

**Choose the correct answers :**

1. In sweet pea, genes C and P are necessary for colours in flower. The flowers are white in absence of either or both the genes. What will be the percentage of heterozygous coloured flowers in the offspring of CcPp and CcPp ?  
(1) 25%                      (2) 50%  
(3) 75%                      (4) 100%
2. If 7 alleles of a gene regulate a character, then what will be total number of genotypes ?  
(1) 7                          (2) 18  
(3) 28                        (4) 14
3. If gene at one locus is lethal and gene at other locus follows law of dominance, then F<sub>2</sub> phenotypic ratio will be  
(1) 4 : 2 : 2 : 1              (2) 2 : 4 : 2 : 1 : 2 : 1  
(3) 6 : 3 : 2 : 1              (4) 9 : 3 : 3 : 1
4. Total number of phenotype and genotype in the cross AaBbCcDDEe × AaBbCcDDEe will be  
(1) 35                        (2) 97  
(3) 16                        (4) 20
5. Genotype-phenotype concept was given by  
(1) Johanson                (2) Darwin  
(3) Mendel                  (4) Bateson
6. A cross between a plant heterozygous for two factors and a plant recessive for both the factors, gives a phenotypic ratio of  
(1) 9 : 1 : 1 : 7              (2) 9 : 3 : 3 : 1  
(3) 1 : 1 : 1 : 1              (4) 1 : 7 : 7 : 1
7. 'X' represents  
(1) Gametic number  
(2) Basic chromosome number  
(3) Haploid number  
(4) All of the above
8. First exception of Mendel's law of independent assortment was given by  
(1) T. H. Morgan  
(2) Correns  
(3) Bateson and Punnett  
(4) Hugo de Vries
9. The phenotypic ratio of a trihybrid cross will be  
(1) 27 : 9 : 9 : 9 : 3 : 3 : 3 : 1  
(2) 9 : 3 : 3 : 1  
(3) 27 : 3 : 3 : 9 : 9 : 1  
(4) 3 : 1
10. Phenocopies are the individuals of  
(1) Different genotype but same phenotype  
(2) Same genotype and same phenotype  
(3) Same genotype but different phenotype  
(4) None of these
11. Pattern baldness, moustaches and beard in human males are example of  
(1) Sex linked traits  
(2) Sex differentiating traits  
(3) Sex limited traits  
(4) Sex determining
12. Variations (changes) in the size, shape, colour or structure of an animal or in its parts are due to  
(1) Meristic variations  
(2) Blastogenic variations  
(3) Continuous variations  
(4) Substantive variations
13. A clone is a collection of genetically  
(1) Identical individuals obtained by vegetative reproduction  
(2) Identical individuals produced by sexual reproduction  
(3) Different individuals produced by sexual reproduction  
(4) Gene pool
14. If seeds are grown in dark, leaves will be yellow though genes for green colour of leaves are present. This effect of environment on the expression of gene was studied by Gold Schmidt. It is called  
(1) Phenocopy              (2) Genecology  
(3) Genology                (4) Pleiotropy
15. Heterozygosity protects ..... from natural selection  
(1) Recessive alleles (2) Dominant alleles  
(3) Multiple factors (4) Genomes
16. The theory of Pangenesis of Darwin was discarded by continuity of germplasm theory that was proposed by  
(1) Lamarck                (2) Weismann  
(3) Darwin                 (4) Kolreuter
17. The genetic concept of segregation and independent assortment are most likely to be associated with  
(1) Mitosis and meiosis  
(2) Meiosis and fertilization  
(3) Meiosis and reproduction  
(4) Mitosis and cleavage

18. How many possible genotypes are there for the ABO blood groups ?  
 (1) 4 (2) 6  
 (3) 8 (4) 16
19. The genotypic expression seen in a person of blood group is called  
 (1) Dominant – recessive  
 (2) Codominance  
 (3) Incomplete dominance  
 (4) More than one of the above
20. Which of the following crosses will give monohybrid ratio of 3 : 1 in progeny  
 (1) AaBb × AaBb (2) aabb × AABB  
 (3) Aabb × Aabb (4) aaBb × aabb
21. A diploid in which only one allele of a pair is present is known as  
 (1) Homozygous (2) Hemizygous  
 (3) Heterozygous (4) Incomplete dominance
22. A dwarf pea plant was treated with gibberellic acid. It grew as a pure tall pea plant. If this treated plant is crossed with a pure tall plant, then the phenotypic ratio of F<sub>2</sub> is likely to be  
 (1) All tall  
 (2) 50% tall : 50% dwarf  
 (3) 75% tall : 25% dwarf  
 (4) All dwarf
23. Imagine that in a pea plants the factor for controlling seed coat colour and shape of seeds are present on the same chromosome very close together. Performing dihybrid experiments with these characters, Mendel would not have been able to arrive at the idea of  
 (1) Dominance  
 (2) Independent assortment  
 (3) Incomplete dominance  
 (4) Segregation
24. A pair of roan cattle were mated. Roan, white and red offspring were produced. The roan parents were most likely  
 (1) Mutants for coat colour  
 (2) Hybrid for coat colour  
 (3) Pure dominant for coat colour  
 (4) Pure recessive for coat colour
25. The best method for determining whether an individual is homozygous or heterozygous is  
 (1) Inbreeding (2) Cross-breeding  
 (3) Test-crossing (4) Self fertilization
26. Multiple alleles are present  
 (1) At the same loci in homologous chromosomes  
 (2) At different loci in the homologous chromosome  
 (3) At the same loci in non-homologous chromosome  
 (4) At different loci in non-homologous chromosomes
27. If two opposite alleles come closer together, one of the two finds morphological expression masking other in the body of the organism. This fact is described as  
 (1) Law of inheritance  
 (2) Law of dominance  
 (3) Law of limiting factors  
 (4) Law of segregation
28. In Mendelian genetics one of the following character is the dominant  
 (1) Green colour of pods  
 (2) Green colour of seeds  
 (3) Terminal flowers  
 (4) Wrinkled seeds
29. Mendel published his experimental works under the caption  
 (1) Experiments on Pea plants  
 (2) Hybridization of Pea plants  
 (3) Laws of Inheritance  
 (4) None of the above
30. Exchange of chromosome segments between maternal and paternal chromatids during meiosis is called  
 (1) Linkage (2) Crossing over  
 (3) Chiasmata (4) Dominance
31. The universal donor of blood is  
 (1) A group (2) AB group  
 (3) B group (4) O group
32. In the experiments, conducted by Mendel, one of the following features was universally found :  
 (1) Codominant (2) Dominant-recessive  
 (3) Epistasis (4) Incompletely dominant
33. Blixt could work out that Mendelian seven pairs of characters were actually not present on seven pairs of chromosomes, as it was believed earlier. Now the number of chromosomes involved are only  
 (1) 2 (2) 4  
 (3) 5 (4) 6
34. Blixt (1975) found that chromosomes of Pea plants, which are actually involved for Mendelian seven pairs of characters are  
 (1) 1<sup>st</sup>, 3<sup>rd</sup>, 4<sup>th</sup> & 7<sup>th</sup> (2) 2<sup>nd</sup>, 4<sup>th</sup>, 5<sup>th</sup> & 7<sup>th</sup>  
 (3) 1<sup>st</sup>, 4<sup>th</sup>, 5<sup>th</sup> & 7<sup>th</sup> (4) 1<sup>st</sup>, 3<sup>rd</sup>, 5<sup>th</sup> & 7<sup>th</sup>

35. The gene for baldness is dominant in men but exhibits recessiveness in woman. The difference in expression results from
- (1) The gene for baldness being X-linked
  - (2) The gene for baldness being Y-linked
  - (3) The expression of the gene depending upon the hormonal balance of the individual
  - (4) None of these
36. For two traits, the phenotypic ratio in haploid organism is
- (1) 2 : 1 : 2 : 1
  - (2) 9 : 3 : 3 : 1
  - (3) 1 : 1 : 1 : 1
  - (4) 1 : 2 : 1
37. Mendel's law of independent assortment states
- (1) One pair of factors may influence another pair
  - (2) One pair of factors has no influence on another pair
  - (3) One pair of factors segregate but it is dependent upon that of another pair
  - (4) One pair of factors segregate but it is independent to that of another pair
38. Pleiotropic gene is one which
- (1) Controls a character of a human being only
  - (2) Controls a character of a plant only
  - (3) Controls one character in association with other genes
  - (4) Controls more than one character
39. Polymorphism in an organism is due to
- (1) Monogenic inheritance
  - (2) Polygenic inheritance
  - (3) Both of these
  - (4) None of these
40. Which of the following is the correct set of chromosomes carrying the correct number of Mendelian characters
- (1) 1<sup>st</sup> - 2, 4<sup>th</sup> - 2, 5<sup>th</sup> - 1, 7<sup>th</sup> - 2
  - (2) 2<sup>nd</sup> - 1, 4<sup>th</sup> - 3, 6<sup>th</sup> - 2, 7<sup>th</sup> - 1
  - (3) 1<sup>st</sup> - 1, 3<sup>rd</sup> - 1, 5<sup>th</sup> - 3, 7<sup>th</sup> - 2
  - (4) 1<sup>st</sup> - 2, 4<sup>th</sup> - 3, 5<sup>th</sup> - 1, 7<sup>th</sup> - 1
41. The work of Mendel was not recognized in his life time because
- (1) Mendel was ahead of his time
  - (2) Mendel published his results in an obscure journal
  - (3) The scientists of that time were busy with Darwinism
  - (4) All the above
42. In a cross between AaBb × AaBb, the ratio of recombinant : parental is
- (1) 9 : 7
  - (2) 10 : 6
  - (3) 6 : 10
  - (4) 12 : 4
43. Reciprocal cross is
- (1) Intraspecific hybridization
  - (2) Back cross
  - (3) Pollen grains from one variety deposited on the stigma of the contrasting variety and vice versa in hybridization experiments
  - (4) Test cross
44. If in a dihybrid cross Mendel had used two linked characters, he would have faced difficulty in explaining the results on the basis of his
- (1) Law of segregation
  - (2) Law of multiple factor hypothesis
  - (3) Law of independent assortment
  - (4) Law of dominance
45. How many different kinds of gametes are produced by an organism with genotype AaBbCc
- (1) 4
  - (2) 8
  - (3) 16
  - (4) 64
46. Small unstable variations which fluctuate on either side of an average condition are known as
- (1) Continuous
  - (2) Discontinuous
  - (3) Blastogenic
  - (4) Germinal
47. Heterozygosity protects \_\_\_\_\_ from natural selection
- (1) Recessive alleles
  - (2) Dominant alleles
  - (3) Multiple factors
  - (4) Genomes
48. Mendel failed to produce same results in plants like
- (1) *Hieracium* (Hawk weed)
  - (2) Bean (*Phaseolus*)
  - (3) Both (1) and (2)
  - (4) None of the above
49. Heterozygous organisms *Bb* produce *B* and *b* gametes. The chances of *b* combining with *B* or *b* are
- (1)  $\frac{1}{2}$
  - (2)  $\frac{1}{1}$
  - (3)  $\frac{1}{4}$
  - (4) None of these
50. If the number of heterozygous gene pairs involved in a particular cross is three, the phenotypic ratio obtained in their F<sub>2</sub> generation will be
- (1) 9 : 3 : 3 : 1
  - (2) 27 : 9 : 9 : 9 : 3 : 3 : 3 : 1
  - (3) 27 : 9 : 9 : 6 : 6 : 3 : 3 : 1
  - (4) 1 : 2 : 1 : 2 : 4 : 2 : 1 : 2 : 1

51. Which of the following statements is true about Mendel's law ?  
 (1) It takes place in sexually reproducing plants  
 (2) It takes place in asexually reproducing plants  
 (3) It takes place in both sexually and asexually reproducing plants  
 (4) It takes place in apomictically reproducing plants
52. The term allelomorphs implies  
 (1) Any two characters  
 (2) A pair of contrasting characters  
 (3) Sex linked characters  
 (4) A pair of non-contrasting characters
53. Emasculation is related to  
 (1) Pure line  
 (2) Mass selection  
 (3) Clonal selection  
 (4) Hybridisation
54. Gynandromorph is a condition in which the body of an individual exhibits  
 (1) Only female characters  
 (2) Only male characters  
 (3) Male and female character both  
 (4) Either male or female characters
55. The process by which frequency of crossing over is increased is called  
 (1) Coincidence (2) Interference  
 (3) Cross over (4) Terminalization
56. Which of the following is the correct sequence of genes on the chromosome with following data :  
 The cross over percentage between a & b = 8 ; b & c = 10, b & d = 22, c & e = 30, e & d = 2, a & e = 12  
 (1) a e c b d (2) d e a b c  
 (3) e d b a c (4) b e a c d
57. Parental combination in coupling and repulsion can be expressed as
- | Coupling        | Repulsion   |
|-----------------|-------------|
| (1) AABB × aabb | AABB × AAbb |
| (2) aaBB × aabb | AAbb × aabb |
| (3) AABB × aabb | AAbb × aaBB |
| (4) AAbb × aaBB | AaBb × aabb |
58. When two genes are situated very close to each other in a chromosome ?  
 (1) The percentage of crossing over between them is very high  
 (2) Hardly any crossovers are detected  
 (3) No crossing over can ever take place between them  
 (4) Only double cross overs can take place between them
59. The process by which sex is determined at the time of fertilization is known :  
 (1) Epigamic (2) Progametic  
 (3) Syngamic (4) None of these
60. For the preparation of genetic maps, the recombination frequencies between genes are additive over short distances but not over long distances, due to  
 (1) Epistasis (2) Synaptonemal complex  
 (3) Lethal mutation (4) Multiple crossover
61. The glucose-6-phosphate dehydrogenase deficiency  
 (1) X-linked recessive gene  
 (2) Y-linked gene  
 (3) X-linked dominant gene  
 (4) Y-linked dominant gene
62. An individual with half body male and half body female is known as  
 (1) Sterile (2) Free martin  
 (3) Inter sex (4) Gynandromorph
63. Pseudodominance is expression of  
 (1) Recessive gene by inactivating dominant gene  
 (2) Neither dominant nor recessive gene  
 (3) Both dominant and recessive genes  
 (4) Recessive gene due to deletion of dominant gene
64. The change of chromosomal parts between non-homologous pairs of chromosomes is known as  
 (1) Inversion (2) Translocation  
 (3) Deletion (4) Crossing-over
65. A gamete normally contains  
 (1) Many alleles of a gene  
 (2) All alleles of a gene  
 (3) Two alleles of a gene  
 (4) One allele of a gene
66. Genetic map of *Drosophila* was prepared by  
 (1) Muller (2) Morgan  
 (3) Sturtevant (4) Pontecarvo
67. Criss cross inheritance means  
 (1) X chromosome from male will pass to a male of next generation  
 (2) X chromosome from a male will pass to a female of next generation  
 (3) X chromosome from female will pass to female of next generation  
 (4) None of the above
68. The unfertilized eggs in honeybee develop into  
 (1) Female worker  
 (2) Drone (Male worker)  
 (3) Both (1) and (2)  
 (4) None of these

69. In humans an example of a sex-linked trait is
- (1) Curly hair
  - (2) Sickle-cell anemia
  - (3) Colour blindness
  - (4) Down's syndrome
70. A purple-flowered plant is cross-pollinated with a yellow-flowered plant of the same species. The hybrid is all yellow-flowered. If one of the yellow-flowered F<sub>1</sub> plant is cross-pollinated with a purple-flowered plant, approximately what percent of the offsprings would be expected to have purple flowers
- (1) 25%
  - (2) 50%
  - (3) 75%
  - (4) 100%
71. Who discovered Y-chromosome ?
- (1) Bridges
  - (2) Barr and Bertram
  - (3) Lillie
  - (4) Stevens
72. Cis-trans experiment is related with
- (1) Heredity
  - (2) Mutation
  - (3) Genetic map
  - (4) Crossing over
73. The theory that genes are linearly present as well as closer the genes on the chromosomes, stronger would be the linkage, was envisaged by
- (1) Bateson and Punnett
  - (2) Morgan
  - (3) Bateson, Punnett and Morgan
  - (4) Morgan and Sturtevant
74. The sex-determining chromosome in human beings is
- (1) X chromosome
  - (2) Y chromosome
  - (3) Ratio of X and Y chromosomes
  - (4) Ratio of X chromosome and Autosome
75. Grasshoppers have one of the following types of sex determining system
- (1) XX – XY system
  - (2) ZZ – ZW system
  - (3) XX – XO system
  - (4) Ploidy level system
76. The segment of a DNA which participates in crossing over is known as
- (1) Recon
  - (2) Muton
  - (3) Cistron
  - (4) Replicon
77. Criss cross inheritance in *Drosophila* led to the discovery of
- (1) Law of independent assortment
  - (2) Extra chromosomal inheritance
  - (3) Lethal genes
  - (4) Sex-linked inheritance
78. Which one of the following is the organism in which linkage map was first constructed ?
- (1) *Drosophila*
  - (2) *Oenothera*
  - (3) *Pisum sativum*
  - (4) *Neurospora*
79. Female homogameity is observed in
- (1) Grasshopper
  - (2) *Drosophila*
  - (3) Man
  - (4) All of these
80. In *Neurospora* ascus, 8 ascospores show 2A, 4A, 2a arrangement. It suggests
- (1) No crossing over between genes
  - (2) I division segregation
  - (3) II division segregation
  - (4) Crossing over between gene and centromere
81. *Neurospora* is widely used in genetical studies. All of the following characteristics about *Neurospora* are correct except that
- (1) They can be easily cultured in laboratory
  - (2) Being cultured their recessive genes can express themselves
  - (3) They have short life cycle of about ten days
  - (4) Their spores are unaffected by radiation
82. Suppose that out of 1000 offsprings in the F<sub>2</sub> generation of a dihybrid cross 748 are tall and hairy, 6 are tall and smooth, 4 are short and hairy and 242 are short and smooth. what is the explanation for this kind of ratio?
- (1) Presence of lethal genes
  - (2) Presence of multiple alleles
  - (3) Linkage and crossing over
  - (4) Sex linkage
83. Albinism in corn plants is best described as
- (1) Lethal
  - (2) Sex-linked
  - (3) Inbred
  - (4) Dominance
84. The percentage of recombinants in a cross in which the parents types of offspring are 410 and 390 and the recombinants are 24 and 26 is
- (1) 2.8%
  - (2) 5.8%
  - (3) 16.4%
  - (4) 25%
85. When a red eyed female *Drosophila* is crossed with a white eyed male the phenotype of progeny in the F<sub>1</sub> generation will be
- (1) 3 red and 1 white eyed
  - (2) 1 red, 2 pink and 1 white eyed
  - (3) All red eyed
  - (4) All white eyed
86. The chief advantage of the linear arrangement of the ascospores in *Neurospora* is that in genetic studies it permits



