UNIT-VII – GENETICS AND EVOLUTION
CHAPTER – 5 : PRINCIPLES OF INHERITANCE AND VARIATION
(KEY POINTS)

S.No	TERM	Explanation
1.	Heredity:	It can be defined as the transmission of characters from one generation to successive generations of living organisms.
2.	Alleles:	The various forms of a gene are called alleles.
3.	Phenotype:	The external / observable characteristics of an organism constitute its phenotype.
4.	Genotype:	The genetic constitution of an organism is its genotype.
5.	Homozygote:	It is an individual organism in which the members of a pair of alleles for a Character
6.	Heterozygote:	It is an individual organism in which the members of a pair of alleles of a character are different.
7.	Dominant	The form of the character which is expressed in the F1 hybrid is called dominant character: character.
8.	Recessive	The form of the character which is suppressed in the presence of the dominant character: character in a hybrid is called recessive character.
9.	Monohybrid cross:	It is a cross between individuals of the same species, in which the inheritance of contrasting pairs of a single trait is considered.
10.	Dihybrid cross:	It is a cross between two individuals of the same species, in which the inheritance of contrasting pairs of two traits is considered.
11.	Glu –	glutamic acid
12.	Val-	valine

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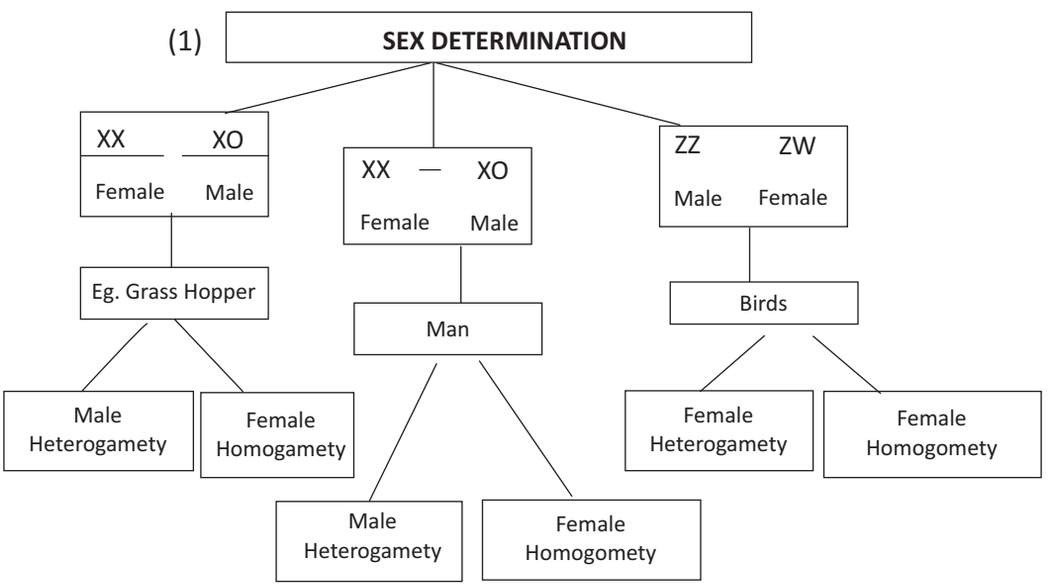
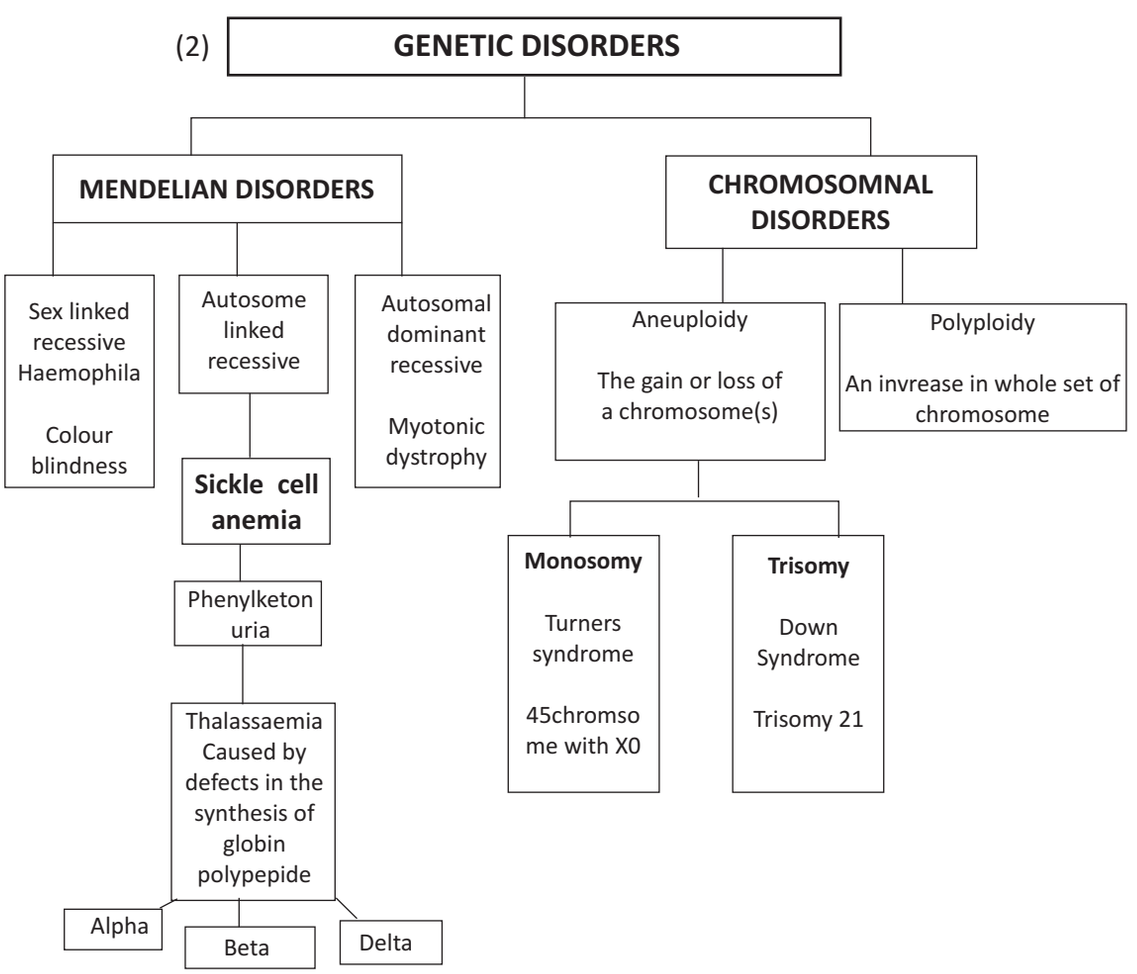
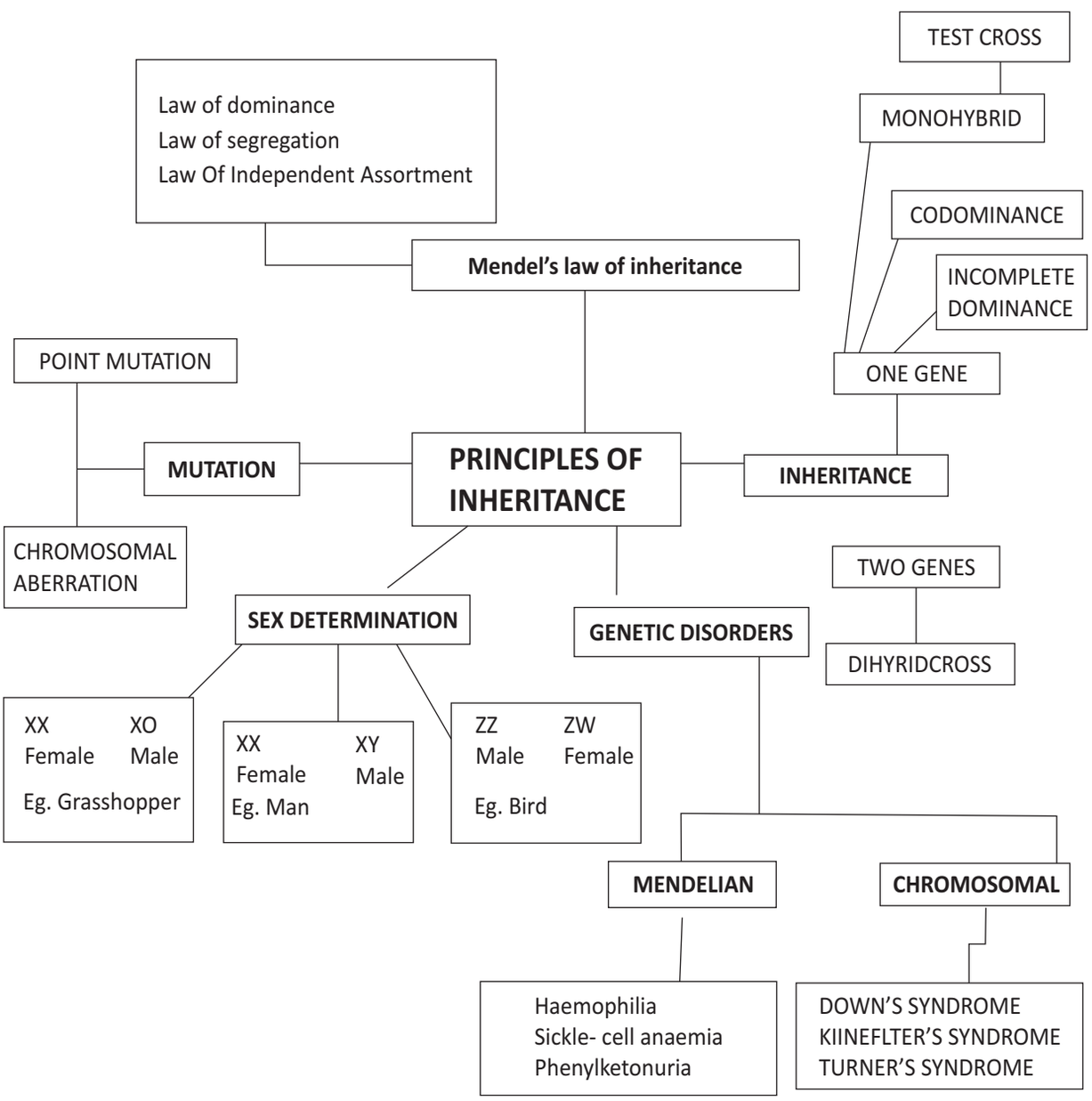
(FLOW CHART)





