

4.1 MENDELIAN GENETICS: MONOHYBRID & DIHYBRID

a) Define Terminologies Used in Genetic Inheritance: Allele, gene, locus, genotype, phenotype, homozygous, heterozygous, dominant, recessive, self cross and test cross.



Exercise 4.1 (a): Match the following terms with their correct description

Gene	A segment of DNA that serve as a unit of hereditary information Eg: Flower position
Allele	The genetic constitution for a certain character of an organism. Eg: AA or Aa or aa
Locus	A cross between male and female from the same plant or same generation. Eg: Tt x Tt
Dominant allele	A cross between an individual of unknown genotype with a homozygous recessive individual. Eg : T__ x tt
Recessive allele	Allele that can be expressed in homozygous or heterozygous condition.
Homozygous	Alternative forms of a gene
Heterozygous	The position of a gene on a chromosome
Genotype	Allele that can only be expressed in homozygous condition. Eg : aa
Phenotype	Having 2 identical alleles for a certain gene. Eg : AA or aa
Test cross	Having 2 different alleles for a certain gene. Eg : Aa
Self cross	- Organisms that are homozygous for any given genotype - When they are self-fertilized, they produce offspring that has the same phenotype as the parent; generation after generation Eg: TT @ tt, TTAA @ ttaa @ TTaa @ ttAA
Pure or True breeding	The physical appearance for a certain character of an organism. Eg ; Terminal, Axial

Symbols Used in Genetic Diagram

P

•Parental generation

F₁

•First **filial** generation (offspring produced from a cross between individuals of P generation)

F₂

•Second **filial** generation (offspring produced from a cross between individuals of F₁ generation)

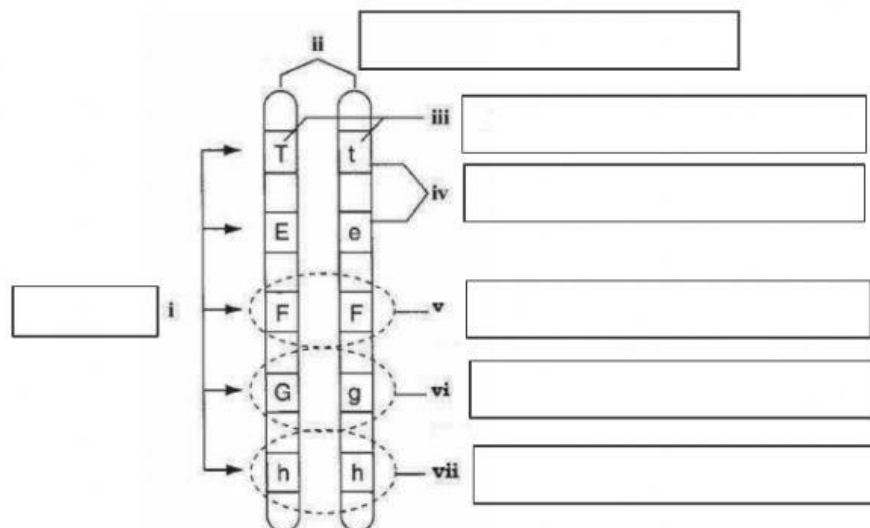
Punnet square

•A diagram used in the study of inheritance to show the predicted genotypic results of random fertilization in genetic crosses between individuals of known genotype

•Example : Aa x Aa

	A	a
A	AA	Aa
a	Aa	aa

Exercise 4.1 (b): Label i-vii using the given clue.



Homologous chromosome		Alleles of the same genes
Homozygous dominant allele		Different genes
Heterozygous allele	Homozygous resessive allele	Loci