheritance & purity of gametes

8. Mendel formulated the law of purity of gametes onthe basis of **[RPMT-90]**
(1) Dihybrid cross
(2) Monohybrid cross
(3) Back cross
(4) Test cross

9. Mendelian monohybrid ratio is **[RPMT-93]**
(1)1:2:1 (2)3:1
(3)9:3:1 (4)9:3:4

10. In a monohybrid cross the genotypic ratio of the offspring is **[MP PMT-96]**
(1)3:1 (2)1:2:1
(3)1:1:1:1 (4)4:0

11. A cross between AaBB X aa BB yields a genotypicratio of **[AIPMT-90]**
(1) 1 AaBB: 1 aaBB
(2) 1 AaBB : 3 aaBB
(3) SAaBB : 1 aa BB
(4)AllAaBb

12. In monohybrid cross what is the ratio of homozygous dominant and homozygous recessive individuals in F2-generation **[RPMT-89-92-93-96]**
(1)1:2:1 (2)2:1/1:2
(3)3:1/1:3 (4)1:1

13. Back cross is a cross between **[RPMT-87]**
(1) F_1 x F_1 (2) F_1 xRecessive
(3) F_1 x Dominant (4) F_1 x any parent

14. The cross between recessive to it's hybrid or it's Fjplant is called **[RPMT-92, 93, 96]**
(1) Back cross (2) Test cross
(3) Monohybrid cross (4) Dihybrid cross

15. What is the genotypic and phenotypic ratio

of monohybrid test cross

[RPMT-96]

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

16. What is the ratio of a progeny of cross between Fjheterozygous and recessive :-
(1)3:1 (2)1:2:1
(3)1:1 (4)2:1

17. Dihybrid cross proves the law of :-
(1) Segregation
(2) Purity of gametes
(3) Dominance
(4) Independent assortment

18. 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

19. How many gametes are produced in F: generationof a trihybrid :-
(1) 3 (2) 4
(3) 8 (4) 16

20. Which genotype represents a true dihybrid condition
(1) tt rr (2) Tt rr
(3) Tt Rr (4) TT Rr

21. Mendel enunciated how many principles of inheritance :-
(l) One (2) Two
(3) Three (4) Four

22. 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

23. n a cross between a pure tall plant with green pod& a pure short plant with yellow pod. How manyshort plants are produced in F2 generation out of16 :-
(1) 1 (2) 3
(3) 4 (4) 9

24. In a dihybrid cross between AABB and aabb theratio of AABB, AABb, aaBb, aabb in F2generationis :-

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

25. Branch of biology dealing with heredity and variationis called :-
(1) Palaentolozy (2) Evolution
(3) Genetics (4) Ecolozy

26. A dihybrid ratio is :-
(1)1:1:1:1 (2)3:1
(3)9:3:3:1 (4) 9:5:1:1

27. AABbCc genotype forms how many types ofgametes :-
(1) 4 (2) 8
(3) 2 (4) 6

28. Who rediscovered the results of mendel's experiments :-
(1) Devries, Tschemark, correns
(2) Devries, Tschemark, Morgan
(3) Tschemark, Morgan, correns
(4) Tschemark, Bateson, Punnet,

29. Crossing AABB & aabb, the ratio of AaBb would be in F2 generation :-
(1)1/16 (2)2/16
(3) 8/16 (4) 4/16

30. On crossing red & white flowered plants the ratioof red and white flowered plants in F2-gen.was60:20, then on selfing the heterozygous redflowered plants, the offsprings would be :-

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

31. In mendel's experiments, colour of seed coat, natureof flower, position of flower, colour of pod, heightof stem, are called :-
(1) Alleles (2) Genotype
(3) Phenotype (4) All of the above

32. 120 Plants are produced on crossing pure red and pure white flowered pea plants, these ratio is:-

(1) 90 Red : 30 White
(2) 30 Red : 90 White
(3) 60 Red : 60 White
(4) All Red

33. According to Mendel's law of segregation the ratioof F2 generation is :-
(1) 1:2:1 (2) 3:1
(3) 1:1 (4) 2:1

34. Mendel worked in :-
(1)17th century (2)18th century
(3)19th century (4) 20th century

35. Pea plants were more suitable than cattle for Mendel's experiment because :-
(1) There were no breeding records of catties
(2) Pea plants can be self-fertilised
(3) Cattle are not easy to mantain
(4) All pea plants have 2X chromosomes and fewer genetic tr

