

Modes of Reproduction

Very Short answer Questions

1. What is the dominant phase in the life cycle of an angiosperm?

A: Sporophyte phase (diploid phase).

2. What is meant by heterospory? Mention the two types of spores developed in an angiospermic plant?

A: Production of different kind of spores by a species is called Heterospory.

In Angiosperms the two different kinds of spores are microspores and megaspores.

3. Mention the modes of reproduction in Algae and Fungi?

A: **Algae:** 1. Vegetative reproduction by fragmentation.

2. Asexual reproduction by various types of spores.

3. Sexual reproduction by isogamy, anisogamy, oogamy.

Fungi: 1. Vegetative reproduction by fragmentation.

2. Asexual reproduction by various types of spores.

3. Sexual reproduction by oospores, ascospores, basidiospores.

4. How do Liverworts reproduce vegetatively?

A: Fragmentation of thallus.

By special structures called Gemmae.

5. Mention any two characteristics of bacteria and yeast that enable them to reproduce asexually?

A: 1. Simple thallus --- Both are unicellular.

2. Absence of gamete formation.

3. Small body size --- Both are microscopic.

6. Why do we refer to offspring formed by asexual method of reproduction as clones?

A: Asexual reproduction does not involve two parents and union of gametes. They produce special structures vegetatively or asexually that develop into offspring exactly resembling the parents. So they are called as clones.

7. Between an annual and perennial plant, which one has a shorter juvenile phase? Give one reason?

A: The juvenile or vegetative phase is shorter in annuals. Annual plants grow and mature before flowering – all within a year.

As perennial plants live for many years they take longer time to mature before they flower.

8. Rearrange the following events of sexual reproduction in the sequence in which they occur in a flowering plant?

Embryogenesis, Fertilization, Gametogenesis, Pollination.

A. Gametogenesis---- Pollination----- Fertilization----- Embryogenesis.

9. Is there a relationship between the size of an organism and its life span?

A: Yes. In plants, sexual reproduction initiates during unfavourable conditions. Smaller plants tend to live for shorter periods as they cannot withstand unfavourable conditions and reproduce sexually and complete their life cycles.

Huge perennial plants can withstand unfavourable conditions and reproduce year after year.

10. Give reasons as to why cell division can or cannot be a type of reproduction in multicellular organisms?

A: Reproduction is a biological process resulting in young ones.

1. In unicellular forms cell division results in the individuals.

In multicellular formation cell division results in the formation of tissue.

2. In multicellular forms division of labour is seen. Differentiation is required after cell division.

11. Which of the following are monoecious and dioecious organisms?

a. Date palm

b. Coconut

c. Chara

d. Marchantia

A. a.Date palm ----- Monoecious

b.Coconut ----- Monoecious

c.Chara----- Monoecious

d.Marchantia----- Dioecious

12. Match the following given in column A with the vegetative propagules given in column B?

Column-A

Column-B

i. *Bryophyllum*

a. Offset

ii. *Agave*

b. Eyes

iii. Potato

c. Leaf buds

iv. Water hyacinth

d. Fragmentation

v. *Chara*

e. Sucker

vi. *Mentha*

f. Bulbils

- A: i. *Bryophyllum* c. Leaf buds
ii. *Agave* f. Bulbils
iii. Potato b. Eyes
iv. Water hyacinth a. Offsets
v. *Chara* d. Fragmentation
vi. *Mentha* e. Sucker

13. What do the following parts of a flower develop into after fertilization?

- a) Ovary b) Stamens**
c) Ovules d) Calyx

- A: a) Ovary – Fruit
b) Stamens—Wither and fall off
c) Ovules --- Seeds
d) Calyx— Withers and falls off

14. Define vivipary with an example.

- A: Germination of seeds while still attached to the plant is called vivipary.
Eg: *Rhizophora*

SHORT ANSWER TYPE QUESTIONS

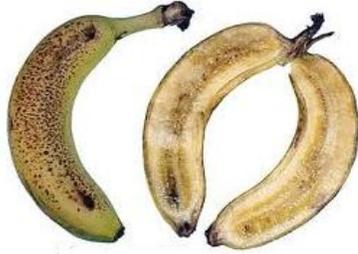
1. “Fertilization is not an obligatory event for fruit production in certain plants”. Explain the statement?

