Biology Reproduction in Organisms

1. Why is reproduction essential for organisms?

Ans: Reproduction is the ability of living organisms to produce a young one similar to itself. It ensures continuity of a species generation after generation. Reproduction introduces variation in the organisms. Useful variations are essential for adaptation and evolution. Therefore, it is essential for organisms.

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

Ans: Sexual reproduction is a better mode of reproduction because of the following reasons:

1. Variation : Since fusion of gametes from different parents occur during sexual reproduction, hence genetic recombination takes place causing variations.
2. Evolution : Variation being a major factor of natural selection, therefore, it plays an important role in evolution.
3. Adaptation : The offspring produced due to sexual reproduction adapt better to the changing environmental conditions.
4. Vigour and Vitality : Genetic recombination, interaction, etc. during sexual reproduction provide vigour and vitality to the offspring.

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 offspring. These offspring are not only genetically and morphologically similar to one another but also similar to their parent. Clone is the term given to individuals that are genetically and morphologically similar. Thus the offspring 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 obtained from sexual reproduction have better chances of survival because the genetic material of such organisms are formed from both

the parents. Daughter organisms/offsprings show variation that leads to the evolution of species.

This statement is always true. The offspring produced due to sexual reproduction adapt better to the changing environmental conditions. Genetic recombination, interaction, etc. during sexual reproduction provide vigour and vitality to the offspring.

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

Ans: Production of offspring by a single parent without the formation and fiision of gametes is called asexual reproduction. It involves only mitotic cell division that gives rise the daughter cells which are genetically identical to the parent cell. Sexual reproduction is the production of offspring by two parents, male and female. It involves meiotic cell divisions producing haploid nuclei which on fusion produce offspring that are genetically different from their parents.

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

Ans: The difference between asexual and sexual reproduction are as follows :

	Asexual reproduction	Sexual reproduction
1	It occurs only in invertebrates and lower chordates.	It occurs almost in all types of animals.
2	It is always uniparental.	It is usually biparental.
3	Gametes are not formed.	Two types of gametes are formed.
4	It involves only mitosis.	It involves both meiosis and mitosis.
5	Daughter organisms are genetically identical to the parent.	Daughter organisms genetically differ from their parents.
6	Since there is no variation, so it does not contribute to evolution of the species.	Because of variations, it contributes to the evolution of species.

In plants asexual reproduction is called vegetative reproduction because vegetative plant parts like rhizome, runner, sucker, tuber, bulb all are capable of producing off springs These parts give rise to daughter individuals without the involvement of two parents.

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

Ans: Vegetative propagation is the formation of new plants from vegetative units. In plants, the units of vegetative propagation are runner, rhizome, sucker, tuber, offset, bulb, etc. These are capable of producing new offsprings. These structures are called v vegetative propagules.

Modified tuberous roots of sweet potato, tapioca, yam, Dahlia and Tinospora can be propagated vegetatively when planted in soil. Small plants emerging from the buds (called eyes) of the potato tuber, from the rhizomes of banana and ginger are other examples.

8. Define:
(a)Juvenile phase
(b)Reproductive phase
(c)Senescent phase.
Ans: (a)Juvenile phase : All organisms have to reach a certain stage of growth and maturity in their life before they can reproduce sexually. That period of growth is called juvenile phase. However, this phase is known as vegetative phase in plants. This phase is of different durations in different organisms.
(b)Reproductive phase: The end of juvenile/ vegetative phase marks the beginning of reproductive phase. During this phase, the organisms produce offspring. In higher plants, this phase can be easily seen when they come to 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 period in different organisms like some plants, flower throughout the year while others show seasonal flowering. In animals like birds 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.
(c) Senescent phase: It begins from the end of the reproductive phase. During this 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 in spite of its complexity. Why?
Ans: Higher organisms have resorted to sexual reproduction in spite of its complexity because sexual reproduction results in multiplication and perpetuation of species and also contributes to evolution of species by introducing variation much more faster than asexual reproduction in a particular population. Sexual reproduction enables higher organisms to survive during unfavourable conditions.

10. Explain why meiosis and gametogenesis are always interlinked?
Ans: Gametogenesis is the process of formation of two types of haploid gametes (male and female). In gametogenesis, gametes are haploid in number and

formed by meiosis so the chromosome number is haploid. Thus gametogenesis is always linked with meiosis.

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 ————————
Ans: (a)2n (b)2n (c)n (d)n (e)n (f)2n

12. Define external fertilization. Mention its disadvantages.
Ans: When fusion of the gametes takes 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. This form, is found in many aquatic animals like fishes, amphibians, majority of algae.
In this, parents release eggs and sperms in the surrounding water, then fertilization and development of offspring occur externally. Disadvantages of external fertilization:
(i)if occurs only in aquatic medium.
(ii)A chance factor is involved requiring synchronous release of gametes nearby and absence of turbulence of water.
(iii)There is no protection to young ones. They are vulnerable to a number of predators.

13. Differentiate between a zoospore and a zygote.
Ans: The zoospore is flagellated, motile, haploid or diploid spore formed inside a zoosporangium. It is the result of asexual reproduction.

The zygote is always diploid and formed by the fusion of gametes. It is usually non- flagellated and non-motile or motile. It is the net result of sexual reproduction.

14. Differentiate between gametogenesis from embryogenesis.

Ans: Differences between gametogenesis and embryogenesis are as follows :

	Gametogenesis		Embryogenesis
1	It is the formation of male and female gametes.	1	It is the formation of embryo from the zygote.
2	Gametes are the haploid cells.	2	Embryo is a diploid cell.
3	Both mitotic & meiotic cell division take place.	3	Only mitotic division occur.

15. 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 die fruit that develops.a thick wall called pericarp which is protective in – function. After dispersal, seeds germinate under favourable conditions to produce new plants.

16. What is % 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 in which male and female sex organs (stamens and carpels) are borne on the same flowers are called bisexual flowers. You can observe following bisexual flowers in your kitchen and colony gardens :

(i)Brassica (sarson) – Brassica campestris

(ii)Onion – Allium cepa

(iii)Garden Pea (Edible pea) – Pisum sativum

(iv)Petunia – Petunia hybrida

(v)China rose (shoe flower) – Hibiscus rosa- sinensis.

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: The male or staminate flowers of cucurbits bear bright coloured petals and a prominent group of stamens. Male plants or staminate flowers do not bear fruits. The female or pistillate flowers bear fruits. In a fertilised young pistillate flower very small fruit is visible below petals and sepals. Some unisexual plants are : Papaya, Mulberry and Date-palm.

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

Ans: On the basis of the development of the zygote, animals are grouped into oviparous and viviparous. The oviparous animals such as reptiles and birds lay eggs. Their fertilised eggs are covered by hard calcareous shell and are laid in a safe place in the environment. After incubation period, young ones hatch out. In viviparous animals such as majority of mammals including human beings, the zygote develops into a young one inside the body of the female individual. After a certain growth period, the young ones are delivered by the female individual. Due to proper care and protection, the chances of survival of young ones are more in viviparous individuals. Oviparous offsprings are at a greater risk than viviparous ones.