DPP
DAILY PRACTICE PROBLEMS

Class : XIIth
Date :

Solutions

Subject : BIOLOGY
DPP No. : 9

Topic :- Principles of Inheritance & Variations

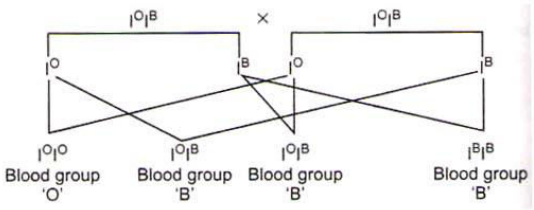
1 **(b)**
Deletion is a chromosomal aberration in which there is loss of a chromosomal segment.

2 **(a)**
There are three symbols for the carrier (heterozygous condition). ⊙ ⊗ and ◑ Generally, the carriers are females so there is rounded structure

3 **(d)**
Turner's syndrome is a disorder caused due to the absence of one of the X-chromosome, *i.e.*, 45 with XO (44 autosomes + XO). Such females are sterile as ovaries are rudimentary besides other features including lack of other secondary sexual characters.

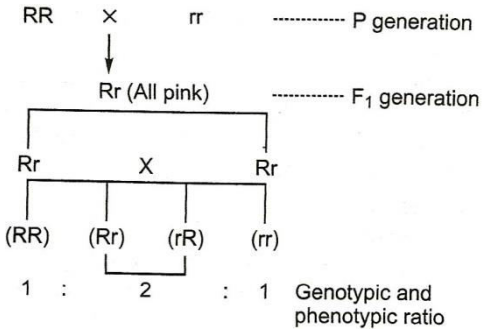
4 **(c)**
Genotype of a person with blood group-B may be I^BI^B or I^OI^B, person with genotype I^BI^B can not produce offsprings with blood group-O in any case but if the person's genotype is I^OI^B, then its offsprings may have blood group-O.

eg,



5 **(b)**
Incomplete dominance or **blending inheritance** was first seen in *Mirabilis jalapa*(4'O clock

plant). Here, when red flowers are crossed with white flowers variety the F_1-hybrid is pink and F_2 ratio is 1 red : 2 pink : 1 white.



6 **(d)**
In **incomplete** (partial or intermediate) **dominance**, the effect of dominant allele is diluted or modified, so that the phenotypic expression of the concerned trait in a hybrid is distinguishable from both parental type. Consequently, both phenotypic and genotypic ratios in F_2-generation are 1 : 2 : 1.

7 **(b)**
Cytoplasmic inheritance always shows maternal characters.

8 **(b)**
Type of gamete participating in selfing of members in monohybrid cross is of two types.

9 **(b)**
GAG code for glutamic acid in haemoglobin *m*RNA replaced by GUG code which code for valine in haemophillic haemoglobin *m*RNA

10 **(a)**
Linkage is the inheritance of certain genes as a group because they are parts of the same chromosome. Linked genes do not show independent assortmant. Linkage was first suspected and theorized in 1903 by **Sutton** and **Boveri.**

11 **(c)**
If a character is transmitted from father to his sons and then to grandson only, it means it is

located on Y-chromosome (inheritance of Y-linked genes).

12 **(b)**

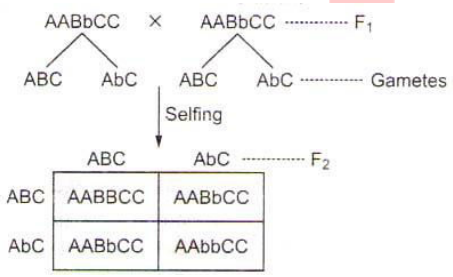
The term 'mutation' was coined by Hugo de Vries (1901). He also proposed mutation theory of evolution. The mutational theory of evolution published in 1903. Hugo de Vries worked on *Oenothera lamarckiana* (evening primorse). Out of a population of 54343 plants, de Vries observed 834 mutation and concluded that the primary force of evolution is mutation

13 **(b)**

'Jumping genes' or **movable genetic elements** were discovered by **'Barbara McClintock'** (1902-92) in maize. These 'controlling elements' could move from one location to another on the chromosome.

14 **(a)**

Since AABbCC contains only one heterozygous allelic pair, 'Bb', the cross would behave as monohybrid cross leading to phenotypic ratio in F_2-generation.



Phenotypic ratio is 3 : 1

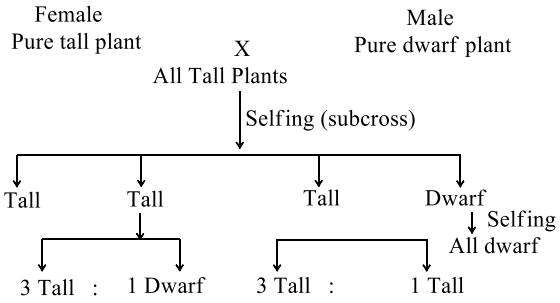
15 **(b)**

Dominant character.

Law or Principle of Dominance

In heterozygous individuals or hybrids a character is represented by two contrasting factors called alleles or allelomorphs. Out of the two contrasting alleles. Only one is able to express its effect in the individual. It is called dominant factor or dominant allele.

The other which does not show its effect in the heterozygous individual is called recessive factor or recessive allele. The cross between the pure tall and pure dwarf gives all progeny (F_1) tall.



The character shown by F_1 called dominant character

16 **(d)**

Sutton and **Boveri** proposed chromosomal theory of inheritance. This theory believes that chromosomes are vehicles of hereditary information possess mendelian factors segregate and assort independently during transmission from one generation to the next.

17 **(b)**

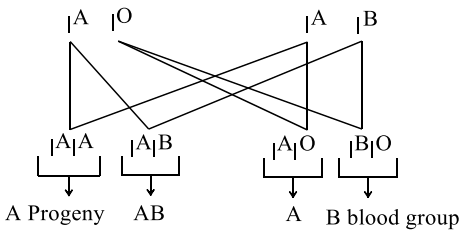
In sex-linkage, the speciality is criss-cross inheritance. Criss cross inheritance is a type of sex linked inheritance where a parent passes the traits to the grand child of the same sex through offspring of the opposite sex, that is father passes the traits to grandson through his daughter while the mother transfers traits to her grand daughter through her son, criss cross inheritance establish the relationship between gene and the sex chromosomes.

18 **(b)**

For the blood group A, there will be two type of genotype$-I^AI^A, I^AI^D$.

For the blood group AB there will be only one genotype$-I^AI^B$.

Case I When parent blood group I^AI^O and I^AI^B



Case II When parent blood group are I^AI^A and I^AI^D

19 **(b)**

Nullisomic=$2n-2$

Monosomic= $2n-1$

Trisomic= $2n+1$

Haploid= n

20 **(b)**

Phenylketonuria (Folling; 1934). It is an inborn, autosomal, recessive metabolic disorder in which the homozygous recessive individual lacks the enzyme **phenylalanine hydroxylase** needed to change phenylalanine (amino acid) to tyrosine (amino acid) in liver. It results in hyperphenylalanine

ANSWER-KEY										
Q.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
A.	**B**	**A**	**D**	**C**	**B**	**D**	**B**	**B**	**B**	**A**
Q.	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
A.	**C**	**B**	**B**	**A**	**B**	**D**	**B**	**B**	**B**	**B**