36. An individual with two identical members of a pairof genetic factors is called :-
(1) Heteromorphic (2) Heterozygote
(3) Homomorphic (4) Homozygote

37. Two allelic genes are locatd on :
(1) The same chromosome
(2) Two homologlus chromosomes
(3) Two-non-homologous chromosomes
(4) Any two chromosomes

38. The percentage of ab gametes produced by Aa Bbparent will be
(1) 12.5 (2) 25
(3)50 (4)75

39. Gregor Mendel was born in :-
(1) Britain (2) Austria
(3) Russia (4) America

40. Mendel's principles are related to :-
(1) Evolution (2) Reproduction
(3) Variantions (4) Heredity

41. Different forms of a gene are called :-
(1) Heterozygotes
(2) Alleles
(3) Complementary genes
(4) Supplementary genes

42. How many character of pea pod were chosen by
mendel
(1) 7 (2) 2
(3) 4 (4) 3

43. Mendel chose character in pea :-
(1) Three (2) Two
(3) One (4) Seven

44. Mendel's law of segregation is based on separation
of alleles during :-
(1) Gemete formation
(2) Seed formation
(3) Pollination
(4) Embryonic development

45. In a cross 45 tall & 14 dwarf plants were obtained,
genotype of parents was :-
(l)TTXTT (2)TTXTt
(3) Tt X Tt (4) TT X tt

46. First geneticist was:-
(1)De vries (3)Darwin
(2) Mendel (4) Morgan

47. An organism with two identical alleles is :-
(1) Dominant (2) Hybrid
(3) heterozygous (4) Homozygous

48. Gametes of AaBb individual can be
(1) Aa, Bb (2) AB, ab
(3) AB, ab, aB (4) AB,Ab,aB,ab

49. Mendel did not propose :-
(1) Dominance
(2) Incomplete dominance
(3) Segregation
(4) Independent assortment

50. When two hybrids Ttrr & Rrtt are crossed, the phenotypic ratio of offspring shell be
(1)3:1 (2) 1:1:1:1
(3)1:1 (4) 9:3:3:

51. Body features are :-

(1) Phenotype
(2) Genotype
(3) Sex of individual
(4) Controlled by atmosphere

52. The allele which is unable to express its effect in the presence of another is called :-
(1) Co-dominant
(2) Supplementary
(3) Complementary
(4) Recessive

53 Genotype is :-
(1) Genetic composition of many organisms
(2) Genetic composition of plastids
(3) Genetic composition of germ cells
(4) Genetic composition of an individual

54. Who first proved that herdity is controlled by nucleus not by cytoplasm :-
(1) Hershay and chase
(2) Strassburger
(3) Hammerling
(4) Mendel

55. Mendelism is genetics of :-
(l)Haploids (2)Diploids
(3) Prokaryotes (4) All the above

56. Which technique is used by Mendel for hybridisation
(1) Emasculation '
(2) Bagging
(3) Protoplast fusion
(4) 1 & 2 both

57. The word "Genetics" coined by :-
(1) Mendel (2) Johannsen
(3) Bateson (4) morgan

58. Dihybrid plants form how many types of pollen grains :-
(l)One (2) Two
(3) Four (4) Eight

59. When flowers are unisexual then emasculation is done in :-
(1) Female (2) male
(3) 1 & 2 both (4) None of these

60. How many plants are dihybrid in F2 generation of dihybrid cross :-
(1) One (2) Two
(3) Four (4) Sixteen

61. Mendel's conclusion first published in :-
(1) Journal of plant breeding
(2) Journal of genetics & plant breeding
(3) Nature forschender verein
(4) None

62. When a plant have two alleles of contrasting characters it is called :-
(1) Homozygous (2) Dioecious
(3) Heterozygous (4) Monoecious

63. Phenotypic ratio 3:1 proves :-
(1) Dominance
(2) Segregation
(3) Crossing -over
(4)lndependent assortment

64. What is the ratio of one pair of contrasting characters in F2 of a dihybrid cross :-
(1)5:3 (2)3:1
(3)9:3:3:1 (4)1:2:2:4:1:2:1:2:1

