DPP - Daily Practice Problems

Chapter-wise Sheets

Date : | Start Time : | End Time :

BIOLOGY CB27

SYLLABUS : Principles of inheritance and variation

Max. Marks : 180 **Marking Scheme :** + 4 for correct & (–1) for incorrect **Time : 60 min.**

INSTRUCTIONS : This Daily Practice Problem Sheet contains 45 MCQs. For each question only one option is correct. Darken the correct circle/ bubble in the Response Grid provided on each page.

1. Cross between AaBB and aaBB will form
(a) 1 AaBB : 1aaBB (b) All AaBB
(c) 3 AaBB : 1 aaBB (d) 1 AaBB : 3 aaBB

2. Red (RR) *Antirrhinum* is crossed with white (WW) one. Offspring RW are pink. This is an example of
(a) dominant -recessive
(b) incomplete dominance
(c) hybrid
(d) supplementary genes

3. The dihybrid ratio in F_2 - generation is
(a) 1 : 1 : 1 : 1 (b) 2 : 1 : 2 : 1
(c) 3 :1 (d) 9 : 3 : 3 : 1

4. Genetic map is one that
(a) shows the distribution of various species in a region
(b) establishes sites of the genes on a chromosome
(c) establishes the various stages in gene evolution
(d) show the stages during the cell division

5. A gene pair hides the effect of another gene. The phenomenon is
(a) epistasis (b) dominance
(c) mutation (d) None of the above

6. Independent assortment of genes does not take place when
(a) genes are located on homologous chromosomes
(b) genes are linked and located on same chromosomes
(c) genes are located on non-homologous chromosomes
(d) All the above

7. Extranuclear inheritance occurs in
(a) peroxisome and ribosome
(b) chloroplast and mitochondria
(c) mitochondria and ribosome
(d) chloroplast and lysosome

8. Test cross involves
(a) crossing between two F_1 hybrids
(b) crossing the F_1 hybrid with a double recessive genotype
(c) crossing between two genotypes with dominant trait
(d) crossing between two genotypes with recessive trait

9. When one gene controls two or more different characters simultaneously, the phenomenon is called
(a) apomixis (b) pleiotropy
(c) polyploidy (d) polyteny

RESPONSE GRID					
1. ⓐⓑⓒⓓ	2. ⓐⓑⓒⓓ	3. ⓐⓑⓒⓓ	4. ⓐⓑⓒⓓ	5. ⓐⓑⓒⓓ
6. ⓐⓑⓒⓓ	7. ⓐⓑⓒⓓ	8. ⓐⓑⓒⓓ	9. ⓐⓑⓒⓓ	

Space for Rough Work

10. ABO blood group system is due to
(a) multifactor inheritance
(b) incomplete dominance
(c) multiple allelism
(d) epistasis

11. In humans, male XXY and female XXXX occur due to
(a) aneuploidy
(b) euploidy
(c) Nutosomal syndrome
(d) none of these

12. Haemophilia is more common in males because it is a
(a) Recessive character carried by Y-chromosome
(b) Dominant character carried by Y-chromosome
(c) Dominant trait carried by X-chromosome
(d) Recessive trait carried by X-chromosome

13. The most striking example of point mutation is found in a disease called
(a) thalassemia (b) night blindness
(c) down's syndrome (d) sickle cell anaemia

14. In Down's syndrome of a male child, the sex complement is
(a) XO (b) 45 + XY
(c) 45 + XX (d) XXY

15. Barr body in mammals represents
(a) all the heterochromatin in female cells
(b) Y-chromosomes in somatic cells of male
(c) all heterochromatin in male and female cells
(d) one of the two X-chromosomes in somatic cells of females

16. A person with the sex chromosomes XXY suffers from
(a) Down's syndrome
(b) Klinefelter's syndrome
(c) Turner's syndrome
(d) Gynandromorphism

17. *Drosophila* flies with XXY genotype are females, but human beings with such genotype are abnormal males. It shows that
(a) Y-chromosome is essential for sex determination in *Drosophila.*
(b) Y-chromosome is female determinant in *Drosophila.*
(c) Y-chromosome is male determination in human beings.
(d) Y-chromosome has no role in sex determination either in *Drosophila* or in human beings.