- (1) Accurate counting of spores  
 (2) Easy collection of ascospores  
 (3) Easy inference of the orientation of chromatids during meiosis  
 (4) Ready observation of mutant phenotypes
87. In *Neurospora* ascus, which one of the following is a fact ?
- (1) The number of recombinants is directly proportional to the distance of gene from its centromere  
 (2) The number of recombinants bears no relation to the distance of the gene from its centromere  
 (3) Recombination and complementation determine the distance of gene from its centromere  
 (4) Not recombination but complementation determines the distance of gene from its centromere
88. The somatic chromosome complement in all human being is
- (1) 22 pairs of autosomes and one heterosome  
 (2) 22 pairs of autosomes and two pairs of heterosome  
 (3) 22 pairs of autosomes and one pair of heterosome  
 (4) 22 pairs of autosomes and one pair of XY heterosome
89. In a linear chromosome, map distance between four loci are follows :  $a-b = 10$ ,  $b-c = 4$ ,  $a-d = 3$ ,  $a-c = 6$   
 The cross over frequency between c and d is
- (1) 1%  
 (2) 9%  
 (3) 4% to 12%  
 (4) Either 3% or 9%
90. An individual homozygous for genes cd is crossed with wild type and the  $F_1$  crossed back with the double recessive. The appearance of the offspring is as follows
- |    |             |
|----|-------------|
| ++ | 903         |
| cd | 897         |
| +d | 98          |
| c+ | <u>102</u>  |
|    | <u>2000</u> |
- The distance between the genes c and d is
- (1) 20 map units    (2) 9.8 map units  
 (3) 10.2 map units    (4) 10 map units

91. In rabbits two recessive genes produce a solid body colour and long hair in contrast to a spotted body colour and short hair which result from the dominant alleles. The results from a cross between heterozygous spotted, short haired rabbits and solid, long haired rabbits are as follows
- |                |            |
|----------------|------------|
| Spotted, short | 48         |
| Spotted, long  | 5          |
| Solid, short   | 7          |
| Solid, long    | 40         |
|                | <u>100</u> |
- What will be the linkage map between the two genes?
- (1) 5 map                      (2) 7 map  
 (3) 12 map                    (4) 50 map
92. In a cross in *Drosophila*, the heterozygous animal with grey body and long wings is crossed with *Drosophila* with black body and vestigial wings, the progeny has the animals in the following ratio : grey vestigial 24, grey long 126; black long; 26; black vestigial 124. What is the frequency of recombinants in the population ?
- (1) 15.8                      (2) 16.7  
 (3) 17.5                      (4) 14.5
93. In a typical Mendelian cross the  $F_1$  generation gives genotype "AaBB". What will be the possible genetic combination of the parents ?
- (1) AABB and aabb  
 (2) AAbb and AAbb  
 (3) AABB and AaBb  
 (4) aaBB and aaBB
94. A dihybrid test cross ratio for two linked genes in a hybrid is
- (1) 1 : 1                      (2) 1 : 1 : 1 : 1  
 (3) 7 : 1 : 1 : 7              (4) 1 : 7 : 7 : 1
95. The inheritance of blood groups in man shows
- (1) Quantitative character  
 (2) Qualitative character  
 (3) Multiple alleles  
 (4) Polygenic traits
96. In incomplete dominance
- (1) The phenotypic and genotypic ratios are the same in the  $F_1$ , population  
 (2) The phenotypic ratio and genotypic population show the same ratio in the  $F_2$  population  
 (3) The phenotypic ratio and genotypic population show different ratios in the  $F_1$  population  
 (4) The phenotypic and genotypic ratios show difference in the  $F_2$  population

97. The genes that keep on changing their location in chromosomes are  
 (1) Jumping genes (2) Pleiotrophic genes  
 (3) Split genes (4) Duplicate genes
98. The first plant in which chromosomal basis of sex determination was discovered is  
 (1) *Melandrium* (2) *Rumex*  
 (3) *Coccinia* (4) *Sphaerocarpus*
99. Kappa particles indicate  
 (1) Nuclear inheritance  
 (2) Cytoplasmic inheritance  
 (3) Mutation  
 (4) Nucleo-cytoplasmic inheritance
100. Holandric genes are  
 (1) Carried by 'X' chromosomes  
 (2) Carried by different parts of 'Y' chromosomes  
 (3) Carried by 'X' and 'Y' chromosomes  
 (4) Carried by autosomes
101. What are allosomes ?  
 (1) Granular structure on chromosomes  
 (2) Node like structure on chromosomes  
 (3) Sex chromosomes  
 (4) None of these
102. When hereditary trait is controlled by one gene that has two alternative forms, it is called  
 (1) Monogenic trait  
 (2) Qualitative trait  
 (3) Both (1) and (2)  
 (4) Quantitative trait
103. ZO – ZZ type of sex determination is  
 (1) Opposite of XX – XO type  
 (2) Opposite of XX – XY  
 (3) Opposite of ZZ – ZW type  
 (4) Gynander
104. Unit of distance between genes in a chromosome is known as  
 (1) C – DNA (2) Morgan  
 (3) Centimorgan (4) Spacer
105. The number of linkage groups in man is  
 (1) 23 (2) 46  
 (3) 24 (4) 45
106. Increase in age decreases  
 (1) Crossing over (2) Linkage  
 (3) Polyploidy (4) Mutations
107. An animal where the male has half the number of chromosomes as compared to the female is  
 (1) Honey Bee (2) *Amoeba*  
 (3) Chicken (4) Geometrid Moth
108. A linkage group is defined as  
 (1) All the linked genes of a chromosomal pair  
 (2) Different groups of genes present on different chromosome  
 (3) All the genes located on the same chromosome  
 (4) None of these
109. Complete linkage is found in  
 (1) Birds  
 (2) Snakes  
 (3) Female *Drosophila*  
 (4) Male *Drosophila*
110. When a trihybrid mulatto is self crossed. What will be the percentage of mulattoes in resulting progeny ?  
 (1) 12.5% (2) 25%  
 (3) 50% (4) 20%
111. Lethal factors were reported in plants by  
 (1) Cuenot (2) Baur  
 (3) Bateson (4) Morgan
112. In polygenic inheritance, the parents fall into two distinct classes but F<sub>1</sub> generation shows intermediate characters because of  
 (1) Dilution of dominant gene  
 (2) Dilution of recessive gene  
 (3) Excess of recessive gene  
 (4) None of these
113. Example of polygenic inheritance is  
 (1) Cob length in corn (2) Kernel color in wheat  
 (3) Skin color in man (4) All of these
114. Development of purple flower character when two white flower strains of Sweet Pea are crossed, is an example of  
 (1) Multiple factor inheritance  
 (2) Multiple allele inheritance  
 (3) Supplementary gene interaction  
 (4) Complementary gene interaction
115. It is easier to study polygenic inheritance of character in the plants than in animals because in plants  
 (1) Matings can be controlled and large number of offspring are produced  
 (2) Matings can not be controlled and large number of offspring are produced  
 (3) Matings can be controlled and a small number of offspring are produced  
 (4) Matings can not be controlled and a small number of offspring are produced

116. Select the statement which is not correct?
- (1) Polygenic character is controlled by multiple alleles
  - (2) In case of polygenic inheritance several intermediate phenotypes are found between two extreme ones
  - (3) Height, skin colour and intelligence of human are example of inheritance polygenic
  - (4) Polygenic character is controlled by a pair of genes
117. The ratio of lethal gene is
- (1) 3 : 1
  - (2) 1 : 2 : 1
  - (3) 2 : 1
  - (4) 1 : 1
118. The supplementary gene design interactions segregate into
- (1) 15 : 1
  - (2) 12 : 3 : 1
  - (3) 9 : 6 : 1
  - (4) 9 : 3 : 4
119. Quantitative trait would be characterised by
- (1) Extreme phenotypes in homozygous condition
  - (2) Grades of phenotypes in heterozygous condition
  - (3) Both of these
  - (4) None of these
120. An interaction between non-allelic genes in which an allele at one locus prevents expression of an allele at another locus but not versa, is called
- (1) Collaboration
  - (2) Complementation
  - (3) Epistasis
  - (4) Modification
121. Genes that are similar in phenotypic effect when present separately, but together interact to produce a different trait giving a ratio of 9 : 7 in the F<sub>2</sub> generation. What are such genes known as ?
- (1) Hypostatic gene
  - (2) Supplementary genes
  - (3) Epistatic gene
  - (4) Complementary genes
122. Experimental evidence for polygenic inheritance was first obtained by
- (1) Galton
  - (2) Malthus
  - (3) Nilsson-Ehle
  - (4) None of these
123. Inheritance of skin colour is an example of
- (1) Monogenic inheritance
  - (2) Mendelian inheritance
  - (3) Polygenic inheritance
  - (4) Complementary genes
124. Polygene shows :
- (1) Different phenotypes
  - (2) Different genotypes
  - (3) Both (1) and (2)
  - (4) Neither phenotypes nor genotypes
125. The result to know the types of phenotypic progenies in case of polygenic inheritance can be calculated by
- (1)  $\frac{n(n-1)}{2}$
  - (2)  $\frac{n(n+1)}{2}$
  - (3)  $2^n + 1$
  - (4)  $2n + 1$
126. Epistasis implies that
- (1) One pair of genes can independently mask the expression of another pair of genes
  - (2) One pair of genes independently controls a particular phenotype
  - (3) One pair of genes enhances the phenotypic expression of another pair of genes
  - (4) Many genes collectively control a particular phenotype
127. Polygenic inheritance is on account of
- (1) One gene controlling several characters
  - (2) One gene controlling one character
  - (3) Additive action of several genes on one character
  - (4) None of these
128. Epistasis is a phenomenon where interacting genes are
- (1) Inter-allelic
  - (2) Intra-allelic
  - (3) Inter-genic
  - (4) Intra-genic
129. 12 : 3 : 1 ratio is due to which type of gene interaction
- (1) Dominant epistasis
  - (2) Recessive epistasis
  - (3) Supplementary gene interaction
  - (4) Complementary gene interaction
130. Polygenic inheritance in plants like tobacco was first studied by
- (1) Davenport
  - (2) Nilsson-Ehle
  - (3) Kolreuter
  - (4) Galton
131. In which of the following type of inheritance only the dominant alleles are contributing alleles
- (1) Quantitative inheritance
  - (2) Monogenic inheritance
  - (3) Qualitative inheritance
  - (4) All of these
132. An embryo resulting from the mating of two albino rabbits is transplanted into the uterus of a brown rabbit. The phenotype of this transplant will most probably be
- (1) White
  - (2) Brown with white spots
  - (3) White with Brown spots
  - (4) Brown



133. Studies of inheritance of mouse body colour reveals lethal genes. Where the yellow body colour of mice is controlled by a dominant gene (Y) but the yellow mice are never true breeding. What will be the phenotypic ratio of the offsprings produced when a cross is made between two yellow mice (Yy), if gene 'y' produces black colour in homozygous condition
- (1) 3 yellow : 1 black
  - (2) 2 yellow : 1 black
  - (3) 2 yellow : 2 black
  - (4) 1 yellow : 1 black
134. An infertile plant hybrid can be made fertile by
- (1) Colchicine treatment
  - (2) Polyploidy
  - (3) Granoson treatment
  - (4) All correct
135. The branch of science which deals with the improvement of human race is known as
- (1) Genetics           (2) Heredity
  - (3) Eugenics           (4) Euthenics
136. A syndrome which results from the omission of a Barr body is
- (1) Down's           (2) Patau's
  - (3) Turner's       (4) Klinefelter's
137. Mutations mostly result in
- (1) Recessive gene   (2) Dominant gene
  - (3) Lethal gene       (4) None of these
138. Thalassaemia is a genetic anaemia and resembles with
- (1) Alkaptonuria   (2) Sickle cell syndrome
  - (3) Albinism       (4) Phenylketonuria
139. X-linked recessive alleles in human beings causes
- (1) Colourblindness for green and red colour
  - (2) Haemophilia
  - (3) Deficiency of glucose 6-phosphate dehydrogenase
  - (4) All the above
140. A couple has a colour blind daughter and a son with normal vision. What are the genotypes of the parent in this case ?
- (1) XX and XY       (2)  $X^C X^C$  &  $X^C Y$
  - (3)  $XX^C$  x XY       (4)  $XX^C$  x  $X^C Y$
141. In man blue eye colour is recessive to brown eye colour. If a boy has brown eyes and his mother is blue-eyed, what would be the phenotype and genotype of his father
- (1) Blue-eyed and bb
  - (2) Brown-eyed and bb
  - (3) Brown-eyed and Bb
  - (4) Black-eyed and Bb
142. Can brown eyed parents have blue eyed babies? If yes, the genotypes of parents must be
- (1) BB × BB       (2) BB × Bb
  - (3) Bb × Bb       (4) BB × bb
143. If the frequency of a dominant phenotype in a stable population is 75%, the frequency of recessive allele will be
- (1) 25%               (2) 50%
  - (3) 100%             (4) 10%
144. The frequency of Rh +ve is 60%. What would be the maximum percentage of marriages which could result in Rh incompatibility ?
- (1) 16%               (2) 24%
  - (3) 36%               (4) 48%
145. Who is associated with *Raphanobrassica*?
- (1) Muntzing       (2) E.R. Sears
  - (3) Karpechanko   (4) None of these
146. The change due to structural changes in chromosome can be
- (1) Reversed       (2) Cannot be reversed
  - (3) Is not known   (4) All of these
147. The process which involves reverse order of genes in chromosome is
- (1) Deficiency       (2) Aneuploidy
  - (3) Inversion       (4) Translocation
148. Frequency of an autosomal recessive lethal gene is 0.6, then what will be the frequency of dominant phenotype in progeny among 2000 individual ?
- (1) 1080               (2) 1280
  - (3) 960                (4) 320
149. Chromosome banding technique used to stain sulphate deficient regions, is
- (1) C-banding       (2) Q-banding
  - (3) R-banding       (4) G-banding
150. Select incorrect one
- | Disease                | Enzyme                       |
|------------------------|------------------------------|
| (1) Tay-Sach's disease | – Hexosaminidase             |
| (2) Gaucher's disease  | – Glucocerebrosidase         |
| (3) Alkaptonuria       | – Phenyl alanine hydroxylase |
| (4) Albinism           | – Tyrosinase                 |

151. Which group in Denver system has maximum number of chromosomes?  
 (1) Group A (2) Group B  
 (3) Group C (4) Group D
152. On the basis of centromere, *Drosophila* has four types of chromosomes and *Trillium* has only metacentric chromosomes. How many types of chromosomes found in man  
 (1) 4 (2) 3  
 (3) 2 (4) 1
153. There are seven groups of autosomal chromosomes according to Denver (Colorado) convention, 1960. It is according to size of chromosome and position of centromere. Which group has acrocentric chromosome?  
 (1) Group B (2) Group D  
 (3) Group C (4) Group F
154. Giemsa is related with  
 (1) Chromosome banding  
 (2) Polytene chromosome  
 (3) Klinefelter syndrome  
 (4) Cochineal insect
155. Quinacrine mustard produces stains  
 (1) In region rich in A—A  
 (2) In region rich in RNA  
 (3) In region rich in A—T bases  
 (4) In region rich in G—C bases
156. Which of the following is not caused due to gene error  
 (1) Sickle cell (2) Anaemia  
 (3) PKU (4) Acromegaly
157. Which of the following condition represents allopolyploidy?  
 (1) A polyploid where the chromosome number is not an exact multiple of its haploid number  
 (2) A polyploid containing genetically different chromosomes sets derived from two or more species  
 (3) A polyploid having identical set of genomes  
 (4) A polyploid formed by the union of two distinct chromosome sets with subsequent doubling of chromosomes number.
158. Match the following
- |                            |                                     |
|----------------------------|-------------------------------------|
| i. Turner's syndrome       | a. Inactivation of one X chromosome |
| ii. Klinefelter's syndrome | b. X-chromatin                      |
| iii. Barr body             | c. Phenotypically female (XO)       |
| iv. Dosage compensation    | d. Phenotypically male XXY          |
- (1) i—d, ii—a, iii—b, iv—c  
 (2) i—d, ii—a, iii—c, iv—b  
 (3) i—c, ii—d, iii—a, iv—b  
 (4) i—c, ii—d, iii—b, iv—a
159. Barr bodies result from  
 (1) Inactivation of one X chromosome by Y-chromosome  
 (2) Inactivation of few autosomes  
 (3) Inactivation of one X chromosome for dosage compensation  
 (4) Both (1) and (3)
160. Baldness is a trait which is  
 (1) Sex linked (2) Sex influenced  
 (3) Sex limited (4) Autosomal
161. A colour blind man marries the daughter of a colour blind person. In their progeny  
 (1) None of his daughters are colour blind  
 (2) All his sons are colour blind  
 (3) All his daughters are colour blind  
 (4) Half of his sons are colour blind
162. Usually the recessive character is expressed only when present in a double recessive condition. However, single recessive gene can express itself in human beings when the gene is present on  
 (1) Any autosome  
 (2) The X chromosome of the female  
 (3) The X chromosome of the male  
 (4) Either an autosome or X chromosome
163. Hemolytic jaundice is caused due to a dominant gene but only 10 percent of the people actually develop the disease. A heterozygous man marries a homozygous normal woman. What proportion of the children would be expected to develop the hemolytic disease?  
 (1) 1/5 (2) 1/10  
 (3) 1/15 (4) 1/20
164. Mutations do not result in  
 (1) Better varieties  
 (2) Death of organism  
 (3) Change in the genetic constitution of a cell  
 (4) Hybrid vigour
165. Down's syndrome is an example of  
 (1) Monosomy (2) Trisomy  
 (3) Triploidy (4) Polyploidy
166. Mutations which are not dominant are not lost by a gene pool. This is known as

- (1) Survival of the dominant  
 (2) Survival of the recessive  
 (3) Hardy-Weinberg law  
 (4) None of these
167. According to Hardy-Weinberg law the gene pool of a population tends to remain stable if the following conditions are met. Which is an incorrect statement?  
 (1) Large populations  
 (2) No mutations  
 (3) No migration  
 (3) No random mating
168. A record of inheritance of genetic traits for two or more generations presented as a diagram/flow chart is called  
 (1) Idiogram (2) Histogram  
 (3) Pedigree (4) Serendipity
169. Which of the following is not inheritable ?  
 (1) Point mutation (2) Somatic mutation  
 (3) Gene mutation (4) Chromosomal mutation
170. Which disease results from the genetic inability to synthesize a single enzyme ?  
 (1) Diabetes  
 (2) Phenylketonuria  
 (3) Colour blindness  
 (4) Down's syndrome
171. Because the gene of hemophilia is located on the X-chromosome it is normally impossible for a  
 (1) Carrier mother to pass the gene to her son  
 (2) Hemophiliac father to pass the gene to his son  
 (3) Hemophiliac father to pass the gene to his daughter  
 (4) Carrier mother to pass the gene to her daughter
172. If one parent has type AB blood and the other parent has type O blood, their offspring could have  
 (1) Type AB only  
 (2) Type AB and O only  
 (3) Type A and B only  
 (4) Type O only
173. Haemophilia most likely originated as a result of  
 (1) A nondisjunction of chromosome pair number 21  
 (2) The crossing-over of two sex chromosomes  
 (3) A gene mutation in X-chromosome  
 (4) The separation of two homologous chromosomes
174. Which would most probably be the genetic make up of the parents of a colour blind daughter ?  
 (1) Normal mother and normal father  
 (2) Carrier mother and normal father  
 (3) Carrier mother and colour blind father  
 (4) Colour blind mother and normal father
175. Klinefelter's syndrome is developed when the chromosome in male is  
 (1) XXY (2) XXXY  
 (3) XXYY (4) All of these
176. Colour blindness is more likely to occur in males than in females because  
 (1) Genes for characters are located on the sex-chromosomes  
 (2) The trait is dominant in males and recessive in females  
 (3) Some males suffer from deficit of vitamin A which is essential for the synthesis of visual purple (rhodopsin)  
 (4) The Y chromosomes of males have the genes for distinguishing colours
177. Seedless watermelon plants are obtained  
 (1) By raising triploids  
 (2) By inducing parthenogenesis  
 (3) By colchicine application  
 (4) By applying organic manure to the soil
178. A polyploid species with genomes derived from the same original species in an  
 (1) Autopolyploid (2) Allopolyploid  
 (3) Amphidiploid (4) Aneuploid
179. An organism or cell having a chromosomes number that is not an exact multiple of the monoploid or basic number is known as  
 (1) Autopolyploid (2) Allopolyploid  
 (3) Aneuploid (4) Euploid
180. The spread of genes from one breeding population to another by migration which may result in changes in gene frequency is called  
 (1) Genetic drift (2) Gene frequency  
 (3) Gene flow (4) None of these
181. Artificially induced mutations in *Drosophila* by X-ray irradiation were first caused by  
 (1) T. H. Morgan (2) H. J. Muller  
 (3) W. S. Sutton (4) W. Bateson
182. The cause of Mongolism is known to be  
 (1) A pituitary deficiency  
 (2) A pair of recessive genes  
 (3) The presence of one extra autosome  
 (4) The absence of one autosome
183. Which of the following is not an aneuploid?  
 (1) Monoploid (2)  $2n - 1$   
 (3) Trisomic (4)  $2n + 2$