- A. Production of fruits without fertilization of ovules is called parthenocarpy. It is common in banana, grapes, and cucurbits. Parthenocarpy may be induced or natural. In natural parthenocarpy natural conditions like light or temperature or ploidy is responsible for production of parthenocarpic fruits. Photoperiod’s temperature variation can be the reason. Triploid plants cannot produce normal gametes that result in parthenocarpic fruits. e.g banana. In induced parthenocarpy different chemical compounds can induce stimulus for the development of the fruit without fertilization. e.g seedless cucumbers, watermelons. Plant growth regulators like auxins and gibberellins are used commercially to produce parthenocarpic fruits. Parthenocarpic fruits do not have seeds inside the fruit and also juicy or succulent.

Parthenocarpic fruits are advantageous because they are:

- 1) More succulent.

- 2) They are seedless and easy to eat.
- 3) With higher sugar content they are more desirable commercially.
- 4) Genetic variability is absent. Due to this all fruits are homogenous that increases market value.



2. List the changes observed in angiosperm flower subsequent to pollination and fertilization?

A. Event in sexual reproduction after the formation of zygote are called post fertilization events.

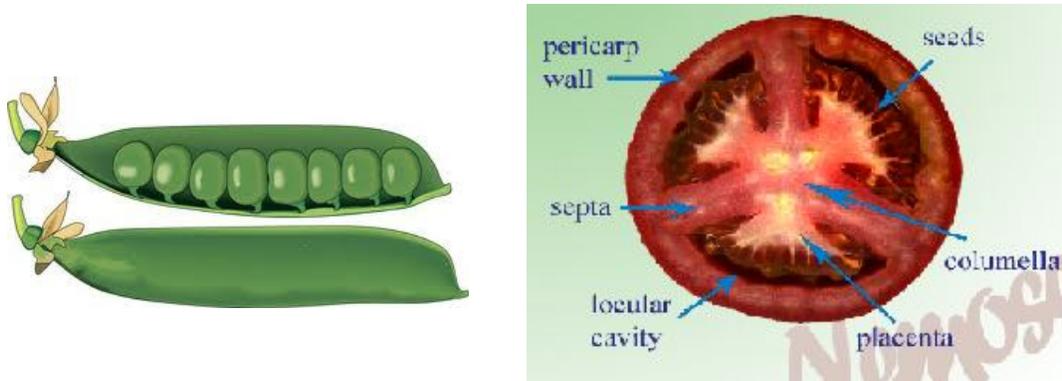
They are:

- 1) Calyx- corolla, stamens, style and stigma wither away.
- 2) Ovary -develops into fruit.
- 3) Ovules -develop into seeds.
- 4) The zygote develops into an embryo.
- 5) Primary endosperm nucleus develops into endosperm which provides nourishment to the developing embryo.
- 6) The synergid and antipodals degenerate after fertilization.
- 7) Funicle of the ovule changes into stalk of the seed.
- 8) Outer integument of the ovule changes into testa (outer seed coat). Inner integument changes into inner seed coat (Tegmen).
- 9) Micropyle changes into seed pore.
- 10) Hilum changes into scar of the seed.

3. Suggest a possible explanation why the seeds in a pea pod are arranged in a row where as the tomato are scattered in the juicy pulp?

A. **In Pea:** Fruit is legume. It is a dry dehiscent fruit developed from monocarpellary, unilocular and half superior ovary. At maturity, the fruit splits along the dorsal and ventral sutures and discharge its seeds. In Gynoecium with single carpel ovules are always attached to the ventral suture. This results in the fruit with marginal placentation. Thus the seeds are arranged in a row in legume (Pea) pod.

