

BIOLOGY ASSIGNMENT

CHAPTER- PRINCIPLES OF INHERITANCE AND VARIATION

1. In radish plants, the shape of the radish produced may be long, round or oval. Crosses among plants that produced oval radishes yielded 121 plants that produced long radishes, 243 that produced oval radishes and 119 that produced round radishes.

- a) What type of inheritance appears to be involved? Explain your logic.
- b) What results would you expect from a long with long cross ?
- c) What results would you expect from a round with round cross ?

2. In certain cattle, the hair colour can be red (homozygous RR), white (homozygous R'R') or roan (a mix of red and white hair - heterozygous RR').

- a) When a red bull is mated with a white cow, what genotypes and phenotypes of offsprings could be obtained?
- b) If one of the offsprings is mated to a white cow, what genotype and phenotype of offspring could be produced? In what proportion?

3. Show a cross between a person who has heterozygous A type blood and a person who has homozygous B type blood.

4. A man whose blood group is A and a woman whose blood group is B have a child whose blood group is O.

- a) What are the genotypes of the three individuals ?
- b) What is the probability of the couple's next child having blood group AB ?

5. A smooth seeded and red flowered pea plant (SsRr) is crossed with smooth seeded and white flowered pea plant (Ssrr). Determine the phenotypic and genotypic ratio in F₁ progeny?

6. In Mendel's breeding experiment on garden pea, the offspring of F₂ generation are obtained in the ratio of 25% pure yellow pod, 50% hybrid green pods and 25% green pods.

State : i) Which pod colour is dominant

ii) The phenotypes of the individuals of F₁ generation.

iii) Work out the cross.

7) In a cross made between a hybrid tall and red plant (TtRr) with dwarf and white flower (ttrr). What will be genotype of plants in F₁ generation?

8) A dihybrid heterozygous tall and yellow pea plant was crossed with double recessive plant.

a) What type of cross is this?

b) Workout the genotype and phenotype of progeny?

c) What principle of Mendel is illustrated through the result of this cross?

9) Explain the genetic basis of blood grouping in human population.

10) Explain incomplete dominance shown by starch grains of pea plants.