65. What is ratio of homozygous and heterozygous individuals in F2 of a monohybrid cross :-
(1) 1:1 (2) 3:1
(3) 2:1 (4) 1:2

66. What is ratio of homozygous plants for both dominant characters in F2 of a dihybrid cross -.-
(1) 1/16 (2) 3/16
(3) 4/16 (4) 9/16

67. Which is Mendelian ratio :-
(1)3:1 (2)1:2:1
(3)1:1 (4)4:9:3:3:1

68. Which of the following is significance of dominance
(1) Organisms with dominant genes are more vita
(2) Harmful mutations are not expressed due to dominant gene
(3) Heterosis is due to dominant gene
(4) All the above

69. 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

70. From a single ear of corn, a farmer planted 200 kernels which produced 140 tall & 40 short plants. The genotypes of these offsprings are most likely -
(1) TT, Tt & tt (2) TT & tt
(3) TT & Tt (4) Tt & tt

71. A useful process for determining whether an individual is homozygous or heterozygous is :-
(1) Cross-breeding
(2) Self fertilization
(3) Back - crossing (4) Test cross

72. Genetic recombinations occur through :-
(1) Mitosis & Fertilisation
(2) Mitosis & Meiosis
(3) Meiosis & Fertilisation
(4) None of the above

73. Disease resistant varieties can be produced by -
(1) Crossing a plant with wild variety
(2) Treating with colchicine
(3) Crossing with hormones
(4) Treating with low temperature

74. 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%

75. A pure tall plant can be differentiated from a hybrid tall plant :
(1) By measuring length of plant
(2) By spraying gibberalins
(3) If all plants are tall after self-pollination
(4) If all plants are dwarf after self-pollination

76. Which of the following is the unit of inheritance
(1) Phenotype (2) Genotype
(3) Gene (4) None of these

77. If the cell of an organism heterozygous for two pairs of genes represented by Aa, Bb, undergoes meiosis, then the possible genotypic combination of gametes will be :-
(1) AB, Ab, aB, ab (2) AB, ab
(3) Aa, Bb (4) A, a, B, b

78. Allele is the :-
(1) Alternate trait of gene pair
(2) Total number of genes for a trait
(3) Total number of chromosomes of a haploid set
(4) Total number of genes present on a chromosome

79. Sex linkage first observed by :-
(1) Bateson (2) corrense
(3) Morgan (4) Muller

80. Types of genotypes in F2 generation of dihybrid cross :-
(1) 4 (2) 16
(3) 8 (4) 9

81. A character which is expressed in a hybrid is called
(1) Dominant (2) Recessive
(3) Co-dominan (4) Epistatic

82. Cross AABb X aaBb yields AaBB : AaBb : Aabbraabb 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

83. Genetic constitution of an individual is represented by:-
(1) Genome (2) Genotype
(3) Phenotyp (4) Karyotype

84. Genes do not occur in pairs in :-
(1) Zygote (2) Somatic cell
(3) Endosperm cell (4) Gametes

85. "Like begets like" an important and universal phenomenon of life, is due to :-
(1) Eugenics (2) Inheritance
(3) dominance (4) Crossing-over

86. The genes for same trait present on non-homologous chromosomes are :-
(1) Alleles (2) Linked genes
(3) Multiple alleles (4) None of these

87. Genotype - phenotype concept was first

produced by:-
(1) Bateson
(2)Johannsen
(3) Sutton & Boveri
(4) Punnet

88. How many types of gametes are expected from the organism with genotype AABBCC:-
(l) One (2) Two
(3) Four (4) Eight

89. 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

90. The scientist who worked on garden pea before mendel was :-
(1) Goss (2) Kolreuter
(3) Bateson (4) Maupertius

91. The plant which made Hugo -de vries famous is
(1) Antirrhinum majas
(2) Lathyrus odoratus
(3) Oenathera lamarckiana
(4) Pisum sativum

92. If 3" is the theoretically possible number of different genotypes (when n = the number of chromosome pairs with each carrying one pairs of heterozygous alleles), the different genotypes produced by pea plant is :-
(1) 310 (2) 312
(3) 314 (4) 3793.