184. Trisomy is
- (1) One chromosome less than  $2n$
  - (2) One chromosome more than  $2n$
  - (3) A hybrid obtained by crossing diploid with a tetraploid
  - (4) Three chromosomes more than  $2n$
185. Mutation is
- (1) A change that is inherited
  - (2) A change that affects the parents only but is never inherited
  - (3) A factor responsible for plant growth
  - (4) A change that affects the offspring of  $F_2$  generation only
186. Mongolism, Patau's syndrome and Edward's syndrome are example of
- (1) Autosomal abnormalities
  - (2) Allosomal abnormalities
  - (3) Both autosomal as well as allosomal abnormalities
  - (4) None of these
187. Turner syndrome is due to the following
- (1) XXY                      (2) XO
  - (3) XXY                      (4) XYY
188. If the haploid number of chromosomes is 10 in an organism, tetrasomy will have
- (1) 20 chromosomes
  - (2) 22 chromosomes
  - (3) 40 chromosomes
  - (4) 44 chromosomes
189. Webbed neck in females is characteristic of
- (1) XO                      (2) XXY
  - (3) XXXY                      (4) XYY
190. How many barr bodies and how many Y-spots will be seen in XXXYY condition
- (1) 1 and 2 respectively
  - (2) 2 and 2 respectively
  - (3) 2 and 1 respectively
  - (4) 3 and 2 respectively
191. Down's syndrome is due to
- (1) Crossing over between genes
  - (2) Linkage of genes
  - (3) Sex-linked inheritance
  - (4) Non-disjunction of chromosomes
192. Assume that an autosomal recessive gene for 'albinism' exists in rabbits. If such albino rabbit is mated with a wild type grey coloured female, what is the probability that a baby of theirs will be 'albino'?
- (1) 50% if the father is heterozygous
  - (2) 50% if the mother is heterozygous
  - (3) 50% if the father is homozygous
  - (4) More data required to answer this question
193. What is the probability that a haemophilic father ( $X^h Y$ ) and a normal homozygous woman (XX) will have a haemophilic daughter ?
- (1) 100%                      (2) 75%
  - (3) 50%                      (4) 0%
194. A normal woman, whose father had haemophilia married a normal man. What is the chance of occurrence of haemophilia in their children ?
- (1) 25% children will be haemophilic
  - (2) 50% children will be haemophilic
  - (3) 75% children will be haemophilic
  - (4) None haemophilic but 75% will be carriers
195. Albinism in man is controlled by a recessive gene (c). From the marriage between normally pigmented people (Cc) and albinos (cc). What proportion of the children would be expected to be albinos?
- (1)  $1/2$                       (2)  $1/4$
  - (3)  $3/8$                       (4)  $1/8$
196. A marriage between normal visioned man and colour blind woman will produce offspring
- (1) 50% colour blind sons and 50% carrier daughters
  - (2) Colour blind sons and carrier daughters
  - (3) Normal males and carrier daughters
  - (4) Colour blind sons and 50% carrier daughters
197. In human Karyotype, which group has SAT chromosomes ?
- (1) Group D
  - (2) Group G
  - (3) C, G and Y chromosome
  - (4) Both D and G
198. Cytoplasmic inheritance is responsible for
- (1) Inheritance of Kappa particle
  - (2) Leaf colour in *Mirabilis*
  - (3) Sterility of pollen in Maize
  - (4) All of these
199. Migration of genes from one population to another population is called
- (1) gene pool                      (2) genetic drift
  - (3) gene flow                      (4) gene conversion
200. Puffs in the salivary gland chromosomes represents the site for
- (1) RNA synthesis
  - (2) DNA synthesis
  - (3) Protein synthesis
  - (4) DNA duplication

201. The giant chromosomes of *Drosophila* are found in  
(1) Muscles (2) Ovaries  
(3) Testes (4) Salivary glands
202. Non-disjunction of chromosomes can be expected during  
(1) Metaphase I (2) Metaphase II  
(3) Anaphase I (4) Anaphase II
203. Primary constriction is also known as  
(1) Centromere  
(2) Nucleus  
(3) Nuclear membrane  
(4) Plasma membrane
204. Basic mechanism of hereditary transmission is  
(1) Sexual reproduction  
(2) Polyploidy  
(3) Splitting of chromosomes  
(4) The mitotic mechanism
205. The term gene refers to a  
(1) Portion of DNA molecule  
(2) Portion of chromosomes  
(3) Complete molecule of DNA  
(4) Portion of RNA
206. Chromosomes is composed of  
(1) DNA and RNA  
(2) RNA and proteins  
(3) Proteins and lipids  
(4) DNA, RNA and protein
207. Centromere is concerned with  
(1) Movement of chromosomes to the poles  
(2) Duplication of DNA  
(3) Splitting of chromosomes  
(4) Formation of spindle fibres
208. Dyad is  
(1) A pair of homologous chromosomes  
(2) A pair of non-homologous chromosomes  
(3) A pair of sister chromatids  
(4) A pair of non-sister chromatids
209. Chromosome theory of inheritance was proposed by  
(1) Mendel and Morgan  
(2) Lamarck and Darwin  
(3) Morgan and Sutton  
(4) Sutton and Boveri
210. A chromatid represents  
(1) Complete chromosome  
(2) One half of a chromosome  
(3) Genes of a chromosome  
(4) Haploid number of chromosomes
211. The characteristic size and shape of chromosomes of an organism at the mitotic metaphase is known as  
(1) Genome (2) Genotype  
(3) Karyotype (4) Phenotype
212. Chromosomes which remain condensed during interphase are called  
(1) Megachromosomes  
(2) Polytene chromosomes  
(3) Heterochromosomes  
(4) Euchromosomes
213. Feulgen reaction is a special test for  
(1) RNA (2) DNA  
(3) Protein (4) Carbohydrate
214. The point at which polytene chromosomes appear to be attached together is called  
(1) Chromocentre (2) Chromomere  
(3) Centriole (4) Centromere
215. A particular position of a gene on a chromosome is called  
(1) Factor (2) Locus  
(3) Centromere (4) Nucleosome
216. The centromere of chromosome divides into two during  
(1) Early prophase (2) Late prophase  
(3) Metaphase (4) Anaphase



**Choose the correct answers :**

- Which factor is related to translocation in protein synthesis of *E. coli* ?  
(1) EF-T<sub>u</sub> (2) EF-G  
(3) EF-T<sub>s</sub> (4) RF
- Oncogenes were discovered by  
(1) Jacob and Monod (2) Cairns  
(3) Behrem (4) Bishop and Varmus
- 2, 6-oxy, 5 methyl pyrimidine is  
(1) Adenine (2) Guanine  
(3) Thymine (4) Cytosine
- Which sequence is according to increasing molecular weight?  
(1) tRNA, DNA, RNA  
(2) rRNA, DNA, tRNA, mRNA  
(3) DNA, mRNA, rRNA, tRNA  
(4) tRNA, rRNA, mRNA, DNA
- Okazaki segments are  
(1) Segments of DNA capable of replication  
(2) Segments of a chain of nucleotides formed during replication of DNA  
(3) Segments of a chain of nucleotides formed during transcription  
(4) Segments of gene which undergo recombination
- In a nucleotide, N-base is attached to sugar at  
(1) C-1 (2) C-2  
(3) C-5 (4) C-3
- The term transposon was first used by  
(1) Barbara Mc Clintock  
(2) Hedges and Jacob  
(3) Rogers  
(4) All of these
- The term cistron, recon and muton were given by  
(1) Jacob and Monod  
(2) Seymour Benzer  
(3) Beadle and Tatum  
(4) Khorana
- Information pieces of split genes are  
(1) Exons (2) Introns  
(3) Pseudogenes (4) Cistrons
- Sex cells generally possess  
(1) Half the amount of DNA as the body cells  
(2) Half the amount of RNA as the body cells  
(3) The same amount of RNA as the body cells  
(4) Twice the amount of DNA as the body cells
- First mRNA codon discovered by Nirenberg and Mathai is  
(1) UAA (2) UGA  
(3) UCC (4) UUU
- Which type of DNA is found in bacteria  
(1) Straight DNA  
(2) Helical DNA  
(3) Membrane bound DNA  
(4) Circular free DNA
- Nuclein was named as nucleic acid by Altman. Who proved that nucleic acids are of two types?  
(1) Fuelgen (2) Behrens  
(3) Levene (4) Kossel
- DNA absorbs  $\lambda_{\max}$   
(1) 2600 Å (260 nm) (2) 7600 Å (760 nm)  
(3) 3900 Å (390 nm) (4) 3000 Å (300 nm)
- The term cistron was coined by  
(1) Benzer (2) Pauling  
(3) Correy (4) Jacob and Monod
- m-RNA is a polymer of  
(1) Ribonucleotides (2) Ribonucleosides  
(3) Nucleosides (4) None of these
- The two stands of DNA are coiled upon itself around a common axis. These are  
(1) Similar in nature and antiparallel  
(2) Different in nature  
(3) Antiparallel and complementary  
(4) Antiparallel but identical
- Who was first to determine the sequences of bases in nucleic acid?  
(1) Summer (2) Sanger  
(3) Khorana (4) Gamow
- The DNA in  $\phi \times 174$  collphage is single stranded and called  
(1) + ve strand (2) - ve strand  
(3)  $\pm$  strand (4) none of these
- Amount of DNA per diploid cell of man and its length is  
(1) 100 G and  $1.74 \text{ m} \times 10^{15}$   
(2) 5.6 pg and 1.74 cm  
(3) 6 pg and 174 cm  
(4) 100 g and 1.74 m
- The pattern of protein binding on DNA can be studied by  
(1) Light microscope  
(2) X - ray crystallography  
(3) Electron microscope  
(4) Ultracentrifugation

22. During protein synthesis, a ribosome moves from 5' to 3' end of mRNA to recognise all codons. This movement of ribosome is called  
 (1) Transformation (2) Translocation  
 (3) Transposition (4) Transduction
23. DNA strands are antiparallel because of  
 (1) Covalent bond (2) Phosphodiester bond  
 (3) Disulphide bond (4) All of these
24. If DNA replicates in conservative manner then in F<sub>1</sub>  
 (1) Daughter DNA molecules will be heavy  
 (2) One DNA molecules will be heavy and one light  
 (3) Both DNA molecules will be hybrid  
 (4) None of these
25. How many codons in mRNA are required to code 500 amino acids ?  
 (1) 500 + 1 + 1 (2) 500  
 (3) 500 + 1 (4) 1500 + 1 + 1
26. A muton is  
 (1) 5 pairs of nucleotides  
 (2) 1 pair of nucleotides  
 (3) 10 pairs of nucleotidase  
 (4) 20 pairs of nucleotides
27. Overlapping genes was first discovered in  
 (1)  $\phi \times 174$  (2) TMV  
 (3)  $\lambda$ -phage (4) FMDV
28. The building blocks, required during DNA polymerization are  
 (1) AMP, GMP, TMP & CMP  
 (2) ADP, GDP, TDP & CDP  
 (3) ATP, GTP, TTP & CTP  
 (4) Any of the above
29. How many molecules of water can be released during the formation of 3' to 5' phosphodiester bond during DNA replication  
 (1) 1 (2) 2  
 (3) 4 (4) 0
30. The solenoid model of DNA was proposed by  
 (1) Sanger (2) Finch & Klug  
 (3) Watson & Crick (4) McClintock
31. With the help of the data that A = 21%, C = 29%, G = 29%, U = 21%, state whether the genetic material is  
 (1) Double stranded RNA  
 (2) Single stranded RNA  
 (3) Double stranded DNA  
 (4) Single stranded DNA
32. "Degenerate" codes are when  
 (1) The codons degenerates soon after the synthesis of protein  
 (2) One codon can code for more than one amino acid  
 (3) The codon is non-functional and is also known as non-sense codon  
 (4) The same amino acid can be coded by more than one triplet codon
33. Normally GUG specifies valine aminoacid, but when it is initiator codon then it specifies which one of the following amino acid?  
 (1) Valine (2) Threonine  
 (3) Methionine (4) Lysine
34. A sequene of three bases for coding an amino acid is termed  
 (1) Anticodon (2) Cistron  
 (3) Codon (4) None of these
35. Experiments using N<sup>15</sup> (heavy nitrogen) to confirm the semi-conservative replication of DNA were carried out by  
 (1) Meselson and Stahl  
 (2) Hershey and Chase  
 (3) Beadle and Tatum  
 (4) Watson and Crick
36. The segment of a DNA which participates in the synthesis of a chain of polypeptide is known as  
 (1) Recon (2) Muton  
 (3) Cistron (4) Replicon
37. Number of base pairs in human chromosomes per haploid set is  
 (1)  $3 \times 10^9$  (2)  $3 \times 10^7$   
 (3)  $6 \times 10^8$  (4)  $6 \times 10^7$
38. DNA was discovered in 1868 by Swiss biochemist named  
 (1) Friedrich Miescher  
 (2) Robert Brown  
 (3) Watson and Crick  
 (4) Wilkins
39. Which of the following was later on found to be the Kornberg enzyme ?  
 (1) DNA polymerase I  
 (2) DNA polymerase II  
 (3) DNA polymerase III  
 (4) Any of the above
40. DNA polymerases besides DNA polymerization in 5' → 3' direction are also active

- (1) To cut ribonucleotides in 5' → 3' as well as in 3' → 5'  
 (2) To add ribonucleotides of RNA primer  
 (3) Both (1) and (2)  
 (4) None of the above
41. In a DNA molecule, the sugars binds  
 (1) By glycosidic bonds to phosphate groups  
 (2) By ester bonds to nitrogenous bases  
 (3) To nitrogenous bases by hydrogen bond  
 (4) To both phosphate groups and nitrogenous bases by covalent bonds
42. For deciphering the genetic code, H.G. Khorana synthesised  
 (1) Gene for yeast alanyl tRNA  
 (2) Copolymers of repetitive sequences  
 (3) Triplet codon  
 (4) Homopolymer
43. X-Ray diffraction technique was used by Wilkins and Franklin to ascertain the structure of  
 (1) RNA (2) Proteins  
 (3) DNA (4) Fats
44. In his experiment on the chemistry of DNA, Chargaff estimated the base composition of human sperms and found that Adenine constituted 31% and Guanine 19%. The quantity of cytosine in the DNA of human somatic cell is likely to be  
 (1) 19% (2) 38%  
 (3) 62% (4) 31%
45. A DNA strand is directly involved in the synthesis of all the following except  
 (1) Another DNA strand  
 (2) Protein molecule  
 (3) t-RNA molecule  
 (4) m-RNA molecule
46. In bacteria, joining of DNA strands is carried out by  
 (1) DNA polymerase I  
 (2) DNA polymerase II  
 (3) DNA polymerase III  
 (4) DNA ligase
47. In yeast alanyl-tRNA the number of nucleotides are  
 (1) 77 only (2) 77 pairs  
 (3) 88 only (4) 88 pairs
48. Most of the Genetic codes are  
 (1) With comma, ambiguous, non-degeneracy and overlapping  
 (2) Commaless, non-ambiguous, degenerate and non-overlapping  
 (3) With comma, ambiguous, non-degeneracy and overlapping  
 (4) Commaless, non-ambiguous, degeneracy and non-overlapping
49. mRNA of eukaryotes is synthesized with the help of  
 (1) RNA polymerase I  
 (2) RNA polymerase II  
 (3) RNA polymerase III  
 (4) DNA dependent RNA polymerase I
50. Types of tRNA which are involved in the polypeptide synthesis from the following nucleotides  
 5' AUGGUUCAUGUCCUACACUAA 3'  
 (1) 3 (2) 4  
 (3) 6 (4) 5
51. In eukaryotes the extra nuclear chromosomes are present in  
 (1) Mitochondria (2) Plastids  
 (3) Vacuoles (4) Both (1) & (2)
52. Types of RNA polymerase required during heterocatalytic activities of DNA in prokaryotes  
 (1) 1 (2) 2  
 (3) 3 (4) 4
53. The movement of ribosome on mRNA during translocation takes place in  
 (1) 5' → 3' (2) 3' → 5'  
 (3) 5' → 5' (4) 3' → 3'
54. Peptidyl transferase is present in  
 (1) Cytosol (2) 30 S ribosomes  
 (3) 50 S ribosomes (4) Nucleus
55. Sugar in DNA is called deoxyribose as  
 (1) It has one atom of oxygen lesser than that of ribose  
 (2) It has one oxygen atom more than that of ribose  
 (3) It is formed from ribose by deoxygenation  
 (4) None of these
56. Who was awarded Nobel Prize for researches on jumping genes in maize ?  
 (1) T. H. Morgan  
 (2) H. J. Muller  
 (3) De Vries  
 (4) Barbara McClintok
57. A polypeptide has 30 amino acids in its chain. What could be the number of bases in mRNA template  
 (1) 30 (2) 60  
 (3) 90 (4) 93
58. Wobble hypothesis and one of the following features of genetic code are synonyms