In tomato, the fruit is berry. It is fleshy fruit develop from superior or inferior ovary. In this, the margins of the carpels grow inwards to the centre of the ovary dividing the central chamber into compartments called locules. So that ovules are arranged at the central on the axis. Thus the seeds are attached to the central axis that is called axile placentation.

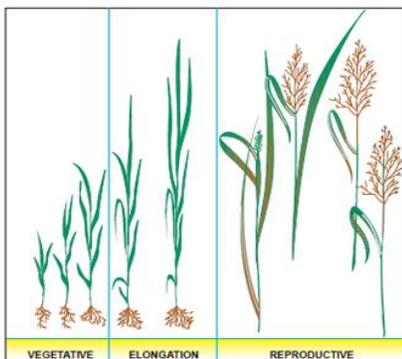


4. Justify the statement “Vegetative reproduction is also a type of asexual “reproduction”?”

A. In multicellular or colonial forms of algae, moulds and mushrooms, the body may break into smaller fragments. Each fragment thus formed develops into a mature individual. This process is called Fragmentation. Some plants have specialized structures for reproduction called Gemmae (in liverworts). In flowering plants, the units of vegetative propagation such as Runners, Stolons, Suckers, Offsets, Rhizome, Corm, Stem tuber, Bulb, Bulbil, Reproductive leaves, are cell capable of giving rise to new offsprings. These structures are called vegetative propagules. In all these plants, no involvement of union of gametes takes place. So the progeny looks like the parents without any variation and formed progeny are called clones.

5. Define (a) Juvenile phase and (b) Reproductive phase?

A. a) All organisms have to reach a certain stage of growth and maturity in their life, before they can reproduce sexually and this stage is known as Juvenile stage or vegetative phase. The longevity of the juvenile stage varies from plant to plant.
b) The stage which occurs after the juvenile stage, which can be seen easily in the higher plants when they come to flower is called reproductive phase. In this, reproduction occurs either by asexual or by sexual means produce offspring's.



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

A.

Asexual reproduction	Sexual reproduction
1. Single parent is involved.	1. Two parents take part in reproduction.
2. Offspring's is genetically identical to each other and to their parent.	2. Variations occur in offspring's due to genetic recombinations.
3. No fertilization.	3. Fertilization takes place.
4. No gametes are formed.	4. Gametes are involved.
5. No mixing of hereditary material.	5. Mixing of hereditary material.

In multicellular or colonial forms of algae, moulds and mushrooms, the body may break into smaller fragments. Each fragment thus formed develops into a mature individual. This process is called Fragmentation. Some plants have specialized structures for reproduction called Gemmae (in liverworts). In flowering plants, the units of vegetative propagation such as Runners, Stolons, Suckers, Offsets, Rhizome, Corm, Stem tuber, Bulb, Bulbil, Reproductive leaves, are cell capable of giving rise to new offspring's. These structures are called vegetative propagules. In all these plants, no involvement of union of gametes takes place. So the progeny looks like the parents without any variation and formed progeny are called clones.

So, vegetative reproduction is also an asexual reproduction.

7. 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 gametes ----- (f) Zygote?

A. (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)

8. Give a brief account on the phases of the life cycle of an angiosperm plant?

A. In the life cycle of an angiospermic plant, two phases occur alternately. They are:

A) Sporophytic phase: It is diploid (2n) and dominant phase of the life cycle. It is developed from the zygote. Reproductive organs develop on this plant.

B) Gametophytic phase: It is haploid (n). It is derived from a spore which is a product of meiotic division of spore mother cell. In angiosperms, microspore mother cells and megaspore mother cells are present. Microspore mother cells develop in an anther while megaspore mother cells develop from the nucellus of the ovule. Each of these cells in turn gives microspores and megaspores after meiotic division. These micro and megaspores develop into male and female gametophytes respectively. The male gametophytes give male gametes and the female gametophyte forms the egg cell. Male and female gametes (Egg) fuse to form a diploid zygote which develops into embryo in the seed. When the seed germinates, the embryo develops into sporophytic plant.

