

NCERT Solutions for Class-XII Biology

Chapter-1

NCERT Biology Class 12

1. Why is reproduction essential for organisms?
1. Reproduction is essential for organism because-
 - (1) It enables the continuity of species on the earth.
 - (2) It helps in transfer of variations from one generation to another.
 - (3) It is essential for survival of an individual.
2. Which is a better mode of reproduction sexual or asexual? Why?
2. Sexual reproduction is a better mode of reproduction. It allows the formation of new variants by the combination of the DNA from two different individuals, typically one of each sex. It involves the fusion of the male and the female gamete to produce variants, which are not identical to their parents and to themselves. This variation allows the individual to adapt to constantly changing and challenging environments. Also, it leads to the evolution of better suited organisms which ensures greater survival of a species. On the contrary, asexual reproduction allows very little or no variation at all. As a result, the individuals produced are exact copies of their parents and themselves.
3. Why is the offspring formed by asexual reproduction referred to as clone?
3. Offspring formed by asexual reproduction are always morphologically and genetically identical because they have the same gene as their parent, therefore referred to as clone.
4. Offspring formed due to sexual reproduction have better chances of survival. Why? Is this statement always true?
4. Sexual reproduction involves the fusion of the male and the female gamete. This fusion allows the formation of new variants by the combination of the DNA from two (usually) different members of the species. The variations allow the individuals to adapt under varied environmental conditions for better chances of survival. However, it is not always necessary that the offspring produced due to sexual reproduction has better chances of survival. Under some circumstances, asexual reproduction is more advantageous for certain organisms. For example, some individuals who do not move from one place to another and are well settled in their environment. Also, asexual reproduction is a fast and a quick mode of reproduction which does not consume much time and energy as compared to sexual reproduction.

5. How does the progeny formed from asexual reproduction differ from those formed by sexual reproduction?
5. The progeny formed from asexual reproduction is always morphologically and genetically identical or clone to their parents since they possess exact copies of DNA of their parent whereas in sexual reproduction DNA copying is accompanied by creation of new cellular apparatus. The cell divides and produces new cells, which exhibits variations. So, differences are found in morphological and physiological features of progeny as DNA copies generated during sexual reproduction are similar but not identical.
6. Distinguish between asexual and sexual reproduction. Why is vegetative reproduction also considered as a type of asexual reproduction?

6.

	Sexual reproduction	Asexual reproduction
1.	It involves the fusion of the male and female gamete.	It does not involves the fusion of the male and the female gamete
2.	It requires two (usually) different individuals.	It requires only one individual.
3.	The individuals produced are not identical to their parents and show variations from each other and also, from their parents.	The individuals produced are identical to the parent and are hence, called clones.
4.	Most animals reproduce sexually. Both sexual and asexual modes of reproduction are found in plants.	Asexual modes of reproduction are common in organisms having simple organizations such as algae and fungi.
5.	It is a slow process.	It is a fast process.

Vegetative propagation is a process in which new plants are obtained without the production of seeds or spores. It involves the propagation of plants through certain vegetative parts such as the rhizome, sucker, tuber, bulb, etc. It does not involve the fusion of the male and the female gamete and requires only one parent. Hence, vegetative reproduction is considered as a type of asexual reproduction.

7. What is vegetative propagation? Give two suitable examples.
7. Vegetative propagation is formation of new plant from vegetative parts or propagules of the parent .e.g.
 1. Stem tubers develop new plants in the region of eyes. e.g. potato.
 2. Tap root branches develop adventitious buds and form new plants. E.g. Guava
8. Define
 - (a) Juvenile phase,
 - (b) Reproductive phase,
 - (c) Senescent phase.