- (1) Codons are commaless  
 (2) Codon are non-overlapping  
 (3) Codon are degenerate  
 (4) Codon are non-ambiguous
59. The genetic code in mitochondria / chloroplasts differs in one of the following senses :
- (1) UGA codes for tryptophan rather than termination  
 (2) AGA and AGG act as terminating codons rather than coding for arginine  
 (3) AUA codes methionine rather than isoleucine and CUA codes threonine rather than leucine  
 (4) All the above
60. Amino acids having as many as 6 codons are :
- (1) Phenylalanine, arginine, alanine  
 (2) Cysteine, histidine, lysine  
 (3) Serine, arginine, leucine  
 (4) Lysine, valine, alanine
61. DNA synthesis can be specially measured by estimating the incorporation of radio active
- (1) Uracil (2) Adenine  
 (3) Thymine (4) Hydrogen
62. Which of the following stages is known for DNA replication ?
- (1) Metaphse (2) G1-phase  
 (3) S-phase (4) G2-phase
63. The nuclease enzyme, which begins its attack from free end of a polynucleotide, is
- (1) Exonuclease (2) Kinase  
 (3) Polymerase (4) Endonuclease
64. Two bacteria found to be very useful in genetic engineering experiments are
- (1) *Nitrosomonas* and *Klebsiella*  
 (2) *Escherichia* and *Agrobacterium*  
 (3) *Nitrobacter* and *Azotobacter*  
 (4) *Rhizobium* and *Diplococcus*
65. Which of the following is related to genetic engineering ?
- (1) Lysosomes (2) Golgi apparatus  
 (3) Mitochondria (4) Plasmids
66. The chemical knives of DNA are
- (1) Ligases (2) Polymerases  
 (3) Endonucleases (4) Plasmids
67. The repressor of operon model binds itself to
- (1) Operator gene (2) Regulator gene  
 (3) Promotor gene (4) Structural gene
68. Genes that are involved in turning on or off the transcription of a set of structural genes are called
- (1) Operator gene  
 (2) Polymorphic gene  
 (3) Redundant gene  
 (4) Regulator gene
69. The Nobel Prize for artificial synthesis of genes was awarded to
- (1) Khorana (2) Nirenberg and Mathaei  
 (3) Ochoa (4) Kornberg
70. Which one of the following base is found in RNA ?
- (1) Cytosine (2) Guanine  
 (3) Thymine (4) Uracil
71. Which of the following ratios is constant in dsDNA's of different species?
- (1)  $\frac{A+T}{C+G}$  (2)  $\frac{A+G}{T+C}$   
 (3)  $\frac{A+U}{C+G}$  (4)  $\frac{A+C}{U+G}$
72. The lac operon is an example of
- (1) Arabinose operon  
 (2) Inducible operon  
 (3) Repressible operon  
 (4) Overlapping genes
73. Anticodon is unpaired triplet of bases in an exposed position of
- (1) m-RNA (2) r-RNA  
 (3) t-RNA (4) Both (1) & (2)
74. The formation of r-RNA occurs in
- (1) Cytoplasm (2) Nucleolus  
 (3) Ribosome (4) Nucleoplasm
75. Which step of translation does not consume a high energy phosphate bond ?
- (1) Translocation  
 (2) Amino acid activation  
 (3) Peptidyl transferase reaction  
 (4) Aminoacyl t-RNA binding to A-site
76. The genetic material of TMV is
- (1) tRNA (2) Ribonucleotides  
 (3) DNA (4) Deoxyribonucleotides
77. Which factor plays an important role in shifting tRNA from A to P site on a ribosome ?
- (1) ATP (2) GTP  
 (3) Translocase (4) Permease

78. The synthesis of RNA from DNA is known as  
 (1) Translation (2) Transition  
 (3) Transversion (4) Transcription
79. Genetic code was deciphered by  
 (1) Nirenberg and Khorana  
 (2) Kornberg, Ochoa and Khorana  
 (3) Nirenberg, Holley and Khorana  
 (4) Nirenberg and Kornberg
80. Who laid the foundation of biochemical genetics ?  
 (1) Meselson and Stahl  
 (2) Beadle and Tatum  
 (3) Watson and Crick  
 (4) Jacob and Monod
81. DNA is single stranded in  
 (1) Reoviruses (2) Retroviruses  
 (3)  $\phi \times 174$  virus (4) All of these
82. Replication of DNA is  
 (1) Semi-conservative and continuous  
 (2) Semi-conservative and discontinuous  
 (3) Semi conservative and semi discontinuous  
 (4) All of these
83. Interferons are  
 (1) Antiviral proteins  
 (2) Antibiotic proteins  
 (3) Antiseptic proteins  
 (4) Anticancerous proteins
84. Eukaryotic mRNAs are associated with proteins to form ribonucleoprotein complexes. Some of these may remain in cytoplasm for a long time before being genetically expressed. Such complexes are called  
 (1) Polysomes  
 (2) Ribonucleoprotein fibres  
 (3) Protoncogenes  
 (4) Informosomes
85. Ratio of DNA : Histone is 1 : 1 in Eukaryotes. In Prokaryotes it is  
 (1) 1 : 2 (2) 2 : 1  
 (3) 1 : 0 (4) 2 : 0
86. The 2 strands of DNA are held together by H – bonds between  
 (1) Sugar and  $PO_4$  group  
 (2) Sugar and bases  
 (3) Nitrogenous bases  
 (4)  $PO_4$  and bases
87. tRNA is also called  
 (1) Soluble RNA  
 (2) Microsomal RNA  
 (3) Ribosomal RNA  
 (4) Heterogenous RNA
88. The helical struture of DNA is maintained by  
 (1) Amide bonds (2) H – bonds  
 (3) Covalent bonds(4) Phosphodiester bonds
89. DNA replication is  
 (1) Semiconservative directional and continuous  
 (2) Semi conservative bidirectional and continuous  
 (3) Semi conservative bidirectional and semi-discontinuous  
 (4) Semi conservative only
90. The wrong base if added, is removed and proper base is added during DNA replication by  
 (1) DNA Polymerase I  
 (2) DNA Polymerase II  
 (3) DNA Polymerase III  
 (4) Any one of these
91. Suppose evolution on earth had occurred in such a way that there are 96 amino acids instead of 20. DNA has 12 different types of bases and DNA synthesis occurs in the same way as today. The minimum number of bases per DNA codon would be  
 (1) 12 (2) 8  
 (3) 2 (4) 3
92. In *Escherichia coli*, the product of *i* gene combines with  
 (1) Operator gene to switch off structural genes  
 (2) Inducer gene to switch off structural genes  
 (3) Operator gene to switch on structural genes  
 (4) Regulator gene to switch off structural genes
93. Lactose operon produces enzymes  
 (1)  $\beta$ -galactosidase, permease and glycogen synthetase  
 (2)  $\beta$ -galactosidase, permease and transacetylase  
 (3) Permease, glycogen synthetase and transacetylase  
 (4)  $\beta$ -galactosidase, phosphoglucose, isomerase and permease
94. Gene and cistron are sometimes used as synonyms because  
 (1) One gene contains one cistron  
 (2) One gene contains many cistrons  
 (3) One gene contains no cistron  
 (4) One cistron contains many genes
95. Consanguineous marriages show  
 (1) Increase in appearance of recessive defective traits  
 (2) Marriages in blood relations  
 (3) Union of gametes within same genetic ancestry  
 (4) All of the above



96. Which is not an oncogenic virus?  
 (1) Rous Sarcoma Virus & Wound Tumour Plant Virus  
 (2) Polyoma Virus & SV40  
 (3) Epstein barr & Papiloma Virus  
 (4) None of the above
97. Lac-operon and tryptophan operons are the examples of  
 (1) Positive control  
 (2) Negative control  
 (3) Both positive and negative control  
 (4) Neither positive nor negative control
98. The enzyme that causes splicing of DNA is called  
 (1) Ribozyme (2) Spliceosome  
 (3) Both (1) and (2) (4) None of the above
99. The word ribonucleoprotein (RNP) represents  
 (1) An RNA (2) An RNA polymerase  
 (3) Aribonucleotide (4) Ribosome
100. A coordinated unit which controls the genetic expression is known as  
 (1) Cistron (2) Recon  
 (3) Muton (4) Operon
101. In *E. coli*, 'Lac' operon is induced by  
 (1) Lactose (2)  $\beta$ -galactosidase  
 (3) Promoter gene (4) The 'I' gene
102. In 1980, F. Sanger was awarded Nobel prize second time to be shared by Gilbert and Moseum for their work on  
 (1) Genetic mapping of chromosomes  
 (2) Determining amino acid sequence of insulin  
 (3) Determining base sequence of DNA  
 (4) Determining the structure of DNA
103. In eukaryotic genes, the coding sequence are called  
 (1) Exons (2) Introns  
 (3) Cistrons (4) Operons
104. Tryptophan operon is related to  
 (1) Inducible enzymes  
 (2) Repressible enzymes  
 (3) Constitutive enzymes  
 (4) All of these
105. Aporepressor is  
 (1) Non-functional end-product of an enzyme controlled process  
 (2) Non-functional regulator protein  
 (3) Functional co-repressor  
 (4) Functional repressor
106. Viral DNA becomes part of host DNA in  
 (1) Prophage (2) Lysogeny  
 (3) Lysis (4) Attenuated virus
107. HIV virus (AIDS) is a  
 (1) Ribovirus (2) Deoxyvora virus  
 (3) Retrovirus (4) None of these
108. Provirus differs from prophage in  
 (1) Integration of copy DNA of a retrovirus with host chromosome (DNA)  
 (2) Integration of RNA with host DNA  
 (3) Integration of genetic DNA with host DNA  
 (4) All the above
109.  $\lambda$  (Lambda) phages are temperate phages and show  
 (1) Both lytic and lysogenic cycle  
 (2) Lytic cycle  
 (3) Lysogenic cycle  
 (4) None of the above
110. Viroids discovered by Diener (1971) differ from viruses in being  
 (1) Naked DNA molecules only  
 (2) Naked RNA molecules only  
 (3) Naked DNA packaged with genome  
 (4) Satellite RNA packaged with viral genome
111. A maize plant has 20 chromosomes in the nuclei of its cells. What will be the number of linkage groups in maize?  
 (1) 5 (2) 10  
 (3) 20 (4) 40
112. The genes which are constantly expressed  
 (1) Pleiotropic genes  
 (2) Structural genes  
 (3) Regulator genes  
 (4) Constitutive genes
113. During DNA replication  
 (1) One of the two strands functions as template  
 (2) Both the strands function as template  
 (3) Both the strands are duplicated by two different enzymes  
 (4) Only one of the strands needs a primer
114. A DNA with both heavy strands is allowed to replicate in a medium of  $^{14}\text{N}$  for two generations. After density centrifugation we will get  
 (1) One intermediate and one heavy band  
 (2) One intermediate band  
 (3) One intermediate and one light band  
 (4) One heavy and one light band

115. Polynucleotide ligase has  
 (1) Nicking and sealing activity  
 (2) Only nicking activity  
 (3) Only sealing activity  
 (4) Polymerisation and sealing activity
116. Which of the following activities is common to DNA Polymerase I, II and III  
 (1) 3' → 5' exonuclease  
 (2) 5' → 3' polymerisation  
 (3) 5' → 3' exonuclease  
 (4) Both (1) and (2)
117. Who proved that DNA is basic genetic material?  
 (1) Hershey and Chase  
 (2) Avery, Mac leod and Mc Carty  
 (3) Both of these  
 (4) All of the above
118. Watson and Crick's model of DNA is a duplex with  
 (1) 10 basepairs and 34 Å distance for every turn  
 (2) 10 base pairs and 3.4 Å distance for each turn of spiral  
 (3) 20 base pairs and 3.4 Å distance for each turn of spiral  
 (4) None of the above
119. Nucleotide arrangement in DNA can be seen by  
 (1) Electron microscope  
 (2) X-ray crystallography  
 (3) Phase contrast microscope  
 (4) ELISA
120. Proflavin and acridine orange induce  
 (1) Transition (2) Transversion  
 (3) Inversion (4) Frameshift mutations
121. UV-rays as mutagenic agent was shown by  
 (1) Auerbach (2) Stadler  
 (3) Altenberg (4) Muller
122. Base substitution caused by 5-bromouracil and BuDR are called  
 (1) Inversions (2) Transitions  
 (3) Transversion (4) Translocation
123. Which of the following radiations do not result in any mutational change?  
 (1) X-rays (2) Gamma rays  
 (3) Ultraviolet rays (4) infrared rays
124. Gibberish mutation is caused by  
 (1) 5-Bromouracil (2) Nitrous acid  
 (3) Acridines (4) None of these
125. Genetic mutation occurs in  
 (1) DNA (2) RNA  
 (3) Chromosomes (4) Nucleus
126. A rearrangement of group of genes in a chromosomes in such a way that order of genes in the chromosomes is reversed is known as  
 (1) Conversion (2) Inversion  
 (3) Realignment (4) Heteropycnosis
127. The process in which a structural analogue causes point mutation is termed  
 (1) Translocation (2) Transition  
 (3) Transversion (4) Inversion
128. Mutation in which only one pair of nucleotide is involved is termed  
 (1) Point mutation  
 (2) Gross mutation  
 (3) Chromosomal mutation  
 (4) All of these
129. When a purine is changed into another purine and pyrimidine is changed to another pyrimidine, it is known as  
 (1) Translation (2) Transduction  
 (3) Transition (4) Transformation
130. A DNA strand has the nucleotide sequence ATG AAA GGG CCC TTT etc. Which one of the following is a frame-shift mutation ?  
 (1) ATG GAA GGG CCC TTT  
 (2) ATG AAA CGG GCC CTT  
 (3) ATC GAA GGG CCC TTT  
 (4) ATG AAA GGG GCC TTT
131. Which one of the following is a base analogue ?  
 (1) Nitrous acid (2) Colchicine  
 (3) 5-bromouracil (4) Caffeine
132. Base substitutions caused by base analogues are called  
 (1) Transitions  
 (2) Transversions  
 (3) Intragenic complementations  
 (4) Intergenic complementations

**Choose the correct answers :**

1. Seedless water melon is  
(1) Triploid                      (2) Tetraploid  
(3) Hexaploid                  (4) Pentaploid
2. Science of engineering and technology applied to life sciences is  
(1) Biotechnology              (2) Genetic engineering  
(3) Pathology                  (4) Biological science
3. Pomato is  
(1) Somatic hybrid  
(2) Natural mutant  
(3) Androgenic haploid  
(4) Allopolyploidy
4. Greatest benefit of shoot tip/meristem culture is  
(1) Development of somaclonal variations  
(2) Development of transgenic plants  
(3) Production of virus free plants  
(4) All of the above
5. Hardening is induced by keeping plantlets under  
(1) High light intensity and low humidity  
(2) Low light intensity and low humidity  
(3) Low light intensity and high humidity  
(4) High light intensity and high humidity
6. The auxin used in tissue culture is  
(1) IAA                          (2) 2, 4-D  
(3) NAA                         (4) Both (2) and (3)
7. Two protoplasts can be made to fuse through the application of  
(1) Electrofusion              (2) Polyethylene glycol  
(3) Sodium nitrate            (4) All of the above
8. An androgenic plant can be converted into homozygous diploid plant through the application of  
(1) Nitrogen mustard        (2) Nitrous acid  
(3) Colchicine                 (4) Acridine orange
9. Differentiation of callus into plant parts is  
(1) Embryogenesis            (2) Embryoid formation  
(3) Morphogenesis            (4) Totipotency
10. Tissue culture technique was first performed successfully by  
(1) Haberlandt                (2) Nobecourt  
(3) White                        (4) Gautheret
11. Part of plant used for culturing is called  
(1) Scion                        (2) Explant  
(3) Stock                        (4) Callus
12. Name the tissue culture technique used to grow nonviable inter-specific hybrids  
(1) Androgenic haploids  
(2) Shoot tip culture  
(3) Somatic embryogenesis  
(4) Embryo rescue
13. Embryoid is  
(1) Nonzygotic embryo  
(2) Nonfunctional embryo  
(3) Parthenogenetic embryo  
(4) An early stage in callus differentiation
14. Pathogen free plants can be obtained through  
(1) Clean cultivation  
(2) Embryoid cultivation  
(3) Bud or shoot tip propagation on culture medium  
(4) Grafting
15. Which is the oldest method of crop improvement?  
(1) Hybridisation              (2) Selection  
(3) Mutation                  (4) Introduction
16. Homozygous plants are obtained from  
(1) Androgenic haploids  
(2) Gynogenic haploids  
(3) Self-pollinating haploids  
(4) Cross-pollinating haploids
17. In crop improvement programme, haploids are important because they  
(1) Require one half of nutrients  
(2) Are helpful in study of meiosis  
(3) Grow better under adverse conditions  
(4) Form perfect homozygous individuals on diploidisation
18. Intergeneric and interspecific hybrids are obtained by  
(1) Somaclonal variations  
(2) Somatic hybridisation  
(3) Parasexual hybridisation  
(4) Both (2) & (3)
19. How can genetic variation be caused in plants which multiply only by asexual reproduction ?  
(1) By inbreeding              (2) By outbreeding  
(3) By mutation                (4) By amphimixis
20. The first hybrid between Carnation and Sweet Williams was obtained by  
(1) Harries                      (2) Thomas Fairchild  
(3) Watkins                     (4) Steward
21. Long shelf-life of tomato has been achieved by the process of  
(1) Genetic engineering  
(2) Protoplast fusion  
(3) Somaclonal variation  
(4) Androgenic haploids

22. Widest range of variations can be obtained by which one of the following methods?
- (1) Protoplast fusion
  - (2) Genetic engineering
  - (3) Tissue culture
  - (4) None of these
23. What are monoclonal antibodies
- (1) Identical molecules specific for one type of antigen
  - (2) Antibodies which can be produced by cloning hybridomas
  - (3) Both of these
  - (4) None of these
24. What are hybridoma ?
- (1) They are hybrids of plants
  - (2) They are hybrids of animals
  - (3) They are fusion products of antibody producing lymphocyte cells of the spleen and cells from cancerous tumours known as myelomas
  - (4) They are hybrids of a plant cell and an animal cell
25. What is the advantage of the hybridoma technique ?
- (1) The hybridoma cells are rich in specific antibodies and are, therefore, cultured for large scale production of antibodies
  - (2) The hybridoma cells attack the myeloma cell
  - (3) The hybridoma grow vigorously in the culture medium
  - (4) They produce large number of B lymphocytes
26. The restriction enzymes are used in genetic engineering because
- (1) They are nucleases that cut DNA at variable sites
  - (2) They can degrade harmful proteins
  - (3) They can cut DNA at specific base sequence
  - (4) They can join different DNA fragments
27. The transgenic animals are those which have
- (1) Foreign RNA in all its cells
  - (2) Foreign DNA in all its cells
  - (3) Foreign DNA in some of its cells
  - (4) Both (1) & (2)
28. Transfer of genetic information from one bacterium to another in the transduction process is through
- (1) Another bacterium
  - (2) Physical contact between donor and recipient strains
  - (3) Bacteriophages released from the donor bacterial strain
  - (4) Conjugation
29. Genetic engineering is possible because
- (1) We can cut DNA at specific sites by endonucleases like DNA ase
  - (2) The phenomenon of transduction in bacteria is well understood
  - (3) We can see DNA by electron microscope
  - (4) Restriction endonucleases purified from bacteria can be used in vitro
30. Recombinant DNA technology is related with
- (1) Herbert Boyer
  - (2) C. Darwin
  - (3) Stanley Cohen
  - (4) Both (1) and (3)
31. Hirudin gene inserted in *Brassica napus* was
- (1) Synthesized chemically
  - (2) Obtained from *Drosophila*
  - (3) Obtained from *Bacillus thuringensis*
  - (4) Got from *E. coli*
32. A GM (genetical modified) crop is
- (1) Irradiated crop
  - (2) Transgenic crop
  - (3) A green manures
  - (4) All of these
33. A bioweapon consists of
- (1) Biological agent
  - (2) All nonliving agent
  - (3) Missile or aircraft
  - (4) All of these
34. Toxic component of *Bacillus thuringensis* is
- (1) Alkaloid
  - (2) Steroid
  - (3) Amino acid
  - (4) Protein
35. Hybrid corn is obtained by
- (1) Crossing corn plants with wild wheat
  - (2) Protoplasim fusion between two varieties of corn
  - (3) Crossing two varieties of inbred lines of corn
  - (4) None of the above
36. Heterosis has been exploited in
- (1) Tomato, Petunia, Cabbage
  - (2) Tomato, Pea, *Shorea*
  - (3) Pea, *Shorea*, *Tectona*
  - (4) None of the above
37. To maintain hybrid vigour the method of propagation is
- (1) Sexual reproduction
  - (2) Vegetative propagation
  - (3) Somatic hybridization
  - (4) Both (2) and (3)
38. The correct sequence of  $2n$ ,  $4n$  and  $6n$  wheat is
- (1) *Triticum aestivum*, *Triticum monococcum*, *triticum turgidum*
  - (2) *Triticum turgidum*, *Triticum monococcum*, *Triticum aestivum*