18. Lack of independent assortment of two genes A and B in fruit fly *Drosophila* is due to
(a) repulsion (b) recombination
(c) linkage (d) crossing over

19. Select the **incorrect** statement from the following:
(a) Galactosemia is an inborn error of metabolism
(b) Small population size results in random genetic drift in a population
(c) Baldness is a sex -limited trait
(d) Linkage is an exception to the principle of independent assortment in heredity

20. The "Cri-du-Chat" syndrome is caused by change in chromosome structure involving
(a) deletion (b) duplication
(c) inversion (d) translocation

21. Biometric genetics deals with :
(a) the biochemical explanations of various genetical phenomena
(b) the effect of environment on genetic set up organisms
(c) the genetical radiations on the living organisms
(d) the inheritance of quantitative traits

22. Which one of the following conditions correctly describes the manner of determining the sex in the given example?
(a) Homozygous sex chromosomes (ZZ) determines female sex in birds.
(b) XO type of sex chromosomes determines male sex in grasshopper.
(c) XO condition in human as found in Turner syndrome, determines female sex.
(d) Homozygous sex chromosomes (XX) produces male in *Drosophila.*

23. Select the correct statement from the ones given below with respect to dihybrid cross.
(a) Tightly linked genes on the same chromosome show higher recombinations
(b) Genes far apart on the same chromosome show very few recombinations
(c) Genes loosely linked on the same chromosome show similar recombinations as the tightly linked ones
(d) Tightly linked genes on the same chromosome show very few recombinations

24. Chromosome complement with 2n – 1 is called
(a) Monosomy (b) Trisomy
(c) Nullisomy (d) Tetrasomy

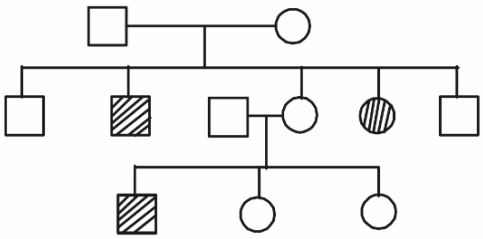
RESPONSE GRID					
	10. ⓐⓑⓒⓓ	**11.** ⓐⓑⓒⓓ	**12.** ⓐⓑⓒⓓ	**13.** ⓐⓑⓒⓓ	**14.** ⓐⓑⓒⓓ
	15. ⓐⓑⓒⓓ	**16.** ⓐⓑⓒⓓ	**17.** ⓐⓑⓒⓓ	**18.** ⓐⓑⓒⓓ	**19.** ⓐⓑⓒⓓ
	20. ⓐⓑⓒⓓ	**21.** ⓐⓑⓒⓓ	**22.** ⓐⓑⓒⓓ	**23.** ⓐⓑⓒⓓ	**24.** ⓐⓑⓒⓓ

Space for Rough Work

25. In a cross between AABB × aabb, the ratio of F_2 genotypes between AABB, AaBB, Aabb and aabb would be
(a) 9 : 3 : 3 : 1 (b) 2 : 1 : 1 : 2
(c) 1 : 2 : 2 : 1 (d) 7 : 5 : 3 : 1

26. The basis of karyotaxonomy is
(a) Number of nucleoli
(b) Sedimentation rate of ribosomes
(c) Chromosome banding
(d) Chromosome number

27. Study the pedigree chart given below:

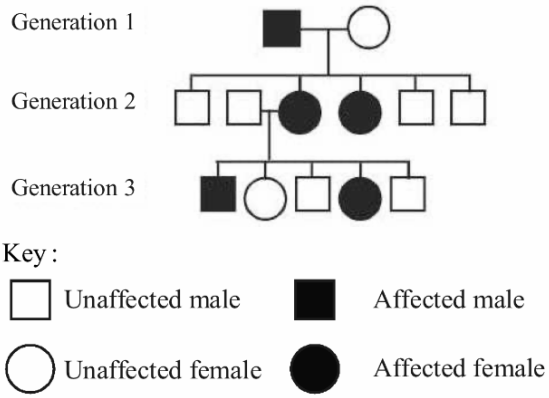


What does it show?
(a) Inheritance of a recessive sex-linked disease like haemophilia
(b) Inheritance of a sex-linked inborn error of metabolism like phenylketonuria
(c) Inheritance of a condition like phenylketonuria as an autosomal recessive trait
(d) The pedigree chart is wrong as this is not possible

28. Which one is a hereditary disease ?
(a) Cataract (b) Leprosy
(c) Blindness (d) Phenylketonuria

29. Diploid chromosome number in humans is
(a) 46 (b) 44
(c) 48 (d) 42

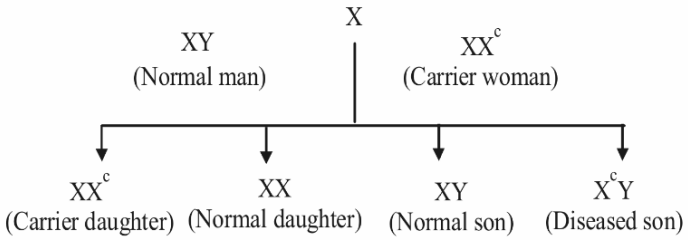
30. Given below is a pedigree chart showing the inheritance of a certain sex-linked trait in humans



The trait traced in the above pedigree chart is
(a) dominant X - linked
(b) recessive X-linked
(c) dominant Y - linked
(d) recessive Y-linked

31. In maize, coloured endosperm (C) is dominant over colourless (c); and full endosperm (R) is dominant over shrunken (r). When a dihybrid of F_1 generation was test crossed, it produced your phenotypes in the following percentage:
Coloured full - 48% Coloured shrunken - 5%
Colourless full - 7% Colourless shrunken - 40%
From this data, what will be the distance between two non-allelic genes?
(a) 48 units (b) 5 units
(c) 7 units (d) 12 units

32. Inheritance of which of the following traits is shown in the given cross?



(a) X-linked dominant trait
(b) X-linked recessive trait
(c) Autosomal dominant trait
(d) Autosomal recessive trait

33. More than two alternate forms of a gene present on the same locus are called (i). They are produced due to repeated (ii) of the same gene but in different directions. Their well known example is (iii).

