

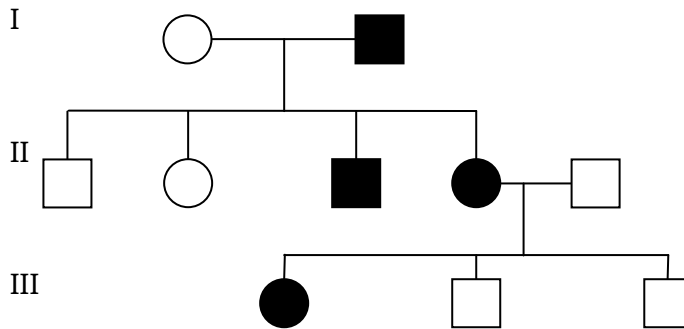
**CLASS XII**  
**PRINCIPLES OF INHERITANCE AND VARIATION**

1	Name one autosomal dominant and one autosomal recessive Mendelian disorder in humans.	1
2	Write the genotype of i) an individual who is carrier of sickle cell anaemia gene but apparently unaffected, and ii) an individual affected with the disease.	1
3	A human being suffering from Down's syndrome shows trisomy of 21 <sup>st</sup> chromosome. Mention the cause of this chromosomal abnormality.	1
4	Write the percentage of F <sub>2</sub> homozygous and heterozygous populations in a typical monohybrid cross.	1
5	A man with blood group A married a woman with B group. They have a son with AB blood group and a daughter with blood group O. Work out the cross and show the possibility of such inheritance.	2
6	The male fruit fly and female fowl are heterogametic while the female fruit fly and male fowl are homogametic. Why are they called so?	2
7	A plant of <i>Antirrhinum majus</i> with red flowers was crossed with another plant of the same species with white flowers. The plants of the F <sub>1</sub> generation bore pink flowers. Explain the pattern of inheritance with the help of a cross.	2
8	A woman with blood group 'O' married a man with AB group. Show the possible blood groups of the progeny. List the alleles involved in this inheritance.	2
9	How does a test cross help in identifying the genotype of the organism? Explain.	2
10	When a tall pea plant was selfed, it produced one fourth of its progeny as dwarf. Explain with the help of a cross.	2
11	i) Why are grasshopper and <i>Drosophila</i> said to show male heterogamety? Explain. ii) Explain female heterogamety with the help of an example.	2
12	Explain the pattern of inheritance of haemophilia in humans. Why is the possibility of a human female becoming haemophilic extremely rare? Explain.	3
13	A non-haemophilic couple was informed by their doctor that there is possibility of a haemophilic child be born to them. Explain the basis on which the doctor conveyed this information. Give the genotypes and the phenotypes of all the possible children who could be born to them	3

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Study the pedigree chart and answer the questions that follow:

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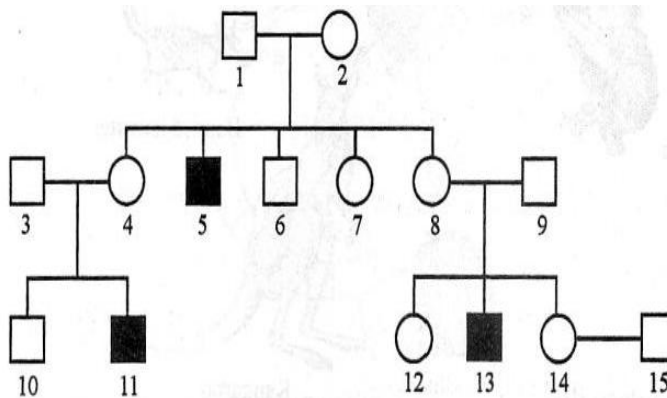


- Is the trait recessive or dominant?
- Is the trait sex-linked or autosomal?
- Give the genotypes of the parents shown in generation I and their third child shown in generation II and the first grand child shown in generation III.

15

Haemophilia is a sex linked recessive disorder of humans. The pedigree chart given below shows the inheritance of haemophilia in one family. Study the pattern of inheritance and answer the questions given.

3



- Give all the possible genotypes of the members 4, 5 and 6 in the pedigree chart.
- A blood test shows that the individual 14 is a carrier of haemophilia. The member numbered 15 has recently married the member numbered 14. What is the probability that their first child will be haemophilic male?

16	Inheritance pattern of ABO blood groups in humans shows dominance, codominance and multiple allelism. Explain each concept with the help of blood group genotypes.	3
17	Who proposed chromosomal theory of inheritance? Point out any two similarities in the behaviour of chromosomes and genes.	3
18	Explain the sex determination mechanism in humans. How is it different in birds.	3
19	Explain the mechanism of sex determination in insects like Drosophila and grasshopper.	3