- (3) *Triticum monococcum*, *Triticum aestivum*,  
*Triticum turgidum*
- (4) *Triticum monococcum*, *Triticum turgidum*,  
*Triticum aestivum*
39. A 2n wheat was fertilised by which of the following to ultimately yield a 4n wheat?
- (1) Wild goat grass
  - (2) Wild sheep grass
  - (3) Wild deer grass
  - (4) Lemon grass
40. Gamma rays are obtained from
- (1) <sup>60</sup>Cobalt
  - (2) <sup>137</sup>Caesium
  - (3) <sup>14</sup>Cobalt
  - (4) Both (1) and (2)
41. Many of the sugarcane varieties today are
- (1) Aneuploids
  - (2) Autopolyploids
  - (3) Allopolyploids
  - (4) Autoallopolyploids
42. Interspecific hybridisation to produce hybrid plants could be successfully done by
- (1) Anther culture
  - (2) Embryo rescue
  - (3) Irradiation
  - (4) Recombinant DNA technology
43. Composition of Bordeaux Mixture is
- (1) 40gm Copper sulphate + 40gm Calcium hydroxide in 10 liters of water
  - (2) 40gm Ammonium nitrate + 40gm Calcium hydroxide in 5 liters of water
  - (3) 80gm Copper sulphate + 40gm Calcium hydroxide in 10 liters of water
  - (4) 40gm Copper sulphate + 40gm Calcium hydroxide in 5 liters of water
44. *Triticale* was obtained by hybridisation of
- (1) Wheat and rye
  - (2) Wheat and ragi
  - (3) Wheat and *sorghum*
  - (4) Wheat and pearl millet
45. The best method to avoid contamination from an undesired pollen during hybridisation is
- (1) Emasculation
  - (2) Use of male sterile lines
  - (3) Emasculation followed by bagging
  - (4) Intra ovarian pollination
46. Heterosis is
- (1) Production of pure lines by repeated selfing
  - (2) Differential reproduction of individuals in a population
  - (3) Superiority of the hybrid over either parents
  - (4) Allopolyploid breeding
47. Explant is
- (1) Embryos produced by tissue culture
  - (2) Callus formed during tissue culture
  - (3) Discarded part of a plant
  - (4) Part of a plant used for tissue culture
48. One step homozygous lines could be produced through
- (1) Hybridisation
  - (2) Androgenic haploids
  - (3) Polyploids
  - (4) Embryo rescue
49. Variations appearing during tissue culture are called
- (1) Somaclonal variations
  - (2) Somatic variations
  - (3) Germinal variations
  - (4) Cultural variations
50. PEG is
- (1) A fusogen
  - (2) A nutrient medium
  - (3) A plasmid
  - (4) A diet supplement
51. Which of the following is not a method of gene transfer?
- (1) Recombinant DNA technology
  - (2) Electroporation
  - (3) Polymerase chain reaction
  - (4) Gene gun method
52. Potatoes are usually propagated by vegetative means because
- (1) They do not produce seeds
  - (2) By this method it is possible to maintain genetic quality
  - (3) By this method incidence of diseases may be reduced
  - (4) Potato seeds have long dormancy period
53. Best method for germplasm exchange in Banana is by
- (1) Recalcitrant seeds
  - (2) Shoot tip culture
  - (3) Embryo culture
  - (4) Cryopreservation of inflorescence
54. Natural resistance to late blight of potato is present in
- (1) *Solanum stoloniferous*
  - (2) *Solanum acaule*
  - (3) *Solanum demissium*
  - (4) *Solanum tuberosus*
55. Root knot of Brinjal is caused by
- (1) *Fusarium udum*
  - (2) *Pseudomonas putida*
  - (3) *Meloidogyne incognita*
  - (4) *Anguina solanacearum*



56. Grains of major cereals and millets lack amino acids  
 (1) Lysine and tryptophan  
 (2) Methionine and lysine  
 (3) Methionine and cysteine  
 (4) Tryptophan and cysteine
57. Pulses usually lack amino acids  
 (1) Cysteine and methionine  
 (2) Cysteine and tryptophan  
 (3) Methionine and tryptophan  
 (4) Methionine and valine
58. *Spirulina* is an  
 (1) Edible fungus  
 (2) Bioinsecticide  
 (3) Single cell protein  
 (4) Biopesticide
59. Single cell protein (SCP) is  
 (1) Protein obtained from a clone of cells  
 (2) Protein obtained from unicellular organisms  
 (3) Biomass got from microorganisms  
 (4) Proteins obtained from biomass of microorganisms
60. Lathyrism due to consumption of Khesri Dal is  
 (1) Skeletal deformation and thinning of collagen fibres  
 (2) Skeletal deformities, diabetes mellitus and reproductive failure  
 (3) Retarded growth, precocious puberty and renal dysfunction  
 (4) Cardiovascular abnormalities mental retardation and delayed puberty
61. Pusa Lerma is a variety of  
 (1) Rice (2) Barley  
 (3) Wheat (4) Corn
62. Most widely grown rice variety in the world is  
 (1) IR 26 (2) IR 30  
 (3) IR 35 (4) IR 36
63. Atomita 2 is  
 (1) High yielding cultivar of rice  
 (2) Insect resistant variety of tomato  
 (3) Salt tolerant variety of maize  
 (4) Highly palatable cultivar of wheat
64. Progeny of single self-fertilized homozygous plant is  
 (1) Clone (2) Pure line  
 (3) Inbred (4) None of these
65. Pure line selection is used as a method of crop improvement in  
 (1) Self-pollinated plants  
 (2) Cross pollinated plants  
 (3) Vegetatively propagated plants  
 (4) All of the above
66. Method particularly important for improvement of cross pollinated plants is  
 (1) Pure line selection (2) Mass selection  
 (3) Clonal selection (4) None of these
67. Emasculation is step of  
 (1) Selection (2) Mutation breeding  
 (3) Hybridization (4) Introduction
68. Emasculation is  
 (1) Removal of male reproductive part of a flower  
 (2) Removal of female reproductive part of a flower  
 (3) Methods of artificial culture  
 (4) None of the above
69. Superiority of hybrid over its parents is called  
 (1) Heterosis (2) Necrosis  
 (3) Chlorosis (4) Epistasis
70. Which of the following method is not used for crop improvement ?  
 (1) Introduction (2) Inbreeding  
 (3) Hybridization (4) Tissue culture
71. Polyploidy is induced by  
 (1) Kinetin (2) GA<sub>3</sub>  
 (3) Cochicine (4) IAA
72. Hexaploid wheat is  
 (1) *Triticum monococcum*  
 (2) *T. durum*  
 (3) *T. turgidum*  
 (4) *T. aestivum*
73. Inbreeding is possible between two members of  
 (1) Order (2) Family  
 (3) Genus (4) Species
74. Famous and improved IR-8 variety of rice is introduction in India from  
 (1) Japan (2) Peru  
 (3) Taiwan (4) Phillipines
75. Improved wheat variety having gene for dwarfness and higher percentage of protein is  
 (1) Kalyan (2) Sharbati sonara  
 (3) Sonalika (4) Lerma rojo
76. Best method to increase crop yield is  
 (1) By weed eradication  
 (2) By use of tractors  
 (3) By sowing seeds of improved varieties  
 (4) None of the above

77. Hybrid of potato and tomato is  
 (1) Tomato (2) Pomato  
 (3) Potamoto (4) None of these
78. 'Remei' variety, which is the result of mutation, belongs to  
 (1) Wheat (2) Rice  
 (3) Barley (4) Maize
79. Maximum of our crops are  
 (1) Autopolyploids  
 (2) Allopolyploids  
 (3) Auto-allopolyploids  
 (4) None of these
80. Famous variety Sharbati Sonora of wheat has been produced from Mexican dwarf wheat variety of Sonora-64 by  
 (1) X-rays irradiation  
 (2) Gamma-rays irradiation  
 (3) Hybridization  
 (4) UV-rays irradiation
81. Induced mutations can be maintained through  
 (1) Sexual reproduction  
 (2) Vegetative propagation  
 (3) Hybridization  
 (4) None of these
82. Resistance to different viral and fungal diseases in sugar cane has been introduced from  
 (1) *Saccharum officinarum*  
 (2) *S. munja*  
 (3) *S. spontaneum*  
 (4) All of these
83. An important rice variety, which is widely cultivated in world and has solved food problem in Asia upto great extent, is  
 (1) Dee-geo-woo-gen (2) IR-36  
 (3) Jaya (4) All of these
84. Who is known as father of green revolution ?  
 (1) Vavilov (2) N. Borlaug  
 (3) Swaminathan (4) G.H. Khush
85. Which of the following was awarded Nobel Prize (1970) for Peace for production of highly productive dwarf wheat varieties ?  
 (1) Borlaug  
 (2) Vavilov  
 (3) M.S. Swaminathan  
 (4) None of these
86. Father of green revolution in India is  
 (1) B.P. Pal  
 (2) M.S. Swaminathan  
 (3) T.S. Venkatraman  
 (4) Chaudhary Ram Dhan
87. Resistance to potato virus-X was conferred upon potato from  
 (1) *Solanum demissum*  
 (2) *Solanum stoloniferum*  
 (3) *Solanum spergazzani*  
 (4) *Solanum ocaule*
88. IR-36 variety of rice is highly resistant to frassy shoot virus. The resistance to this virus in IR-36 has been contributed by  
 (1) *Oryza nivara* (2) *O. sativa*  
 (3) Norin-10 (4) Dee-geo-woo-gen
89. RR-21 is high yielding variety of  
 (1) Rice (2) Wheat  
 (3) Sugar cane (4) Gram
90. Norin-10 gene is  
 (1) Dwarf gene of wheat  
 (2) Dwarf gene of rice  
 (3) Dwarf gene of tomato  
 (4) Smut resistant gene of wheat
91. 'Golden rice' or 'Miracle rice' is transgenic rice rich in  
 (1) Vitamin B and iron  
 (2) Vitamin A and iron  
 (3) Vitamin A and Vitamin B  
 (4) Iron
92. 'Golden Sela' rice is enriched in  
 (1)  $\beta$ -carotene (2) Lysine  
 (3) Vitamin C (4) Iron
93. High content of lysine is present in  
 (1) Wheat (2) Apple  
 (3) Maize (4) Banana

## Assertion-Reason Type Questions (For AIIMS)

Each of the questions given below consists of two statements, an assertion (A) and reason (R). Select the number corresponding to the appropriate alternative as follows

- (1) If both A and R are true and R is the correct explanation of A, then mark 1
  - (2) If both A and R are true but R is not the correct explanation of A, then mark 2
  - (3) If A is true but R is false, then mark 3
  - (4) If both A and R are false, then mark 4
1. A. Independent assortment of characters is seen widely in both plants and animals.  
R. Genes which are linked, fails to separate from each other during crossing over.
  2. A. Reciprocal cross is always between non-homologous chromosomes.  
R. Reciprocal cross leads to variations in the hybrid.
  3. A. Heterosis is seen in all sexually reproducing plants.  
R. Heterosis is due to crossing over.
  4. A. Mendel succeeded in his hybridization experiments.  
R. Mendel chose Pea plant which is cleistogamous.
  5. A. The first meiotic division is known as heterotypic division.  
R. The first division of meiosis results in reduced number of chromosome.
  6. A. A cross between progeny and its recessive homozygous parent is called test cross.  
R. All the test cross are back cross.
  7. A. Gametes always carry only one allele of a trait even in case of multiple alleles.  
R. Law of segregation is universal.
  8. A. Heterosis is defined as superiority of F<sub>1</sub> hybrid either of two genetically dissimilar parents.  
R. Heterosis can be measured in terms of growth rate, size and yield.
  9. A. Each gamete has only one allele for each trait.  
R. It is true for single trait crosses only.
  10. A. Clones are a group of organism of identical genotype, produced by same kind of sexual reproduction and same sexual processes.  
R. These are prepared by a group of cells descended from many cells or by inbreeding of a completely heterozygous line.
  11. A. A woman of blood group AB when married to an O group man will never get an AB group child.  
R. Blood group O gene is dominant over A, B or AB.
  12. A. Epistasis is suppression of one gene by another gene.  
R. In epistasis the gene suppressed is always a dominant one.
  13. A. Mutations may lead to the origin of species.  
R. Mutations are rarely harmful.
  14. A. Several diseases in humans are examples of aneuploidy.  
R. Aneuploidy is caused due to disjunction of chromatids.
  15. A. Criss-cross inheritance is due to X chromosomes.  
R. A X-linked character of a male is passed on to the son of the daughter.
  16. A. New World cotton is an allotetraploid.  
R. *Gossypium barbadense* and *G. hirsutum* originated in American continent.
  17. A. The variability of genes in the gene pool is the raw material of evolutionary change.  
R. According to Hardy-Weinberg law, the frequencies of particular genes and alleles tend to change.
  18. A. The person heterozygous for sickle-cell trait produces both normal (Hb<sup>A</sup>) and abnormal haemoglobin (Hb<sup>S</sup>).  
R. The normal allele and the sickle alleles are codominant.
  19. A. In humans, the gamete contributed by the male determines whether the child produced will be male or female.  
R. Sex in humans is a polygenic trait depending upon a cumulative effect of some genes on X-chromosome and some on Y-chromosome.
  20. A. Phenylketonuria is an inborn error of metabolism.  
R. Phenylalanine is not converted into tyrosine in individuals suffering from phenylketonuria.
  21. A. Haemophilia is a sex linked recessive disease.  
R. It is predominantly found in females.
  22. A. The frequency of crossing over is directly proportional to the distance between two genes.  
R. The frequency of crossing over never exceeds 50% in case of linked gene.
  23. A. Cystic fibrosis is a recessive autosomal disorder.  
R. All genetical disorders show criss-cross inheritance.
  24. A. Monosomic is an aneuploid, in which a chromosome is deficient of its homologous.  
R. Aneuploidy arise due to nondisjunction of chromosome at anaphase I.

25. **A.** Haemophilia is a genetic disorder generally found in males.  
**R.** Haemophilia is a sex-linked trait and the gene for haemophilia is located on the Y-chromosome.
26. **A.** Genetic drift accentuates speciation.  
**R.** Hardy-Weinberg equilibrium seems to retard speciation.
27. **A.** Chromatid is one of a pair of replicated chromosomes found during the prophase and metaphase stages of mitosis and meiosis.  
**R.** Chromatin is classified as euchromatin or heterochromatin on the basis of staining properties. Euchromatin is thought to be actively involved in transcription and, therefore, protein synthesis, while heterochromatin is inactive.
28. **A.** Lampbrush chromosomes are found in the oocytes of certain animals during the prophase of meiosis. Such chromosomes consist of two central strands along which fine loops extend laterally.  
**R.** The loops are thought to be active regions of RNA synthesis.
29. **A.** Giant chromosomes are present in *Drosophila* in its salivary glands.  
**R.** Giant chromosomes occurs in human beings also.
30. **A.** The two strands of a DNA are antiparallel.  
**R.** The deoxyribose molecules of the two strands are oriented in a reverse direction.
31. **A.** The enzyme DNA polymerase III synthesises deoxyribonucleotides on both the arms of a DNA.  
**R.** The enzyme has the ability to synthesise deoxyribonucleotides in  $3' \rightarrow 5'$  as well as  $5' \rightarrow 3'$  directions.
32. **A.** The template strand of DNA can synthesise RNA primer in  $5' \rightarrow 3'$  direction.  
**R.** The DNA dependent RNA polymerase has the ability to synthesise ribonucleotides.
33. **A.** The genetic codes are ambiguous.  
**R.** The genetic codes of mitochondrial RNA are similar to those of the messenger RNA.
34. **A.** Replication of DNA in prokaryotes is preceded by a single point of origin.  
**R.** Cairns used radioisotope to study replication of DNA.
35. **A.** Informosomes are long-lived.  
**R.** mRNA is protected by a protein coat.
36. **A.** Several polypeptide chains can be synthesised on a mRNA.  
**R.** Only one ribosome can move over a mRNA at a time.
37. **A.** tRNAs are the smallest RNAs.  
**R.** tRNAs shuttle between the ribosomes and the cytoplasm.
38. **A.** Protein synthesis a very rapid process.  
**R.** It takes 2 hours in prokaryotes.
39. **A.** The base ratio  $(A + T)/(G + C)$  is constant in a particular organism.  
**R.** Th ratio is, however, different in the different species.
40. **A.** The metabolism in a living system is totally enzyme controlled process.  
**R.** The heterocatalytic function of DNA is to regulate physiological processes in living world.
41. **A.** Replication and transcription occur in the nucleus but translation occurs in the cytoplasm.  
**R.** mRNA is transferred from the nucleus into the cytoplasm where ribosomes and amino acids are available for protein synthesis.
42. **A.** Comparative biochemistry provides a strong evidence in favour of a common ancestry of living beings.  
**R.** Genetic code is universal.
43. **A.** X-ray crystallography is the best technique to determine the structure of proteins.  
**R.** The spatial arrangement of atoms in molecular structure of macromolecules requires 3-D imaging probe.
44. **A.** According to Chargaff, amount of purine and pyrimidine content of a double stranded DNA is equal.  
**R.** Chargaff's rule is applicable to only double stranded DNA.
45. **A.** Amber codon is a termination codon.  
**R.** Protein synthesis stops at the terminator codon of mRNA whether the protein is complete or not.
46. **A.** DNA code is copied in the synthesis of tRNA  
**R.** tRNA moves out of the nucleus and forms and template after attaching on the ribosomes.
47. **A.** Meselson and Stahl tested the Watson and Crick theory of DNA replication.  
**R.** They confirmed the mechanism of DNA replication by using the isotopic and centrifugation techniques.

48. **A.** Adenine cannot base pair with cytosine.  
**R.** As there would be two hydrogen atoms near one of the bonding positions and none at the other.
49. **A.** The *mRNA* attaches itself to the ribosome via its 3' end.  
**R.** The *mRNA* has 5'-capsular nucleotide and bases of lagging sequence.
50. **A.** In a DNA molecule the total quantity of purines equals the total quantity of pyrimidines.  
**R.** Adenine pairs with thymine, and cytosine pairs with guanine.
51. **A.** DNA synthesis occurs in G<sub>1</sub> and G<sub>2</sub> periods of cell cycle.  
**R.** During, G<sub>1</sub> and G<sub>2</sub> phase the DNA contents become double.
52. **A.** rRNAs constitute 80% of the total RNAs of a cell.  
**R.** rRNAs are the longest of the RNAs.
53. **A.** Cotton plants have been found to survive against boll worm.  
**R.** Cotton is transgenic.
54. **A.** Hybridoma is very important in micropropagation.  
**R.** It is essential for production of vaccines.