- 8.** (a) Juvenile phase:
It is the period of growth in an individual organism after its birth and before it reaches reproductive maturity.
- (b) Reproductive phase:
It is the period when an individual organism reproduces sexually.
- (c) Senescent phase:
It is the period when an organism grows old and loses the ability to reproduce.
- 9.** Higher organisms have resorted to sexual reproduction in spite of its complexity. Why?
- 9.** Higher organisms have resorted to sexual reproduction in spite of its complexity because sexual reproduction exhibits variations and these variations lead to evolution of better organisms and thus provides better chances of survival.
- 10.** Explain why meiosis and gametogenesis are always interlinked?
- 10.** Meiosis is a process of reductional division in which the amount of genetic material is reduced. Gametogenesis is the process of the formation of gametes. Gametes produced by organisms are haploids (containing only one set of chromosomes), while the body of an organism is diploid. Therefore, for producing haploid gametes (gametogenesis), the germ cells of an organism undergo meiosis. During the process, the meiocytes of an organism undergo two successive nuclear and cell divisions with a single cycle of DNA replication to form the haploid gametes.
- 11.** Identify each part in a flowering plant and write whether it is haploid (n) or diploid (2n).
- (a) Ovary _____
- (b) Anther _____
- (c) Egg _____
- (d) Pollen _____
- (e) Male gamete _____
- (f) Zygote _____
- 11.** (a) Ovary Diploid (2n)
(b) Anther Diploid (2n)
(c) Egg Haploid (n)
(d) Pollen Haploid (n)
(e) Male gamete Haploid (n)
(f) Zygote Diploid (2n)
- Since ovary & anther undergoes only mitotic divisions during their development in which chromosome number remains the same, so these structures are diploid. The zygote is formed by the fusion of both male and female gametes (haploid structures). So, when two haploid structures fuse the resultant is a diploid structure i.e. zygote.

Egg, pollen, male gamete undergoes meiosis during their development, which reduces the chromosome number to half, hence these are haploid structures.

12. Define external fertilization. Mention its disadvantages.

12. External fertilization is the process in which the fusion of the male and the female gamete takes place outside the female body in an external medium, generally water. Fish, frog, starfish are some organisms that exhibit external fertilization.

Disadvantages of external fertilization:

In external fertilization, eggs have less chances of fertilization. This can lead to the wastage of a large number of eggs produced during the process. Further, there is an absence of proper parental care to the offspring, which results in a low rate of survival in the progenies.

13. Differentiate between a zoospore and a zygote.

13.

Zoospore	Zygote
It is a motile flagellated non-motile diploid cell formed as Spore.	It is a result of fusion of male and female gametes.
It is asexual reproductive structure.	It is formed as a result of sexual reproduction.

14. Differentiate between gametogenesis from embryogenesis.

14.

Gametogenesis	Embryogenesis
It is the process of the formation of haploid male and female gametes from diploid meiocytes through the process of meiosis.	It is the process of the development of the embryo from the repeated mitotic divisions of the diploid zygote.

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

15. In post- fertilization changes the zygote divides many times and forms an embryo within the embryo. The ovule gets converted into seed and develops a tough coat. Ovary ripens as fruit and embryo develops into a seedling during germination.

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.

16. A flower that contains both the male and female reproductive structure (stamen and pistil) is called a bisexual flower. Examples of plants bearing bisexual flowers are:

- Water lily (*Nymphaea odorata*)
- Rose (*Rosa multiflora*)
- Hibiscus (*Hibiscus Rosa-sinensis*)
- Mustard (*Brassica nigra*)

➤ *Petunia (Petunia hybrida)*

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?
17. A staminate flower is a male flower as it bears only stamens whereas a pistillate flower is a female flower as it bears only pistils.
E.g. Of plants bearing unisexual flowers- Papaya, cucumber, watermelon, maize etc.
18. Why are offspring of oviparous animals at a greater risk as compared to offspring of viviparous animals?
18. Oviparous animals lay eggs outside their body. As a result, the eggs of these animals are under continuous threat from various environmental factors. On the other hand, in viviparous animals, the development of the egg takes place inside the body of the female. Hence, the offspring of an egg-laying or oviparous animal is at greater risk as compared to the offspring of a viviparous animal, which gives birth to its young ones.



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