93 Male gemetes Female gametes In the Punnet square given above, the genotype of the female parent and male parents respectively:-

?	AB	Ab	aB	ab
	AaBB	AaBb	aaBB	aaBb

(1) AABB, AaBb (2) AaBB, AaBb
(3) aaBB, AaBb (4) AAbb, AaBb

94. 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

95. According to mendelism which character is showing dominance-
(1) Terminal position of flower
(2) Green colour in seed coat
(3) Wrinkled seeds
(4) Green pod colour

96. Due to the cross between TTRr xttrr the resultant
progenies showed how many percent plants would
be, tall, red flowered :-
(1) 50% (3) 25%
(2) 75% (4) 100%

97 Irregularity is found in Drosophila during the organ differentiation for example- inplace of wing, long legs are formed. Which gene is responsible for :-
(1) Double dominant gene
(2) Homeiotic gene
(3) Complimentary gene
(4) Plastid

98. Mendel obtained wrinkled seeds in pea due to deposition of sugars instead of starch. It was due to which enzyme :-
(1) Amylase
(2) Invertase
(3) Diastase
(4) Absence of starch branching enzyme

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

100. A plant of Fj-generation with genotype "AABbCC". On selfing of this plant what is the phenotypic ratio in F2-generation :-
(1) 3 : 1
(2) 1 : 1

(3) 9 : 3 : 3 : 1
(4) 27 : 9 : 9 : 9 : 3 : 3 : 3 : 1

101. 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

102. 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 rrtt
(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

103. 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

104. How is the arrangement of Mendel's selected seven characters on four chromosomes :-
(1) One in ch. no. 1, 4 in ch. no. 4, one in ch. no. 5, and one in ch. no. 7
(2) 2 in ch. no. 1,3 in ch. no. 4, one in ch. no. 5 and one in ch. no. 6
(3) 3 in ch. no. 1, 1 in ch. no. 4, 2 in ch. no. 5 and one in ch. no. 7
(4) 2 in ch. no. 1,3 in ch. no. 4, 1 in ch. no. 5 and 1 in ch. no. 7

105. Out of three characters on chromosome no. 4, two characters indicate linkage and not entioned by Mendel. These characters were -
(1)Pod form - stem length
(2)Pod form - pod position
(3)Pod form - pod colour
(4)Pod position - stem length

106. Mrs. verma has a autosomal gene pair 'Bb' and she contain x-linked gene 'd'. 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%

107. When two different genotypes produce the same phenotype due to environmental difference, then each one is known as :-
(1) Phenotype (2) Phenocopy
,
(3) Progeny (4) Independent offspring

108. 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

109. When a red flower homozygous pea plant is crossedwith a white flower plant what colour is producedin Fj :-
(l) Red (2) White
(3) Pink (4) Red + white

110. 1:1:1:1 ratio shows :-
(1) Monohybrid cross
(2) Dihybrid cross
(3) Back cross
(4) Dihybrid test cross

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

112. 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

113. 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 it's 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%

114. In rabbit black skin (B) is dominant over brown skin (b) and short hair (S) is dominant over long hair (s). If homozygous black-short haired male is crossed with a homozygous brown-long haired female. All Fj-off spring are heterozygous black-short haired. Fj male crossed with F,-female. In F2 generation what is the percentage of homozygous black-short haired offspring :-
(1) 50% (2) 12.5%
(3) 6.25% (4) 18.75%

115. How many different types of gametes can be formedby Fj progeny, resulting from the following crossAA BB CC x aa bb cc
(1) 3 (2) 8
(3) 27 (4) 64

116. In order to find out the different types of gametes produced by a pea plant having the genotype AaBb, it should be crossed to a plant with the genotype
(1) AaBb (2) aabb
(3) AABB (4) aaBB

117. Gene word was coined by :-
(1) Mendel (2) Hugo-de-vries
(3) Morgan (4) Johanson

118. Discoverer of incomplete dominence :-
(1) Von Tschermak (2) Carl correns
(3) Hugo-de-vries (4) None of the above

119. est cross is :-
(l) Tt xTt (2) Tt xTT
(3) TTxTT (4) Tt xtt

120. Law of independent assortment of mendel was proved by :-
(1) Monohybrid cross (2) Test cros
(3) Dihybrid cross (4) Back cross

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

EXERCISE-1 ANSWER KEY

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