# ANSWERS TO ASSIGNMENT

## PRINCIPLES OF INHERITANCE & VARIATION

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

201	(4)	202	(3)	203	(1)	204	(3)	205	(1)
206	(4)	207	(1)	208	(1)	209	(4)	210	(1)
211	(3)	212	(3)	213	(2)	214	(1)	215	(2)
216	(4)								

### **MOLECULAR BASIS OF INHERITANCE**

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

### **STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION**

1	(1)	2	(1)	3	(1)	4	(3)	5	(3)
6	(4)	7	(4)	8	(3)	9	(3)	10	(3)
11	(2)	12	(4)	13	(1)	14	(3)	15	(2)

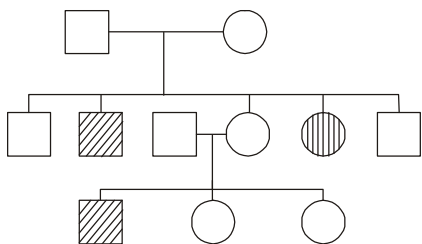
16	(1)	17	(4)	18	(4)	19	(3)	20	(2)
21	(3)	22	(3)	23	(3)	24	(3)	25	(1)
26	(3)	27	(2)	28	(3)	29	(4)	30	(4)
31	(1)	32	(2)	33	(1)	34	(4)	35	(3)
36	(1)	37	(2)	38	(4)	39	(1)	40	(4)
41	(2)	42	(2)	43	(4)	44	(1)	45	(3)
46	(3)	47	(4)	48	(2)	49	(1)	50	(1)
51	(3)	52	(1)	53	(2)	54	(3)	55	(3)
56	(1)	57	(3)	58	(3)	59	(4)	60	(1)
61	(3)	62	(4)	63	(1)	64	(2)	65	(1)
66	(2)	67	(3)	68	(1)	69	(1)	70	(2)
71	(3)	72	(4)	73	(4)	74	(4)	75	(2)
76	(3)	77	(2)	78	(2)	79	(1)	80	(2)
81	(2)	82	(3)	83	(2)	84	(2)	85	(1)
86	(2)	87	(4)	88	(1)	89	(2)	90	(1)
91	(2)	92	(1)	93	(1)				

### ASSERTION-REASON TYPE QUESTIONS (FOR AIIMS)

1	(3)	2	(4)	3	(4)	4	(1)	5	(2)
6	(2)	7	(1)	8	(2)	9	(3)	10	(4)
11	(3)	12	(2)	13	(3)	14	(3)	15	(1)
16	(1)	17	(3)	18	(1)	19	(3)	20	(1)
21	(3)	22	(2)	23	(3)	24	(3)	25	(3)
26	(2)	27	(2)	28	(1)	29	(2)	30	(1)
31	(3)	32	(1)	33	(4)	34	(2)	35	(1)
36	(3)	37	(2)	38	(3)	39	(2)	40	(2)
41	(1)	42	(2)	43	(1)	44	(2)	45	(1)
46	(4)	47	(1)	48	(1)	49	(4)	50	(1)
51	(4)	52	(2)	53	(4)	54	(4)		

**CBSE - PMT**

1. What is not true for genetic code?
  - (1) It is unambiguous
  - (2) A codon in mRNA is read in a non-contiguous fashion
  - (3) It is nearly universal
  - (4) It is degenerate
2. Removal of introns and joining the exons in a defined order in a transcription unit is called
  - (1) Capping
  - (2) Splicing
  - (3) Tailing
  - (4) Transformation
3. Semiconservative replication of DNA was first demonstrated in
  - (1) *Salmonella typhimurium*
  - (2) *Drosophila melanogaster*
  - (3) *Escherichia coli*
  - (4) *Streptococcus pneumoniae*
4. Whose experiments cracked the DNA and discovered unequivocally that a genetic code is a "triplet"?
  - (1) Beadle and Tatum
  - (2) Nirenberg and Mathaei
  - (3) Hershey and Chase
  - (4) Morgan and Sturtevant
5. Point mutation involves
  - (1) Deletion
  - (2) Insertion
  - (3) Change in single base pair
  - (4) Duplication
6. 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 chain of haemoglobin
  - (4) caused by a change in a single base pair of DNA
7. 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
8. 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
  9. 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
  10. Somaclones are obtained by
    - (1) Genetic engineering
    - (2) Tissue culture
    - (3) Plant breeding
    - (4) Irradiation
  11. Which one is the wrong pairing for the disease and its causal organism ?
    - (1) Root-knot of vegetables - *Meloidogyne sp*
    - (2) Late blight of potato - *Alternaria solani*
    - (3) Black rust of wheat - *Puccinia graminis*
    - (4) Loose smut of wheat - *Ustilago nuda*
  12. Which of the following is not used as a biopesticide?
    - (1) *Xanthomonas campestris*
    - (2) *Bacillus thuringiensis*
    - (3) *Trichoderma harzianum*
    - (4) Nuclear Polyhedrosis Virus (NPV)
  13. Which of the following plant species you would select for the production of bioethanol ?
    - (1) *Jatropha*
    - (2) *Brassica*
    - (3) *Zea mays*
    - (4) *Pongamia*

14. Polysome is formed by
- (1) Several ribosomes attached to a single mRNA
  - (2) Many ribosomes attached to a strand of endoplasmic reticulum
  - (3) A ribosome with several subunits
  - (4) Ribosomes attached to each other in a linear arrangement
15. The two sub-units of ribosome remain united at a critical ion level of
- (1) Copper
  - (2) Manganese
  - (3) Magnesium
  - (4) Calcium
16. In the DNA molecule
- (1) the total amount of purine nucleotides and pyrimidine nucleotides is not always equal
  - (2) there are two strand which run parallel in the 5' → 3' direction
  - (3) the proportion of Adenine in relation to thymine varies with the organism
  - (4) there are two strands which run antiparallel-one in 5' → 3' direction and other in 3' → 5'
17. Which one of the following pairs of codons is *correctly* matched with their function or the signal for the particular amino acid ?
- (1) GUU, GCU - Alanine
  - (2) UAG, UGA - Stop
  - (3) AUG, ACG - Start/Methionine
  - (4) UUA, UCA - Leucine
18. Which one of the following scientist's name is *correctly* matched with the theory put forth by him?
- (1) Weismann - Theory of continuity of Germplasm
  - (2) Pasteur - Inheritance of acquired characters
  - (3) de Vries - Natural selection
  - (4) Mendel - Theory of Pangenesis
19. Which one of the following pairs of nitrogenous bases of nucleic acids, is wrongly matched with the category mentioned against it ?
- (1) Thymine, Uracil - *Pyrimidines*
  - (2) Uracil, Cytosine - *Pyrimidines*
  - (3) Guanine, Adenine - *Purines*
  - (4) Adenine, Thymine - *Purines*
20. Main objective of production/use of herbicide resistant GM crops is to
- (1) eliminate weeds from the field without the use of manual labor
  - (2) eliminate weeds from the field without the use of herbicides
  - (3) encourage eco-friendly herbicides
  - (4) reduce herbicide accumulation in food articles for health safety
21. Human insulin is being commercially produced from transgenic species of
- (1) *Escherichia*
  - (2) *Mycobacterium*
  - (3) *Rhizobium*
  - (4) *Saccharomyces*
22. Which one of the following conditions in humans is correctly matched with its chromosomal abnormality/linkage ?
- (1) Klinefelter's syndrome -- 44 autosomes + XXY
  - (2) Colour blindness -- Y-linked
  - (3) Erythroblastosis foetalis -- X-linked
  - (4) Down syndrome -- 44 autosomes + XO
23. What is antisense technology ?
- (1) A cell displaying a foreign antigen used for synthesis of antigens
  - (2) Production of somaclonal variants in tissue cultures
  - (3) When a piece of RNA that is complementary in sequence is used to stop expression of a specific gene
  - (4) RNA polymerase producing DNA
24. Haploids are more suitable for mutation studies than the diploids. This is because
- (1) haploids are reproductively more stable than diploids
  - (2) mutagens penetrate in haploids more effectively than in diploids
  - (3) haploids are more abundant in nature than diploids
  - (4) all mutations, whether dominant or recessive are expressed in haploids
25. The linking of antibiotic resistance gene with the plasmid vector became possible with
- (1) DNA ligase
  - (2) Endonucleases
  - (3) DNA polymerase
  - (4) Exonucleases



26. A common test to find the genotype of a hybrid is by
- (1) Crossing of one F<sub>2</sub> progeny with female parent
  - (2) Studying the sexual behaviour of F<sub>1</sub> progenies
  - (3) Crossing of one F<sub>1</sub> progeny with male parent
  - (4) Crossing of one F<sub>2</sub> progeny with male parent
27. The Okazaki fragments in DNA chain growth :
- (1) Polymerize in the 3' - to -5' direction and forms replication fork
  - (2) Prove semi-conservative nature of DNA replication
  - (3) Polymerize in the 5' - to -3' direction and explain 3' - to -5' DNA replication
  - (4) Result in transcription
28. The length of DNA molecule greatly exceeds the dimensions of the nucleus in eukaryotic cells. How is this DNA accommodated ?
- (1) Super-coiling in nucleosomes
  - (2) DNase digestion
  - (3) Through elimination of repetitive DNA
  - (4) Deletion of non-essential genes
29. A sequential expression of a set of human genes occurs when a steroid molecule binds to the
- (1) Messenger RNA
  - (2) DNA sequence
  - (3) Ribosome
  - (4) Transfer RNA
30. During transcription, RNA polymerase holoenzyme binds to a gene promoter and assumes a saddle-like structure. What is it's DNA-binding sequence?
- (1) AATT
  - (2) CACC
  - (3) TATA
  - (4) TTAA
31. A One gene - one enzyme relationship was established for the first time in
- (1) *Salmonella typhimurium*
  - (2) *Escherichia Coli*
  - (3) *Diplococcus pneumoniae*
  - (4) *Neurospora crassa*
32. Two genes R and ;Y are located very close on the chromosomal linkage map of maize plant. When RRY<sub>2</sub> and rry<sub>2</sub> genotypes are hybridized, the F<sub>2</sub> segregation will show
- (1) Segregation in the expected 9 : 3 : 3 : 1 ratio
  - (2) Segregation in 3 : 1 ratio
  - (3) Higher number of the parental types
  - (4) Higher number of the recombinant types
33. Inheritance of skin colour in humans is an example of
- (1) Point mutation
  - (2) Polygenic inheritance
  - (3) Codominance
  - (4) Chromosomal aberration
34. Telomere repetitive DNA sequence control the function of eukaryote chromosomes because they
- (1) Are RNA transcription initiator
  - (2) Help chromosome pairing
  - (3) Prevent chromosome loss
  - (4) Act as replicons
35. 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<sub>1</sub> generation ?
- (1) 9 : 1
  - (2) 1 : 3
  - (3) 3 : 1
  - (4) 50 : 50
36. A human male produces sperms with the genotypes AB, Ab, aB, and ab pertaining to two diallelic characters in equal proportions. What is the corresponding genotype of this person ?
- (1) Aabb
  - (2) AABb
  - (3) AABB
  - (4) AaBb
37. The two polynucleotide chains in DNA are
- (1) Discontinuous
  - (2) Antiparallel
  - (3) Semiconservative
  - (4) Parallel
38. In this hexaploid wheat, the haploid (*n*) and basic (*x*) numbers of chromosome are :
- (1) *n* = 21 and *x* = 21
  - (2) *n* = 21 and *x* = 14
  - (3) *n* = 21 and *x* = 7
  - (4) *n* = 7 and *x* = 21
39. A genetically engineered micro-organism used successfully in bioremediation of oil spills is a species of :
- (1) *Trichoderma*
  - (2) *Xanthomonas*
  - (3) *Bacillus*
  - (4) *Pseudomonas*
40. In maize, hybrid vigour is exploited by
- (1) Crossing of two inbred parental lines
  - (2) Harvesting seeds from the most productive plants
  - (3) Inducing mutations
  - (4) Bombarding the seeds with DNA
41. Restriction endonuclease
- (1) restricts the synthesis of DNA inside the nucleus
  - (2) synthesizes DNA
  - (3) cuts the DNA molecule randomly
  - (4) cuts the DNA molecule at specific sites

42. If a colourblind woman marries a normal visioned man, their sons will be  
 (1) three-fourths colourblind and one-fourth normal  
 (2) all colourblind  
 (3) all normal visioned  
 (4) one-half colourblind and one-half normal
43. Cri-du-chat syndrome in humans is caused by the  
 (1) loss of half of the long arm of chromosome 5  
 (2) trisomy of 21<sup>st</sup> chromosome  
 (3) fertilization of an XX egg by a normal Y-bearing sperm  
 (4) loss of half of the short arm of chromosome 5
44. In which mode of inheritance do you expect more maternal influence among the offspring?  
 (1) Y-linked (2) X-linked  
 (3) Autosomal (4) Cytoplasmic
45. How many different kinds of gametes will be produced by a plant having the genotype AABbCC?  
 (1) Nine (2) Two  
 (3) Three (4) Four
46. Test cross involves  
 (1) Crossing the F<sub>1</sub> hybrid with a double recessive genotype  
 (2) Crossing between two genotypes with dominant trait  
 (3) Crossing between two genotypes with recessive trait  
 (4) Crossing between two F<sub>1</sub> hybrids
47. Antiparallel strands of a DNA molecule means that  
 (1) The phosphate groups at the start of two DNA strands are in opposite position (pole)  
 (2) One strand turns clockwise  
 (3) One strand turns anti-clockwise  
 (4) The phosphate groups of two DNA strands, at their ends, share the same position
48. One turn of the helix in a B-form DNA is approximately  
 (1) 3.4 nm (2) 2 nm  
 (3) 20 nm (4) 0.34 nm
49. Phenotype of an organism is the result of  
 (1) Environmental changes and sexual dimorphism  
 (2) Genotype and environment interactions  
 (3) Mutations and linkages  
 (4) Cytoplasmic effects and nutrition
50. Which one of the following is the most suitable medium for culture of *Drosophila melanogaster* ?  
 (1) Ripe banana (2) Cow dung  
 (3) Moist bread (4) Agar agar
51. Which antibiotic inhibits interaction between tRNA and mRNA during bacterial protein synthesis ?  
 (1) Streptomycin (2) Tetracycline  
 (3) Erythromycin (4) Neomycin
52. Both sickle cell anemia and Huntington's chorea are  
 (1) Pollutant-induced disorders  
 (2) Virus-related diseases  
 (3) Bacteria-related diseases  
 (4) Congenital disorders
53. Sickle cell anemia has not been eliminated form t  
 (1) It provides immunity against malaria  
 (2) It is controlled by dominant genes  
 (3) It is controlled by recessive genes  
 (4) It is not a fatal disease
54. Amino acid sequence, in protein synthesis is decided by the sequence of  
 (1) cDNA (2) rRNA  
 (3) tRNA (4) mRNA
55. Two microbes found to be very useful in genetic engineering are  
 (1) *Diplococcus* sp. and *Pseudomonas* sp.  
 (2) Crown gall bacterium and *Caenorhabditis elegans*  
 (3) *Escherichia coli* and *Agrobacterium tumefaciens*  
 (4) *Vibrio cholerae* and a tailed bacteriophage
56. Which one of the following is an example of polygenic inheritance ?  
 (1) Pod shape in garden pea  
 (2) Skin colour in humans  
 (3) Flower colour in *Mirabilis jalapa*  
 (4) Production of male honey bee
57. In Mendel's experiments with garden pea, round seed shape (RR) was dominant over wrinkled seeds (rr), yellow cotyledon (YY) was dominant over green cotyledon (yy). What are the expected phenotypes in the F<sub>2</sub> generation of the cross RRY Y × rryy ?  
 (1) Only wrinkled seeds with green cotyledons  
 (2) Round seeds with yellow cotyledons and wrinkled seeds with yellow cotyledons

- (3) Only round seeds with green cotyledons  
 (4) Only wrinkled seeds with yellow cotyledons
58. Golden rice is a promising transgenic crop. When released for cultivation, it will help in
- (1) herbicide tolerance  
 (2) producing a petrol-like fuel from rice  
 (3) alleviation of vitamin A deficiency  
 (4) pest resistance
59. In maize, hybrid vigour is exploited by
- (1) harvesting seeds from the most productive plants  
 (2) inducing mutations  
 (3) bombarding the protoplast with DNA  
 (4) crossing of two inbred parental lines
60. *Triticale*, the first man-made cereal crop, has been obtained by crossing wheat with
- (1) Sugarcane                      (2) Barley  
 (3) Rye                              (4) Pearl millet
61. *E.coli* cells with a mutated *z* gene of the *lac* operon cannot grow in medium containing only lactose as the source of energy because :
- (1) They cannot synthesize functional betagalactosidase  
 (2) They cannot transport lactose from the medium into the cell  
 (3) The *lac* operon is constitutively active in these cells  
 (4) In the presence of glucose, *E.coli* do not utilize lactose
62. At a particular locus, frequency of 'A' allele is 0.6 and that of 'a' is 0.4. What would be the frequency of heterozygotes in a random mating population at equilibrium ?
- (1) 0.24                              (2) 0.16  
 (3) 0.48                              (4) 0.36
63. Which one of the following makes use of RNA as a template to synthesize DNA ?
- (1) DNA dependant RNA polymerase  
 (2) DNA polymerase  
 (3) Reverse transcriptase  
 (4) RNA polymerase
64. Nucleotides are building blocks of nucleic acids. Each nucleotide is a composite molecule formed by :
- (1) Base-sugar-OH  
 (2) Base-sugar-phosphate  
 (3) Sugar-phosphate  
 (4) (Base-sugar-phosphate)<sub>n</sub>
65. Which of the following is generally used for induced mutagenesis in crop plants ?
- (1) Gamma rays (from cobalt 60)  
 (2) Alpha particles  
 (3) X rays  
 (4) UV (260nm)
66. Protein synthesis in an animal cell occurs :
- (1) On ribosomes present in cytoplasm as well as in mitochondria  
 (2) On ribosomes present in the nucleolus as well as in cytoplasm  
 (3) Only on ribosomes attached to the nuclear envelope and endoplasmic reticulum  
 (4) Only on the ribosomes present in cytosol
67. Telomerase is an enzyme which is a
- (1) RNA                              (2) Ribonucleoprotein  
 (3) Repetitive DNA              (4) Simple protein
68. 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
69. Which of the following is not a hereditary disease ?
- (1) Haemophilia                      (2) Cretinism  
 (3) Cystic fibrosis                      (4) Thalassaemia
70. 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 of normal vision  
 (3) Will be partially colour blind since he is heterozygous for the colour blind mutant allele  
 (4) Must be colour blind
71. Production of a human protein in bacteria by genetic engineering is possible because :
- (1) Bacterial cell can carry out the RNA splicing reactions  
 (2) The mechanism of gene regulation is identical in humans and bacteria  
 (3) The human chromosome can replicate in bacterial cell  
 (4) The genetic code is universal
72. During transcription holoenzyme RNA polymerase