CHAPTER – 5 : PRINCIPLES OF INHERITANCE AND VARIATION
(CONCEPT MAP)



CHAPTER – 5 : PRINCIPLES OF INHERITANCE AND VARIATION
(QUESTION BANK)

1. State the difference between a gene and an allele.
2. Write the possible genotypes Mendel got when he crossed F1 Tall pea plants with a dwarf pea plant.
3. Who had proposed the chromosomal theory of inheritance?
4. Write the scientific name of the organism which T.H. Morgan used in his genetic experiments.
5. List the advantages of selecting pea plant for his experiments by Mendel
6. Briefly mention the contributions of T.H.Morgan in genetics
7. What is a point mutation, give an example
8. What is pedigree analysis, how is it useful?
9. The male fruit fly and female fowl are heterogametic, while the female fruit fly and the Male fowl are homogametic why are they termed so.
10. Define and explain test cross
11. Explain law of dominance with an example.
12. With the help of an example differentiate between incomplete dominance and co- dominance.
13. Explain the mechanism of sex determination in honeybees
14. How does the Mandelian disorder phenylketonuria occur?
15. Why did Mendel select garden pea plant for his experiments?
16. Tabulate the different types of sex determination in organisms.
17. Give the characteristic features of Turner's Syndrome.
18. What will be the genotype and phenotype of the offspring if a colour blind man marries a carrier woman?
19. Anita was happy when she gave birth to her first child. Her in- laws were dissatisfied at her not giving birthto a male child and blamed Anita. Anita tried to convince her in laws that she had no role in the child's gender. They understood the biological reason but were yet to be satisfied. Anita's husband took up the matter and convinced the parents.

    a) What values did Anita's husband show in the above situation?

    b) What governs sex determination in humans? How is it different from birds?

    c) Why can't Anita be blamed for not giving birth to a male child?

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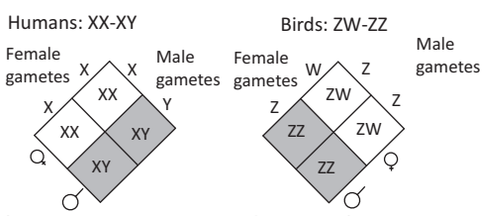
(ANSWER KEY)

Q No.	HINTS	
1	Alleles are different forms of a gene	1
2	Tall and dwarf	1
3	Sutton & Boveri	1
4	Drosophila melanogaster	1
5	Bisexual,one season breeding, contrasing traits 1	
6	Experiments with Drosophila-linkage & recombination	1
7	Change of a single nitrogen base, Eg. Sickle cell amaemia	1
8	Method of analyzing inheritance of traits in humans. Study inheritance of diseases for genetic counsellin	2
9	Produce dissimilar gametes-heterogametic, produce similar gametes-they are homogametic	2
10	Cross between dominant phenotype of unknown genotype with the recessive plant. Ratio 1:1 shows genotype of dominaant plant as hetrozygous.	2
11	When a pair of heterozygous alleles seen together, the allele which is expressed is the dominant one. Tt Tall plants produced	2
12	Neither of the hetrozygous pair expressed completely Eg. Mirabilis sp. Both the alternative forms are expressed when found together Eg. blood groups.	2
13	Haplo-Diploid-unfertillised eggs become males, fertilized eggs become females.	3
14	Inborn error of metabolism-lacks enzyme for converting phenyl alanine to tyrosine. Phenyl pyruvic acid is excreted	3
15	Short life span, only 4 pairs of chromosomes, distinct male & female traits, cultured in the lab	3
16	XX female, XY male, ZZ male, ZW female, XO male, XX female	3
17	Female sterile with rudimentary overies, lack other sexual characters. XO	2+1
18	Man with X^c female with one X^c and explanation through flow chart	3
19	a) Strong and determined personality with responsibility towards the family and respect for elders. b) Sex chromosomes. In human males it is XY and in female it is XX In birds, male is ZZ while female is ZW  c) Human femals are homogametic i.e. produces only one type of gametes containing 22+X choromosome only. Males are hetrogametic and produce two types of gametes 22+X and 22+Y. It is the type of the male gamete which determines the sex of the foetus. If X chromosome containing spaerm fuses with the egg, it produces a female child whereas if Y chromosome containing sperm fuses with the egg, it produces a male child.	4