NCERT Solutions for Class 12 Biology Chapter 1 Reproduction in Organism

Q1. Why is reproduction essential for organisms?

Answer:

Reproduction refers to the process of production of offsprings by living organisms. The offsprings produced are similar to their parents. These offsprings grow and become reproductively mature to leave their progenies. Therefore, this process repeats itself and a continuity of species is maintained generation after generation. If reproduction would not have been there, species would not be able to leave their progenies and sooner or later they might extinct. Thus, reproduction is essential for living organisms.

Q2. Which is a better mode of reproduction: sexual or asexual? Why?

Answer:

Among sexual and asexual reproduction, sexual reproduction is considered to be a better mode of reproduction. It is mainly because sexual reproduction tends to create more amount of variations among the organisms. It involves two parents which contribute the 50% of their genomes each to the zygote. As a result of this, offsprings have father's characters, mother's characters and some other unique characters also. The variations caused by sexual reproduction are essential as they help organisms in adjusting to dynamic environmental condition and responsible for survival and gradual evolution of species. On the contrary, in asexual reproduction, single parent produces the offspring and thus, these offsprings are similar to their parent. Due to this, they have no advantage over organisms produced by sexual reproduction. Thus, sexual reproduction is a better mode of reproduction then asexual reproduction.

Q3. Why is the offspring formed by asexual reproduction referred to as clone?

Answer:

The term clone refers to a group of genetically and morphologically similar individuals. In asexual reproduction, a single organism is able to give rise to offsprings. Due to this, the offsprings thus produced are copies of their parents. These offsprings are exact replicas of each other also. That is why the offsprings produced by asexual reproduction are referred to as a clone.

Q4. Offspring formed due to sexual reproduction have better chances of survival. Why? Is this statement always true?

Answer:

During sexual reproduction male and female gametes from male and female individuals respectively fuse with each other and form zygote. This zygote contains new combinations of DNA/genes that are a result of recombination and crossing over. Due to the presence of these new combinations of DNA, variations are caused. These variations allow organisms to survive in unfavourable conditions. This is the reason why offsprings formed due to sexual reproduction have better chances of survival over those formed due to asexual reproduction.

The above statement is not always true, because there have been instances when continuous sexual reproduction among species of a given population, causes a reduction in yield and reduces the chances of survival. It mainly occurs because, sometimes due to recombination, less desired combinations of DNA/genes are formed and they make species vulnerable to extreme conditions. Thus, the statement, offspring formed due to sexual reproduction have better chances of survival is not always true.

Q5. How does the progeny formed from asexual reproduction differ from those formed by sexual reproduction?

Answer:

The progeny formed from asexual reproduction differs from that formed from sexual reproduction in the following ways:

	Progeny formed from asexual reproduction	**Progeny formed from sexual reproduction**
1	These are formed from single parent	Their formation requires the involvement of two parents i.e. a male and female
2	The process of formation does not involve meiosis and crossing over	Formation of gametes involves meiosis and crossing over
3	These progenies are copies of their parents and of each other	These progenies are different from their parents and from each other

4	These progenies do not show genetic variations	These progenies show genetic variation due to crossing over and recombination

NCERT solutions for class 12 biology chapter 1 reproduction in organism:

Q6. Distinguish between asexual and sexual reproduction. Why is vegetative reproduction also considered as a type of asexual reproduction?

Answer:

Differences between sexual and asexual reproduction are as follows:

Asexual reproduction	Sexual reproduction
It involves a single parent	It involves two parents
There is no requirement of sex organs and gametes	Gamete formation occurs in sex organs
It involves somatic cells of the body	it involves germ cells of the body

Offsprings produced in asexual reproduction are exactly similar to their parent	offsprings produced in sexual reproduction are different from their parents
It occurs rapidly	It is a slow process
It occurs in unicellular organisms, lower invertebrates, plants etc.	It occurs in higher organisms

Vegetative reproduction is considered to be a type of asexual reproduction because

1. Vegetative reproduction is uniparental i.e. it involves a single parent.

2. The reproductive propagules of vegetative reproduction are somatic cells as in asexual reproduction.

3. Meiosis and fertilisation are absent in vegetative reproduction.

4. Vegetative reproduction does not cause variations. The offsprings produced are similar to their parent

Q7. What is vegetative propagation? Give two suitable examples.

Answer:

Vegetative propagation is a method of asexual reproduction in plants. In this method, a vegetative part of a plant gives rise to new plants. This vegetative part which has the ability to produce new plants is called vegetative propagule. Some common vegetative propagules are runner, rhizome, sucker, tuber, offset, bulb etc. Vegetative propagation is of two types i.e. natural vegetative propagation and artificial vegetative propagation. In natural vegetative propagation, a vegetative structure detaches from the parent plant and give rise to new plants. Artificial vegetative propagation includes methods developed by horticulturists to readily develop multiple plants through vegetative propagation.

The examples of vegetative propagation are:

1. Vegetative propagation by roots: Roots of some plants can develop adventitious buds to form new plants e.g. *Dalbergia* , guava, poplar, *Albizia, Murraya* etc. Fleshy roots such as those of sweet potato, tapioca, Dahlia etc. also develop adventitious buds and form new plants.

2. Vegetative propagation by leaves: The leaves of some plants develop buds over them. From these buds, new plants arise. E.g *Bryophyllum* .

Q8. Define

(a) Juvenile phase,

Answer:

All organisms have to reach a particular growth stage before they attain reproductive maturity. This pre-reproductive period of growth is called juvenile phase in animals. In

plants, this phase is known as the vegetative phase. The duration of the juvenile phase varies in different organisms.