- binds to a DNA sequence and the DNA assumes a saddle like structure at that point. What is that sequence called ?
- (1) CAAT box           (2) GGTT box  
(3) AAAT box           (4) TATA box
73. 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 mutation  
(4) A greater proportion of girls die in infancy
74. A woman with 47 chromosomes due to three copies of chromosome 21 is characterized by :
- (1) Turner syndrome (2) Down syndrome  
(3) Superfemaleness (4) Triploidy
75. A man and a woman, who do not show any apparent signs of a certain inherited disease, have seven children (2 daughters and 5 sons). Three of the sons suffer from the given disease but none of the daughters are affected. Which of the following mode of inheritance do you suggest for this disease ?
- (1) Sex-limited recessive  
(2) Autosomal dominant  
(3) Sex-linked recessive  
(4) Sex-linked dominant
76. Genes for cytoplasmic male sterility in plants are generally located in :
- (1) Nuclear genome  
(2) Chloroplast genome  
(3) Cytosol  
(4) Mitochondrial genome
77. *Bacillus thuringiensis* (Bt) strains have been used for designing novel :
- (1) Bioinsecticidal plants  
(2) Bio-mineralization processes  
(3) Biofertilizers  
(4) Bio-metallurgical techniques
78. The name of Norman Borlaug is associated with :
- (1) Green Revolution (2) White Revolution  
(3) Yellow Revolution (4) Blue Revolution
79. Three crops that contribute maximum to global food grain production are :
- (1) Wheat, rice and maize  
(2) Rice, maize and sorghum  
(3) Wheat, maize and sorghum  
(4) Wheat, rice and barley
80. The world's highly prized wool yielding 'Pashmina' breed is :
- (1) Kashmir sheep - Afgan sheep cross  
(2) Goat  
(3) Sheep  
(4) Goat-sheep cross
81. Which form of RNA has a structure resembling clover leaf ?
- (1) tRNA                   (2) rRNA  
(3) hnRNA               (4) mRNA
82. The telomeres of eukaryotic chromosomes consist of short sequences
- (1) Guanine rich repeats  
(2) Thymine rich repeats  
(3) Cytosine rich repeats  
(4) Adenine rich repeats
83. One of the parents of a cross has a mutation in its mitochondria. In that cross, that parent is taken as a male. During segregation of F<sub>2</sub> progenies that mutation is found in
- (1) Fifty percent of the progenies  
(2) One-third of the progenies  
(3) None of the progenies  
(4) All the progenies
84. Cancer cells are more easily damaged by radiation than normal cells because they are
- (1) Non-dividing  
(2) Starved of mutation  
(3) Undergoing rapid division  
(4) Different in structure
85. DNA fingerprinting refers to
- (1) Techniques used for identification of fingerprints of individuals  
(2) Molecular analysis of profiles of DNA samples  
(3) Analysis of DNA samples using imprinting devices  
(4) Techniques used for molecular analysis of different specimens of DNA

86. What kind of evidence suggested that man is more closely related with chimpanzee than with other hominoid apes
- (1) Evidence from DNA extracted from sex chromosomes, autosomes and mitochondria
  - (2) Evidence from DNA from sex chromosomes only
  - (3) Comparison of chromosomes morphology only
  - (4) Evidence from fossil remains, and the fossil mitochondria DNA alone
87. In a mutational event, when adenine is replaced by guanine, it is a case of
- (1) Transversion      (2) Frameshift mutation
  - (3) Transcription    (4) Transition
88. During transcription, if the nucleotide sequence of the DNA strand that is being coded as ATACG, then the nucleotide sequence in the mRNA would be
- (1) USTGC              (2) TATGC
  - (3) TACTGG          (4) UAUGC
89. 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
90. The recessive genes located on X-chromosome in humans are always
- (1) Expressed in females
  - (2) Lethal
  - (3) Sub-lethal
  - (4) Expressed in males
91. Crossing over that results in genetic recombination in higher organisms occurs between
- (1) Two different bivalents
  - (2) Sister chromatids of a bivalent
  - (3) Non-sister chromatids of a bivalent
  - (4) Two daughter nuclei
92. Restriction endonucleases
- (1) Are synthesized by bacteria as part of their defense mechanism
  - (2) Are present in mammalian cells for degradation of DNA when the cell dies
  - (3) Are used in genetic engineering for ligating two DNA molecules
  - (4) Are used for *in vitro* DNA synthesis
93. Lack of independent assortment of two genes A and B in fruit fly *Drosophila* is due to
- (1) Crossing over      (2) Repulsion
  - (3) Recombination    (4) Linkage
94. 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
95. A nutritionally wild type organism, which does not require any additional growth supplement is known as
- (1) Prototroph          (2) Phenotype
  - (3) Holotype          (4) Holotype
96. After a mutation at a genetic locus the character of an organism changes due to the change in
- (1) RNA transcription pattern
  - (2) Protein structure
  - (3) DNA replication
  - (4) Protein synthesis pattern
97. During replication of a bacterial chromosome DNA synthesis starts from a replication origin site and
- (1) Moves in bi-directional way
  - (2) RNA primers are involved
  - (3) Is facilitated by telomerase
  - (4) Moves in one direction of the site
98. 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 offspring 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
99. A male human is heterozygous for autosomal genes *A* and *B* and is also hemizygous for hemophilic gene *h*. What proportion of his sperms will be *abh* ?
- (1)  $\frac{1}{4}$                       (2)  $\frac{1}{8}$
  - (3)  $\frac{1}{32}$                      (4)  $\frac{1}{16}$



100. The following ratio is generally constant for a given species  
 (1)  $A + C / T + G$     (2)  $A + G / C + T$   
 (3)  $T + C / G + A$     (4)  $G + C / A + T$
101. The technique of obtaining large number of plantlets by tissue culture method is called  
 (1) Macropropagation    (2) Plantlet culture  
 (3) Organ culture    (4) Micropropagation
102. Which one of the following pairs is not correctly matched ?  
 (1) *Rhizobium* – Biofertilizer  
 (2) *Streptomyces* – Antibiotic  
 (3) *Serratia* – Drug addiction  
 (4) *Spirulina* – Single cell protein
103. In transgenics, expression of transgene in target tissue is determined by  
 (1) Reporter    (2) Enhancer  
 (3) Transgene    (4) Promoter
104. The *Ti* plasmid, is often used for making transgenic plants. This plasmid is found in  
 (1) Yeast as a 2  $\mu$ m plasmid  
 (2) *Azotobacter*  
 (3) *Rhizobium* of the roots of leguminous plants  
 (4) *Agrobacterium*
105. India's wheat yield revolution in the 1960s was possible primarily due to  
 (1) Quantitative trait mutations  
 (2) Hybrid seeds  
 (3) Increased chlorophyll content  
 (4) Mutations resulting in plant height reduction
106. The most likely reason for the development of resistance against pesticides in insects damaging a crop is  
 (1) Acquired heritable changes  
 (2) Random mutations  
 (3) Genetic recombination  
 (4) Directed mutations
107. Which one of the following cannot be explained on the basis of Mendel's Law of Dominance ?  
 (1) Factors occur in pairs  
 (2) The discrete unit controlling a particular character is called a factor  
 (3) Out of one pair of factors one is dominant, and the other recessive  
 (4) Alleles do not show any blending and both the characters recover as such in  $F_2$  generation
108. The genotype of a plant showing the dominant phenotype can be determined by :  
 (1) Back cross    (2) Test cross  
 (3) Dihybrid cross    (4) Pedigree analysis
109. The one aspect which is **not** a salient feature of genetic code, is its being :  
 (1) Specific    (2) Degenerate  
 (3) Ambiguous    (4) Universal
110. Satellite DNA is useful tool in  
 (1) Genetic engineering  
 (2) Organ transplantation  
 (3) Sex determination  
 (4) Forensic science
111. Which one of the following **does not** follow the central dogma of molecular biology ?  
 (1) HIV    (2) Pea  
 (3) *Mucor*    (4) *Chlamydomonas*
112. 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) Two    (2) Three  
 (3) One    (4) Four
113. Select the *correct* statement from the ones given below with respect to dihybrid cross.  
 (1) Tightly linked genes on the same chromosome show very few recombinations  
 (2) Tightly linked genes on the same chromosome show higher recombinations  
 (3) Genes far apart on the same chromosome show very few recombinations  
 (4) Genes loosely linked on the same chromosome show similar recombinations as the tightly linked ones
114. Select the *two correct* statements out of the four (a–d) given below about lac operon.  
 (a) Glucose or galactose may bind with the repressor and inactivate it  
 (b) In the absence of lactose the repressor binds with the operator region  
 (c) The *z*-gene codes for permease  
 (d) This was elucidated by Francois Jacob and Jacques Monod
- The correct statements are  
 (1) (a) and (b)    (2) (b) and (c)  
 (3) (a) and (c)    (4) (b) and (d)

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

- (1)  = male affected
- (2)  = mating between relatives
- (3)  = unaffected male
- (4)  = unaffected female

116. DNA or RNA segment tagged with a radioactive molecule is called:

- (1) Plasmid                      (2) Vector
- (3) Probe                        (4) Clone

117. Which one of the following palindromic base sequences in DNA can be easily cut at about the middle but some particular restriction enzyme?

- (1) 5' ————— CACGTA ————— 3'  
3' ————— CTCAGT ————— 5'
- (2) 5' ————— CGTTCG ————— 3'  
3' ————— ATGGTA ————— 5'
- (3) 5' ————— GATATG ————— 3'  
3' ————— CTACTA ————— 5'
- (4) 5' ————— GAATTC ————— 3'  
3' ————— CTTAAG ————— 5'

118. What are those structures that appear as 'beads - on - string' in the chromosomes when viewed under electron microscope ?

- (1) Genes                        (2) Nucleotides
- (3) Nucleosomes                (4) Base pairs

119. 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

120. Removal of introns and joining of exons in a defined order during transcription is called

- (1) Splicing                      (2) Looping
- (3) Inducing                      (4) Slicing

121. Which one of the following is a case of wrong matching ?

- (1) Callus - Unorganised mass of cells produced in tissue culture
- (2) Somatic hybridization - Fusion of two diverse cells
- (3) Vector DNA - Site for t-RNA synthesis
- (4) Micropropagation - In vitro production of plants in large numbers

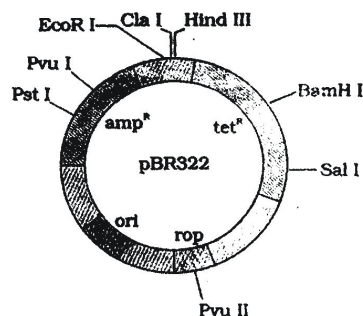
122. Ribosomal RNA is actively synthesized in

- (1) Ribosomes                      (2) Lysosomes
- (3) Nucleolus                      (4) Nucleoplasm

123. Consumption of which one of the following foods can prevent the kind of blindness associated with vitamin 'A' deficiency ?

- (1) Bt-Brinjal
- (2) 'Flaver Savr' tomato
- (3) Canolla
- (4) Golden rice

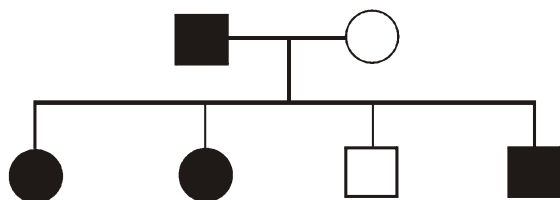
124. The figure below is the diagrammatic representation of the *E.Coli* vector pBR 322. Which one of the given options correctly identifies its certain component (s) ?



- (1) amp<sup>R</sup>, tet<sup>R</sup>- antibiotic resistance genes
- (2) ori-original restriction enzyme
- (3) rop-reduced osmotic pressure
- (4) Hind III, EcoRI-selectable markers

## CBSE - PMT MAINS

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



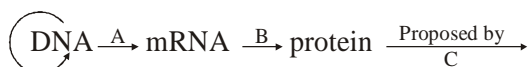
- (1) The female parent is heterozygous  
 (2) The parents could not have had a normal daughter for this character  
 (3) The trait under study could not be colour-blindness  
 (4) The male parent is homozygous dominant
2. In eukaryotic cell transcription, RNA splicing and RNA capping take place inside the  
 (1) Ribosomes (2) Nucleus  
 (3) Dictyosomes (4) ER
3. In *Antirrhinum* two plants with pink flowers were hybridized. The  $F_1$  plants produced red, pink and white flowers in the proportion of 1 red, 2 pink and 1 white. What could be the genotype of the two plants used for hybridization? Red flower colour is determined by  $RR$ , and white by  $rr$  genes.  
 (1)  $rrrr$  (2)  $RR$   
 (3)  $Rr$  (4)  $rr$
4. A cross in which an organism showing a dominant phenotype is crossed with the recessive parent in order to know its genotype is called  
 (1) Monohybrid cross (2) Back cross  
 (3) Test cross (4) Dihybrid cross
5. ABO blood grouping is controlled by gene I which has three alleles and show co-dominance. There are six genotypes. How many phenotypes in all are possible? [ ]  
 (1) Six (2) Three  
 (3) Four (4) Five
6. The fruit fly *Drosophila melanogaster* was found to be very suitable for experimental verification of chromosomal theory of inheritance by Morgan and his colleagues because : [ ]  
 (1) It reproduces parthenogenetically

- (2) A single mating produces two young flies  
 (3) Smaller female is easily recognisable from larger male  
 (4) It completes life cycle in about two weeks
7. The *lac* operon consists of :  
 (1) Four regulatory genes only  
 (2) One regulatory gene and three structural genes  
 (3) Two regulatory genes and two structural genes  
 (4) Three regulatory genes and three structural genes
8. The 3'-5' phosphodiester linkages inside a polynucleotide chain serve to join  
 (1) One DNA strand with the other DNA strand  
 (2) One nucleoside with another nucleoside  
 (3) One nucleotide with another nucleotide  
 (4) One nitrogenous base with pentose sugar
9. 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
10. 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
11. A test cross is carried out to  
 (1) determine whether two species or varieties will breed successfully  
 (2) determine the genotype of a plant at  $F_2$   
 (3) predict whether two traits are linked  
 (4) assess the number of alleles of a gene
12. Green revolution in India occurred during  
 (1) 1950's (2) 1960's  
 (3) 1970's (4) 1980's
13. Which one of the following represents palindromic sequence in DNA ?  
 (1) 5' - GATACC - 3' (2) 5' - GAATTC - 3'  
 3' - CCTAAG - 5' (3) 3' - CTTAAG - 5'



**NEET**

- (3) Selection of superior recombinants  
 (4) Corss - hybridisation among the selected parents
10. Which enzyme/s will be produced in a cell in which there is a nonsense mutation in the *lac γ* gene ?  
 (1) Transacetylase  
 (2) Lactose permease and transacetylase  
 (3) β-galactosidase  
 (4) Lactose permease
11. 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) Partial dominance  
 (2) Complete dominance  
 (3) Codominance  
 (4) Incomplete dominance
12. Variation in gene frequencies within populations can occur by chance rather than by natural selection. This is referred to as  
 (1) Random mating (2) Genetic load  
 (3) Genetic flow (4) Genetic drift
13. The diagram shows an important concept in the genetic implication of DNA. Fill in the blanks A to C.



- (1) A - transcription B - translation C - Francis Crick  
 (2) A - translation B - extension C - Rosalind Franklin  
 (3) A - transcription B - replication C - James Watson  
 (4) A - translation B - transcription C - Erevin Chargaff
14. Which of the following statements is not true of two genes that show 50% recombination frequency?  
 (1) The genes show independent assortment  
 (2) If the genes are present on the same chromosome, they undergo more than one crossovers in every meiosis  
 (3) The genes may be on different chromosomes  
 (4) The genes are tightly linked

1. In a population of 1000 individuals 360 belong to genotype AA, 480 to Aa and the remaining 160 to aa. Based on this data, the frequency of allele A in the population is  
 (1) 0.6 (2) 0.7  
 (3) 0.4 (4) 0.5
2. Fruit colour in squash is an example of  
 (1) Complementary genes  
 (2) Inhibitory genes  
 (3) Recessive epistasis  
 (4) Dominant epistasis
3. The first human hormone produced by recombinant DNA technology is  
 (1) Thyroxin (2) Progesterone  
 (3) Insulin (4) Estrogen
4. Which one of the following is wrongly matched ?  
 (1) Repressor protein-Binds to operator to stop enzyme synthesis  
 (2) Operon-Structural genes, operator and promoter  
 (3) Transcription-Writing information from DNA to t-RNA  
 (4) Translation-Using information in m-RNA to make protein
5. During which phases(s) of cell cycle, amount of DNA in a cell remains at 4C level if the initial amount is denoted as 2C ?  
 (1) Only G<sub>2</sub> (2) G<sub>2</sub> and M  
 (3) G<sub>0</sub> and G<sub>1</sub> (4) G<sub>1</sub> and S
6. Select the correct option

	Direction of RNA synthesis	Direction of reading of the template DNA strand
(1)	5' --- 3'	5' --- 3'
(2)	3' --- 5'	3' --- 5'
(3)	5' --- 3'	3' --- 5'
(4)	3' --- 5'	5' --- 3'

7. An analysis of chromosomal DNA using the Southern hybridization technique does not use  
 (1) Autoradiography (2) PCR  
 (3) Electrophoresis (4) Blotting
8. Person with blood group AB is considered as universal recipient because he has  
 (1) No antigen on RBC and no antibody in the plasma  
 (2) Both A and B antigens in the plasma but no antibodies



- (3) Both A and B antigens on RBC but no antibodies in the plasma  
 (4) Both A and B antibodies in the plasma
9. Commonly used vectors for human genome sequencing are  
 (1) Expression Vectors  
 (2) T/A Cloning Vectors  
 (3) T-DNA  
 (4) BAC and YAC
10. In 'S' phase of the cell cycle  
 (1) Chromosome number is increased  
 (2) Amount of DNA is reduced to half in each cell  
 (3) Amount of DNA doubles in each cell  
 (4) Amount of DNA remains same in each cell
11. A man whose father was colour blind marries a woman who has a colour blind mother and normal father. What percentage of male children of this couple will be colour blind ?  
 (1) 50%                      (2) 75%  
 (3) 25%                      (4) 0%
12. A human female with Turner's syndrome  
 (1) Exhibits male characters  
 (2) Is able to produce children with normal husband  
 (3) Has 45 chromosomes with XO  
 (4) Has one additional X chromosome
13. The enzyme recombinase is required at which stage of meiosis  
 (1) Diplotene      (2) Diakinesis  
 (3) Pachytene    (4) Zygotene
14. Which vector can clone only a small fragment of DNA ?  
 (1) Plasmid  
 (2) Cosmid  
 (3) Bacterial artificial chromosome  
 (4) Yeast artificial chromosome
- (3) Raised in tissue culture  
 (4) Transformed by recombinant DNA technology
2. A sewage treatment process in which a part of decomposer bacteria present in the wastes is recycled into the starting of the process is called:  
 (1) Cyclic treatment  
 (2) Activated sludge treatment  
 (3) Primary treatment  
 (4) Tertiary treatment
3. Polyploidy can be produced artificially by:  
 (1) Colchicine              (2) Inbreeding  
 (3) Line breeding        (4) Self pollination
4. Recombination is involved in the process of:  
 (1) Cytokinesis  
 (2) Spindle formation  
 (3) Crossing over  
 (4) Chromosome duplication
5. A chromosome in which the centromere is situated close to its end so that one arm is very short and the other very long is  
 (1) Acrocentric        (2) Metacentric  
 (3) Sub-metacentric    (4) Telocentric
6. Sickle cell anemia is  
 (1) autosomal dominant inheritance  
 (2) X-linked recessive inheritance  
 (3) autosomal recessive inheritance  
 (4) X-linked dominant inheritance
7. Down's syndrome is due to  
 (1) linkage  
 (2) sex-linked inheritance  
 (3) crossing over  
 (4) non-disjunction of chromosome
8. Beadle and Tatum showed that each kind of mutant bread mould they studied lacked a specific enzyme. Their experiments demonstrated that it needs specific enzymes in order to function  
 (2) genes are made of DNA  
 (3) Enzymes are required to repair damage  
 (4) genes carry information for making proteins
9. mRNA directs the building of proteins through a