	(i)	(ii)	(iii)
(a)	Epistatic genes	Crossing over	polydactyly
(b)	Multiple alleles	mutations	human blood groups
(c)	Supplementary	mutations	hypertrichosis
(d)	Linked genes	Crossing over	aljaptonuria

RESPONSE GRID					
	25. (a)(b)(c)(d)	**26.** (a)(b)(c)(d)	**27.** (a)(b)(c)(d)	**28.** (a)(b)(c)(d)	**29.** (a)(b)(c)(d)
	30. (a)(b)(c)(d)	**31.** (a)(b)(c)(d)	**32.** (a)(b)(c)(d)	**33.** (a)(b)(c)(d)	

Space for Rough Work

34. In fruit files, long wing is dominant to vestigial wing. When heterozygous long-winged files were crossed with vestigial-winged files, 192 offsprings were produced. Of these, 101 had long wings and 91 had vestigial wings.
If an exact Mendelian ratio had been obtained, then the number of each phenotype would have been

	Long-winged	Vestigial-winged
(a)	64	128
(b)	96	96
(c)	128	64
(d)	192	0

35. Phenotypic and genotypic ratio is similar in case of
(a) complete dominance
(b) incomplete dominance
(c) over dominance
(d) epistasis

36. To determine the genotype of a tall plant of F_2 generation, Mendel crossed this plant with a dwarf plant. This coss represents a
(a) test cross (b) back cross
(c) reciprocal cross (d) dihybrid cross

37. Match Column-I with Column-II and select the correct option from the codes given below.

	Column-I	Column-II
A.	A single trait controlled by three or more than three alleles	(i) Pleiotropy
B.	A single trait controlled by three or more than three genes	(ii) Multiple alleles
C.	A single gene exhibits multiple phenotypic expression	(iii) Polygenic inheritance

38. Chromosomal theory of inheritanc was given by
(a) Morgan et al (b) Sutton and Boveri
(c) Hugo de Vries (d) Gregor J. Mendel

39. What is true about the crossing over between linked genes?
(a) No crossing over at all
(b) High percentage of crossing over
(c) Hardly any crossing over
(d) None of these

40. Which of the following is incorrect regarding ZW-ZZ type of sex determination?
(a) It occurs in birds and some reptiles
(b) Females are homogametic and males are heterogametic
(c) 1 : 1 sex ratio is produced in the offsprings
(d) All of these

41. Red green colourblindness is a sex linked trait. Which of the given statements is not correct regarding colourblindness?
(a) It is more common in males than in females
(b) Homozygous recessive condition is required for the expression of colourblindness in females
(c) Males can be carriers of the trait
(d) Colourblind women always have colourblind father and always produce colourblind son.

42. At a particular locus, frequency of allele A is 0.6 and that of allele a is 0.4. What would be the frequency of heterozygotes in a random mating population at equilibrium?
(a) 0.36 (b) 0.16
(c) 0.24 (d) 0.48

43. The distance between the genes is measured by
(a) Angstrom (b) map unit
(c) Dobson unit (d) millimetre

44. Which of the following trait is controlled by dominant autosomal genes?
(a) Polydactyly
(b) Huntigton's chorea
(c) PTC (phenylthiocarbomide) tasting
(d) All of these

45. The mutations that involve addition, deletion or substitution of a single base pair in a gene are referred to as
(a) point mutations (b) lethal mutations
(c) silent mutations (d) retrogressive mutations

RESPONSE GRID					
	34. (a)(b)(c)(d)	**35.** (a)(b)(c)(d)	**36.** (a)(b)(c)(d)	**37.** (a)(b)(c)(d)	**38.** (a)(b)(c)(d)
	39. (a)(b)(c)(d)	**40.** (a)(b)(c)(d)	**41.** (a)(b)(c)(d)	**42.** (a)(b)(c)(d)	**43.** (a)(b)(c)(d)
	44. (a)(b)(c)(d)	**45.** (a)(b)(c)(d)			

Space for Rough Work

DAILY PRACTICE PROBLEM DPP CHAPTERWISE 27 - BIOLOGY			
Total Questions	45	Total Marks	180
Attempted		Correct	
Incorrect		Net Score	
Cut-off Score	45	Qualifying Score	60
Success Gap = Net Score – Qualifying Score			
Net Score = (Correct × 4) – (Incorrect × 1)			