**SYMBIOSIS SCHOOL, NASHIK**

**STD : X TERM I (2020-21)**

**SUB : BIOLOGY L.NO.9 HEREDITY AND EVOLUTION**

**Exercise questions**

Q.1. How do Mendel’s experiment show that traits may be dominant or recessive?

Ans. i) Mendel crossed homozygous tall plant with homozygous short plant. In F1 generation, all

the plants were tall. In F2 generation one fourth plants were short.

ii) This indicates that both the traits for tallness and shortness are inherited in F1 plants,

but only the trait for tallness was expressed. The trait for shortness remains suppressed.

iii) The trait which is expressed in F1 generation is called dominant trait. The trait which remain

suppressed in F1 generation but is expressed in F2 generation is called recessive trait.

Q.2. How do Mendel’s experiment show that traits are inherited independently?

Ans. i) Mendel crossed homozygous plant having round yellow seeds with homozygous plant

having wrinkled green seeds. In F1 generations all the plants had round yellow seeds.

ii) In F2 generation along with parental combinations (round yellow , wrinkled green) , two

new combinations (wrinkled yellow , round green) were also seen.

iii) This shows that the traits for colour of the seed (yellow/green) and the nature of the seed

coat (round/wrinkled) are inherited independently.

Q.3. How is the sex of the child determined in the human beings?

Ans. i) In human beings, sex determination is a genetic mechanism i.e sex is determined by the

chromosomes. The sex chromosomes in males are XY and in females are XX.

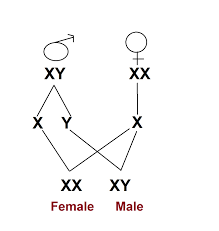
ii) During gamete formation, half the sperms in males have X chromosome and half have Y

chromosome. All the eggs in female has X chromosome.

iii) If the sperm having X chromosome fuse with the egg , it is a girl (XX). If the sperm having Y

chromosome fuse with the egg, it is a boy (XY).

Hence , the sex of the child is determined by the chromosome inherited from the father.



Q.4. Explain how sexual reproduction gives rise to more variations than asexual reproduction.

How does this affect the evolution of those organisms that reproduce sexually?

Ans. i) Sexual reproduction involves two individuals having their own sets of variations. During

gamete formation, these individuals produce the gametes having different combination

of genes. When the gametes fuse, new recombinations are produced which give rise to

new variations.

ii) More variations help the organism to adapt better in the given environment. It also helps

the organism to adapt in a new environment. Both these things increase the chances of

survival.

Thus it helps in evolution of the organisms who reproduce sexually.

Q.5. How is equal genetic contribution of male and female parents ensured in the progeny?

Ans. i) Every sexually reproducing organism has diploid number of chromosomes (2n).

The gametes contain half the number of chromosomes i.e haploid (n).

ii) The male gamete contain half the number of chromosome/DNA from the father and

female gamete contain half the number of chromosome/DNA from mother.

iii) When the gametes fuse to form the zygote, the zygote gets diploid number of

chromosomes. Out of the total chromosomes , half the chromosomes are inherited from

the father and half from mother.

Thus both the parents contribute equal genes to the progeny.