**DPMT**

1. Somaclonal variation appears in plants :
- (1) Growing in polluted soil or water  
 (2) Exposed to gamma rays

- sequence of :
- (1) exons                      (2) introns  
(3) codons                      (4) anticodons
10. Diploid cells have :
- (1) two chromosomes  
(2) one set of chromosomes  
(3) two pairs of homologous chromosomes  
(4) two sets of chromosomes
11. The anti-parallel nature of DNA refers to
- (1) its charged phosphate groups  
(2) the formation of hydrogen bonds between bases from opposite strands  
(3) the opposite direction of the two strands  
(4) the pairing of bases on one strand with bases on the other strand
12. Retrovirus contain
- (1) RNA  
(2) DNA  
(3) Both RNA and DNA  
(4) Either DNA or RNA
13. Central dogma was changed due to discovery of the process of
- (1) Reverse transcription  
(2) Replication  
(3) Transcription  
(4) Translation
14. Conservative replication of DNA was proposed by
- (1) Cairns                      (2) Taylor  
(3) Messelson                (4) Stahl
15. Turner syndrome is
- (1) XO                          (2) XXY  
(3) XXX                        (4) XYY
16. Red flower is dominant and white recessive. A cross between heterozygous red flower and white flower produces
- (1) 350 red and 350 white flowers  
(2) 300 red and 100 white flowers  
(3) 100 red and 350 white flowers  
(4) None of these
17. Okazaki fragments formed during                      (3)  
Lethal genes                      (4) Pleiotropic genes
27. Stop codons are
- (1) UAA, UGA, UAC  
(2) UAG, UUU, UGA  
(3) UAA, UGA, UUG  
(4) UAA, UGA, UAG
28. Which is not true about prokaryotes ?
- (1) DNA is double stranded  
(2) DNA is supercoiled  
(3) DNA is complexed with histones  
(4) DNA is in the form of a ring
29. Ratio of progeny when a red coloured heterozygote is crossed with a white coloured plant in which red colour is dominant on white colour
- (1) 1.3 : 1                      (2) 9 : 3 : 3 : 1  
(3) 1 : 1                        (4) 1 : 1 : 1 : 1
30. Repressible enzymes are formed
- (1) In the presence of the inducer  
(2) In the absence of the aporepressor  
(3) In the absence of the corepressor  
(4) All of these
31. Leaf colour in *Mirabilis jalapa* is an example of
- (1) Incomplete dominance  
(2) Co-dominance  
(3) Mendelian inheritance  
(4) Non-Mendelian inheritance
32. Lampbrush chromosomes are seen in
- (1) Pachytene                (2) Diplotene  
(3) Zygotene                (4) Diakinesis
33. The transcription unit is
- (1) Enhance to silencer  
(2) TATA box to initiation codon  
(3) TATA box to stop codon  
(4) GC box to TATA box
34. The gene interaction when one gene masks the effect of a non-allelic gene
- (1) Dominance                (2) Co-dominance  
(3) Epistasis                (4) Hypostasis
35. Down syndrome is due to
- (1) Non disjunction of 13th chromosome  
(2) Deletion from 21st chromosome  
(3) Addition to 21st chromosome  
(4) Non-disjunction of 21st chromosome
36. In eukaryotes basic structural unit made of histone

- and DNA  
 (1) Nucleoid (2) N.O.R.  
 (3) Nucleosome (4) Chromatin
37. Sex chromosomes for the first time was discovered in which plant ?  
 (1) *Coccoloba* (2) *Sphaerocarpus*  
 (3) *Cucurbita* (4) *Cucumis*
38. Two or more codons coding for one amino acid  
 (1) Wobbling of codons  
 (2) Multiplicity of codons  
 (3) Doubling of codons  
 (4) Degeneracy of codons
39. In protoplast fusion which chemical is used  
 (1) Poly Ethylene Glycol  
 (2) Cytokinins  
 (3) IAA  
 (4) NAA
40. Theory of Pangenesis was proposed by  
 (1) Lamarck (2) Darwin  
 (3) Aristotle (4) None of these
41. When purine is replaced by pyrimidine the mutation is termed  
 (1) Transition  
 (2) Nucleic acid substitution  
 (3) Transversion  
 (4) Base pair substitution
42. Restriction endonuclease  
 (1) Cleaves DNA at any site  
 (2) Is non specific in nature  
 (3) Cleaves DNA at any site  
 (4) Both (1) and (2)
43. 1 centimorgan is equal to recombination frequency of  
 (1) 0.02 (2) 0.03  
 (3) 0.001 (4) 0.01
44. When chromosome breaks and the two fragments join together after rotating by 180°, it is termed  
 (1) Inversion (2) Translocation  
 (3) Transversion (4) Transition
45. Which is not a stop codon ? ]
- (1) UAA (2) UAG  
 (3) UGA (4) UGG
46. Which is not a feature of prokaryotes ?  
 (1) Unorganised nucleus  
 (2) DNA associated with histones  
 (3) Absence of membrane bound cell organelles  
 (4) DNA associated with non-histone proteins
47. A group of interbreeding individuals which are reproductively isolated  
 (1) Biological species  
 (2) Synchronic species  
 (3) Sibling species  
 (4) Allopatric species
48. Transcription unit is  
 (1) Enhance to silencer  
 (2) TATA box to initiation codon  
 (3) TATA box to stop codon  
 (4) GC box to TATA box
49. DNA cannot be used directly to synthesise  
 (1) m-RNA (2) r-RNA  
 (3) Protein (4) t-RNA ]
50. Suppression by a non-allelic gene is termed  
 (1) Epistasis (2) Incomplete dominance  
 (3) Both (1) and (2) (4) None of these [DP1]  
 Cross-pollination  
 (2) Wide hybridisation  
 (3) Self-pollination  
 (4) Both (2) and (3)
61. The anticodon of transfer RNA for the messenger RNA codon G-C-A is  
 (1) T-G-A (2) G-U-T  
 (3) A-G-T (4) C-G-U
62. The exchange of segments of non-sister chromatids between chromosomes of a homologous pair is termed  
 (1) Transformation  
 (2) Translocation  
 (3) Crossing over  
 (4) Chromosomal aberration
63. Okazaki is known for his contribution to the understanding of  
 (1) Transcription (2) Translation  
 (3) DNA replication (4) Mutation

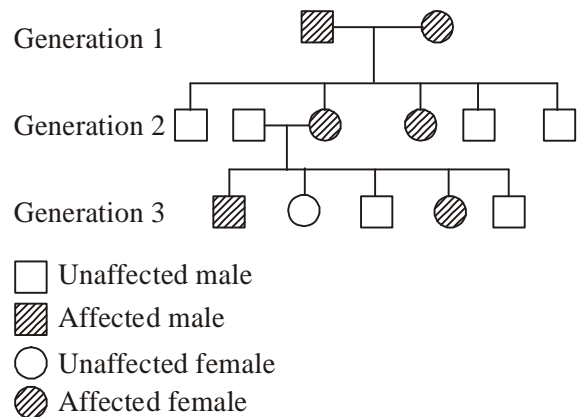
64. The beginning of understanding genetic transformation in bacteria was made by
- (1) Frederick Griffith
  - (2) Hershey and Chase
  - (3) Watson and Crick
  - (4) T.H. Morgan
65. The source of Taq polymerase used in PCR is a
- (1) Thermophilic fungus
  - (2) Mesophilic fungus
  - (3) Thermophilic bacterium
  - (4) Haplophilic bacterium
66. A mixture containing DNA fragments,  $a$ ,  $b$ ,  $c$  and  $d$ , with molecular weights of  $a + b = c$ ,  $a > b$  and  $d > c$ , was subjected to agarose gel electrophoresis. The positions of these fragments from cathode to anode sides of the gel would be
- (1)  $b, a, c, d$
  - (2)  $a, b, c, d$
  - (3)  $c, b, a, d$
  - (4)  $b, a, d, c$
67. Which of the following DNA sequences qualifies to be designated as a palindrome ?
- (1)  $5' - \text{GACCAG} - 3'$  in one strand
  - (2)  $3' - \text{GACCAG} - 5'$  in one strand
  - (3)  $5' - \text{GACGAG} - 3'$
  - (4)  $5' - \text{AGCGCT} - 3'$   
 $3' - \text{CTGGTC} - 5'$   
 $3' - \text{TCGCGA} - 5'$
68. A pea plant parent having violet coloured flowers with unknown genotype was crossed with a plant having white coloured flowers, in the progeny 50% of the flowers were violet and 50% were white. The genotypic constitution of the parent having violet coloured flowers was
- (1) Homozygous
  - (2) Merozygous
  - (3) Heterozygous
  - (4) Hemizygous
69. If the total amount of adenine and thymine in a double-stranded DNA is 45%, the amount of guanine in this DNA will be
- (1) 22.5%
  - (2) 27.5%
  - (3) 45%
  - (4) 55%
70. The number of linkage group(s) present in *Escherichia coli* is
- (1) One
  - (2) Two
  - (3) Four
  - (4) Seven
71. What will be the correct gene expression pathway?
- (1) Gene–mRNA–transcription–translation–protein
  - (2) Transcription–Gene–translation–mRNA–protein
  - (3) Gene–transcription–mRNA–translation–protein
  - (4) Gene–translation–mRNA–transcription–protein
72. The major cause of evolution of genes and protein is
- (1) Point mutation
  - (2) Chromosomal aberration
  - (3) Sexual reproduction
  - (4) Gene duplication and divergence
73. Mendel's principle of segregation means that the germ 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
74. In blood group typing in human, if an allele contributed by one parent is  $I^A$  and an allele contributed by the other parent is  $i$ , the resulting blood group of the offspring will be
- (1) A
  - (2) B
  - (3) AB
  - (4) O
75. 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
76. If the total amount of adenine and thymine in a double-stranded DNA is 60%, the amount of guanine in this DNA will be
- (1) 15%
  - (2) 20%
  - (3) 30%
  - (4) 40%
77. The protein products of the following Bt toxin genes *cryIAc* and *cryIIAb* are responsible for controlling
- (1) Bollworm
  - (2) Roundworm

- (3) Moth                      (4) Fruit fly
78. Walter Sutton is famous for his contribution to
- (1) Genetic engineering
  - (2) Totipotency
  - (3) Quantitative genetics
  - (4) Chromosomal theory of inheritance
79. The reaction, Amino acid + ATP → Aminoacyl-AMP + P – P depicts
- (1) Amino acid assimilation
  - (2) Amino acid transformation
  - (3) Amino acid activation
  - (4) Amino acid translocation
80. The transcription of any gene is the indication of its
- (1) Induction                      (2) Activity
  - (3) Stimulation                  (4) Hypersensitivity
81. A polygenic trait is controlled by 3 genes A, B and C. In a cross  $AaBbCc \times AaBbCc$ , 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
82. The chromosome constitution  $2n - 2$  of an organism represents
- (1) Monosomic                  (2) Nullisomic
  - (3) Haploid                      (4) Trisomic
83. Mendel's principle of segregation means that the germ cells always receive                      three codons from the following, from which any one of the three could bring about this halt ]
- (1) UUU, UCC, UAU          (2) UUC, UUA, UAC
  - (3) UAG, UGA, UAA        (4) UUG, UCA, UCG
3. In the following table identify the correct matching of the crop, its disease and the corresponding pathogen :
- | Crop           | Disease     | Pathogen                        |
|----------------|-------------|---------------------------------|
| (1) Citrus     | Canker      | <i>Pseudomonas rubrilineans</i> |
| (2) Potato     | Late blight | <i>Fusarium udum</i>            |
| (3) Brinjal    | Root-knot   | <i>Meloidogyne incognita</i>    |
| (4) Pigeon Pea | Seed gall   | <i>Phytophthora infestans</i>   |
4. In which one of the following combinations (1-4) of

the number of the chromosomes is the present day hexaploid wheat correctly represented ?

Combination	Monosomic	Haploid	Nullisomic	Trisomic
(1)	21	28	42	43
(2)	7	28	40	42
(3)	21	7	42	43
(4)	41	21	40	43

5. Somaclonal variation is seen in :
- (1) Tissue culture grown plants
  - (2) Apomicts
  - (3) Polyploids
  - (4) Vegetatively propagated plants
6. Given below is a pedigree chart showing the inheritance of a certain sex linked trait in humans



The trait traced in the above pedigree chart is

- (1) Dominant X-linked          (2) Recessive X-linked
  - (3) Dominant Y-linked        (4) Recessive Y-linked
7. The "cri-du-chat" syndrome is caused by change in chromosome structure involving :
- (1) Deletion                      (2) Duplication
  - (3) Inversion                    (4) Translocation
8. Grain colour in wheat is determined by three pairs of polygenes. Following the cross  $AABBCC$  (dark colour)  $\times$   $aabbcc$  (light colour), in  $F_2$  generation what proportion of the progeny is likely to resemble either parent ?
- (1) None                            (2) Less than 5 percent
  - (3) One third                      (4) Half
9. Primary source of allelic variation is
- (1) Independent assortment
  - (2) Recombination
  - (3) Mutation

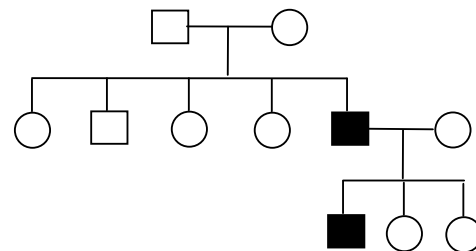


- (4) Polyploidy
10. Which one of the following is a correct statement ?
- (1) "Bt" in "Bt-cotton" indicates that it is a genetically modified organism produced through biotechnology
  - (2) Somatic hybridization involves fusion of two complete plant cells carrying desired genes
  - (3) The anticoagulant hirudin is being produced from transgenic *Brassica napus* seeds
  - (4) "Flavr Savr" variety of tomato has enhanced the production of ethylene which improves its taste
11. Genetic diversity in agricultural crops is threatened by
- (1) Introduction of high yielding varieties
  - (2) Intensive use of fertilizers
  - (3) Extensive intercropping
  - (4) Intensive use of biopesticides
12. A tumour inducing plasmid widely used in the production of transgenic plants is that of
- (1) *Escherichia coli*
  - (2) *Bacillus thuringiensis*
  - (3) *Staphylococcus aureus*
  - (4) *Agrobacterium tumefaciens*
13. Somaclonal variation appears in
- (1) Organisms produced through somatic hybridization
  - (2) Plants growing in highly polluted conditions
  - (3) Apomictic plants
  - (4) Tissue culture raised plants

## Biology Olympiad

1. Very good heterosis in maize crop can be obtained by crossing
- (1) Cross pollinating varieties
  - (2) Inbred lines
  - (3) Varieties which have shown self-sterility
  - (4) Varieties which give a very high yield as a result of outbreeding
2. XXYY condition denotes [
- (1) Supermale
  - (2) Superfemale
  - (3) Klinefelter syndrome

- (4) Turner syndrome
3. Which one of the following is incorrect about prokaryotes ?
- (1) DNA is double stranded
  - (2) DNA is supercoiled
  - (3) DNA is complexed with histones
  - (4) DNA is in the form of a ring
4. During bacterial protein synthesis, the antibiotic tetracycline
- (1) Inhibits interaction between tRNA and mRNA
  - (2) Inhibits translocation of mRNA along ribosome
  - (3) Inhibits binding of amino-acyl t-RNA to ribosome
  - (4) Inhibits peptidyl transferase and peptide bond formation
5. Sewall Wright effect
- (1) Is random change in the allele
  - (2) Leads to founder effect
  - (3) Both (1) and (2) are correct
  - (4) None of the above
6. Which is incorrect about DNA fingerprinting
- (1) Is used to identify criminals in forensic laboratories
  - (2) Is used to determine paternity
  - (3) Is carried out using southern blotting technique
  - (4) None of the above
7. In the following human pedigree chart, the mutant trait under consideration is shaded black. The squares indicate males and the circles females



From the above one can say that the gene responsible for the trait is

- (1) Dominant and sex-linked
  - (2) Dominant but non sex-linked
  - (3) Recessive and sex-linked
  - (4) Recessive but not sex-linked
8. Which of the following is wrong ?

In epistasis –

- (1) One gene modifies the expression of another gene
  - (2) The epistatic effect is brought about by the dominant gene only
  - (3) There is interaction between non-allelic genes
  - (4) Recessive as well as dominant genes can bring about epistatic effect
9. Which of the following is not an example of polygenic inheritance ?
- (1) Skin colour in humans
  - (2) Human height
  - (3) Coat colour in mouse
  - (4) Feather colour in fowls
10. Cri-du-chat syndrome is caused due to loss of
- (1) Short arm of chromosome 7
  - (2) Half of short arm of chromosome 5
  - (3) Half of arm of chromosome  $\phi$
  - (4) Half of short arm of chromosome 6



**ANSWERS :**  
**QUESTIONS FROM COMPETITIVE EXAMS**

**CBSE - PMT**

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

**CBSE - PMT MAINS**

1.	(1)	2.	(2)	3.	(3)	4.	(3)	5.	(3)
6.	(4)	7.	(2)	8.	(3)	9.	(2)	10.	(4)
11.	(3)	12.	(2)	13.	(2)	14.	(1)	15.	(2)
16.	(1)	17.	(2)						

## NEET

1.	(1)	2.	(4)	3.	(2)	4.	(1)	5.	(2)
6.	(1)	7.	(1)	8.	(2)	9.	(2)	10.	(3)
11.	(3)	12.	(4)	13.	(1)	14.	(3)		

## NEET

1.	(1)	2.	(4)	3.	(3)	4.	(3)	5.	(2)
6.	(3)	7.	(2)	8.	(3)	9.	(4)	10.	(3)
11.	(1)	12.	(3)	13.	(3)	14.	(1)		

## DPMT

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

## AIIMS

1.	(3)	2.	(3)	3.	(3)	4.	(4)	5.	(1)
6.	(1)	7.	(1)	8.	(2)	9.	(3)	10.	(3)
11.	(1)	12.	(4)	13.	(4)				

## BIOLOGY OLYMPIAD

1.	(2)	2.	(3)	3.	(3)	4.	(3)	5.	(3)
6.	(4)	7.	(3)	8.	(2)	9.	(3)	10.	(2)