

1. Why is reproduction essential for organisms?

Ans. Reproduction is the ability of living organisms to produce a new generation of living individuals. It enables a species to live generation after generation. It is essential because of the following:

- (i) It maintains the continuity of species.
- (ii) It maintains population of young adult and the aged persons.
- (iii) It introduces variations in the organisms, which are essential for adaptations and evolution.

2. Which is a better mode of reproduction sexual or asexual? Why?

Ans. Sexual reproduction is a better mode of reproduction than asexual mode because the **former contributes to the evolution of the species by introducing variation** in a population and occurs much more rapidly. Variation in population occurs due to the fusion of male and female gametes (sexual reproduction) carrying different sets of chromosomes.

3. Why is the offspring formed by asexual reproduction referred to as clone?

Ans. Asexual reproduction is a type of reproduction in which a single individual is capable of producing offsprings. These offsprings are not only genetically and morphologically similar to one another but are also similar to their parent. Clone is the term given to individuals that are genetically and morphologically similar. Thus the offsprings produced by asexual reproduction are called clones.

4. Offsprings formed due to sexual reproduction have better chances of survival. Why? Is this statement always true?

Ans. The offsprings that are produced by sexual reproduction are not genetically identical to their parents. They exhibit variations because they receive chromosomes from two different parents. Since they show variation, they are highly adapted to the changing environment while asexually produced organisms are genetically identical. So, during any calamity, there is a possibility that the whole generation would be destroyed leading to extinction of species.

5. How does the progeny formed from asexual reproduction differ from those formed by sexual reproduction?

Ans. Production of offsprings by a single parent without the formation and fusion of gametes is called asexual reproduction. It involves only mitotic cell division that gives rise to two nuclei having the same number of chromosomes as the parent cells. Thus the daughter cells that are produced are genetically identical to the parent cell without any variation in the genetic information

period of growth is called juvenile phase. This phase is known as vegetative phase in plants. This phase is of different durations in different organisms.

- (ii) Reproductive phase: The end of juvenile/vegetative phase marks the beginning of reproductive phase. During this phase, the organisms produce offsprings. In higher plants, this phase can be easily seen when they flower but in animals, the juvenile phase is followed by morphological and physiological changes prior to active reproductive behaviour. The reproductive phase is also of variable periods in different organisms like some plants that flower throughout the year while some others show seasonal flowering. In animals like some birds that lay eggs seasonally but when in captivity (as in poultry farms) can be made to lay eggs throughout the year. Placental female mammals, undergo cyclical changes in reproductive organs during this phase.
- (iii) Senescent phase: It begins from the end of the reproductive phase. During this last phase of life span, there is progressive deterioration in the body (like slowing of metabolism, etc). Old age ultimately leads to death.

9. Higher organisms have resorted to sexual reproduction inspite of its complexity. Why?

Ans. Higher organisms have resorted to sexual reproduction inspite of complexity because sexual reproduction results in multiplication and perpetuation of species and also contributes to evolution of species by introducing variation much faster than asexual reproduction in a particular population.

10. Explain why meiosis and gametogenesis are always interlinked?

Ans. Gametogenesis is the formation of male and female gametes inside the gametangia. Gametes are the haploid cells being produced by meiotic divisions. They form reproductive units in sexual reproduction. This implies that meiosis and gametogenesis are interlinked.

11. Identify each part in a flowering plant and write whether it is haploid (n) or diploid (2n).

- | | |
|-----------------------|-------------------|
| (i) Ovary _____ | (ii) Anther _____ |
| (iii) Egg _____ | (iv) Pollen _____ |
| (v) Male gamete _____ | (vi) Zygote _____ |

Ans.

| | |
|---------|---------|
| (i) 2n | (ii) 2n |
| (iii) n | (iv) n |

(v) n

(vi) 2n

12. Define external fertilization. Mention its disadvantages.

Ans. When fusion of the gametes take place outside the body of the organisms, it is called external fertilization or external syngamy. The external medium like water is required for this form of fertilization. Thus this form, is found in many aquatic animals like fishes, amphibians, majority of algae. Parents release eggs and sperms in the surrounding water, then fertilization and development of offsprings occur.

This type of fertilization has one disadvantage. The offspring produced are not protected from enemies and remain in threat till adulthood.

13. Differentiate between a zoospore and a zygote.

Ans. Zoospores are the microscopic, flagellated (motile) special asexual reproductive structures found in certain members of the kingdom Fungi and simple plants like algae whereas zygote is a diploid cell formed by the fusion of male and female gametes. This act of fusion is called fertilization.

Zoospores are the structures that give rise to new plants whereas zygote is a fertilization product that develops into mature organism.

14. Describe the post-fertilization changes in a flower.

Ans. In sexual reproduction, events that occur after the formation of zygote are called post-fertilization events.

In flowering plants, the zygote is formed inside the ovule. After fertilization the sepals, petals and stamens of the flower wither and fall off. But the pistil remains attached to the plant. The zygote develops into the embryo and the ovules develop into the seed. The ovary develops into the fruit that develops a thick wall called pericarp which is protective in function as shown in Fig. 1.17. After dispersal, seeds germinate under favourable conditions to produce new plants.

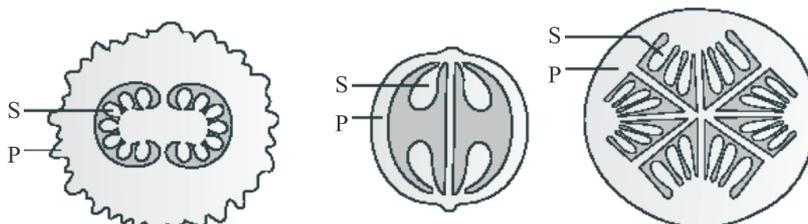


Fig. 1.17 A few kinds of fruits showing seeds (S) and protective pericarp (P)

15. Differentiate between gametogenesis from embryogenesis.

Ans.

| <i>Gametogenesis</i> | <i>Embryogenesis</i> |
|---------------------------------|--------------------------------|
| It is the formation of gametes. | It is the formation of embryo. |
| Gametes are the haploid cells. | Embryo is a diploid cell. |

16. What is a bisexual flower? Collect five bisexual flowers from your neighbourhood and with the help of your teacher find out their common and scientific names.

Ans. Flowers which bear both male and female sex organs are called bisexual flowers or hermaphrodites.

17. Examine a few flowers of any cucurbit plant and try to identify the staminate and pistillate flowers. Do you know any other plant that bears unisexual flowers?

Ans. Unisexual plants are those that bear either male reproductive structures or female reproductive structures. Papaya and date palm are the plants that bear unisexual flowers.

18. Why are offsprings of oviparous animals at a greater risk as compared to offsprings of viviparous animals?

Ans. In oviparous animals, the development of the zygote takes place outside the body of the female parent whereas in viviparous animals, it takes place inside the body of the female. Because in oviparous animals, the fertilized eggs are laid in the open environment where they are not protected from predators. Thus their survival rate is very less as compared to offsprings of viviparous animals.