(b) Reproductive phase

Answer:

Reproductive phase refers to that phase of an organisms' life cycle in which it attains reproductive maturity and become able to produce gametes and mate. This phase is marked by certain hormonal changes.

(c) Senescent phase.

Answer:

The senescent phase refers to the post-reproductive phase in which an organism not just loses its reproductive potential but also the rate of metabolism slows down and there is deterioration of vital activities of the body.

Q9. Higher organisms have resorted to sexual reproduction in spite of its complexity. Why?

Answer:

Higher organisms have resorted to sexual reproduction because sexual reproduction enables these organisms to survive during unfavorable conditions. It tends to induce genetic variability in these organisms which further becomes a cause of the evolution of better-adapted species.

Q10. Explain why meiosis and gametogenesis are always interlinked?

Answer:

Meiosis refers to the cell division which causes a reduction in the number of chromosomes by half and gametogenesis is the formation of male and female gametes. These two terms are often interlinked because gamete formation in diploid organisms occurs through meiosis only. The number of chromosomes in diploid organisms must be reduced to half because if this doesn't happen then the zygote after fertilisation would have 4n ploidy. Thus, gametogenesis and meiosis are interlinked.

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Q11. Identify each part in a flowering plant and write whether it is haploid (n) or diploid (2n).

(a) Ovary

Answer:

Diploid (2n)

The ovary is the part of the flower and its ploidy is 2n.

(b) Antheranswer

Answer:

Diploid (2n)

The anther is the male reproductive part of a flower. It is diploid (2n) i.e. it consists of 2 sets of chromosomes.

(c) Egg

Answer:

Haploid (n).

The egg is the female gamete and is formed by meiosis so it is haploid (n).

(d) Pollen

Answer:

Haploid (n)

Pollen grains are haploid i.e. they contain one set of chromosomes

(e) Male gamete

Answer:

Haploid (n)

Male gametes in plants are formed by mitosis in pollen grain which is a haploid structure. Thus, male gametes are haploid (n).

(f) Zygote

Answer:

Diploid (2n)

A zygote is formed after fertilisation of male and female gametes which are haploid (n). Thus, zygote is diploid (2n).

Q12. Define external fertilisation. Mention its disadvantages.

Answer:

External fertilisation refers to the fusion of male and female gametes outside the body of the organism. The disadvantages of external fertilisation are as follows:

1. External fertilisation requires an aquatic medium

2. Offsprings produced are highly vulnerable to predators

3. Parental care is not provided to offsprings

Q13. Differentiate between a zoospore and a zygote.

Answer:

The differences between zoospore and zygote are as follows:

Zoospore	Zygote
It is an asexual reproductive body	It is the result of sexual reproduction
Zoospores contain flagella, so they are motile	The zygote does not contain flagella, so it is non-motile

Zoospores can be haploid in some organisms and diploid in some others	A zygote is formed as a result of
Zoospores give rise to new individuals after germination	The zygote undergoes development to form an embryo which gives rise to new individual
These are formed in lower organisms	The zygote is formed in higher plants and animals

NCERT solutions for class 12 biology chapter 1 reproduction in organism:

Q14. Differentiate between gametogenesis from embryogenesis.

Answer:

Differentiation between gametogenesis and embryogenesis is as follows:

Gametogenesis	Embryogenesis

The process of formation of gametes is called gametogenesis	The process of formation of the embryo is called embryogenesis
This process involves meiotic divisions that lead to the formation of gametes	This process involves mitotic division that leads to the development of a zygote into an embryo
Gametogenesis leads to fertilisation	embryogenesis is followed by organogenesis

Q15. Describe the post-fertilisation changes in a flower.

Answer:

The post fertilisation changes that occur in a flower are as follows:

1. Formation of zygote occurs in the ovule. zygote further develops into an embryo.

2. The ovary develops into the fruit while the ovary wall develops into pericarp.

3. Ovules develop into seeds

4. Sepals, petals and stamens wither and fall off while pistils remain attached to the plant.

Q16. 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.

Answer:

Bisexual flowers are those flowers which possess both male and female reproductive parts i.e. stamen and pistil respectively. Some of the common bisexual flowers that you will be able to collect in your neighbourhood are given below:

Common name	Scientific name
Rose	*Rosa indica*
Sadabahar	*Catharanthus roseus*
China rose	*Hibiscus rosa-sinensis*
Tulsi	*Ocimum sanctum*

Q17. 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?

Answer:

Cucurbits bear unisexual flowers. These type of flowers bear either male or female reproductive organs. It means that a staminate flower bears only stamen i.e. male reproductive organ while pistillate flower contains only pistil i.e. female reproductive organ. So you can identify staminate and pistillate flowers on the basis of the presence of male and female parts respectively. Another example of a plant bearing unisexual flowers is maize.

Q18. Why are offspring of oviparous animals at a greater risk as compared to offspring of viviparous animals?

Answer:

Oviparous organisms are those organisms that lay fertilized or unfertilized eggs whereas viviparous organisms are the ones that give birth to young ones. The offsprings of oviparous animals are considered to be at a greater risk as compared to offsprings of viviparous animals because of the following reasons:

1. In oviparous animals, the development of offsprings occurs outside the body of the organism and they do not get proper protection and nourishment as in viviparous organisms.

2. The offsprings of oviparous organisms develop inside eggs made of calcareous shells. These eggs are prone to attack by predators

Hence, offsprings of oviparous animals are at a greater risk as compared to offsprings of viviparous animals.