

23

Reproduction in Organisms

TOPIC 1

Asexual Reproduction

- 01** Genera like *Selaginella* and *Salvinia* produces two kinds of spores. Such plants are known as

[NEET 2021]

- (a) homosorus (b) heterosorus
(c) homosporous (d) heterosporous

Ans. (d)

Heterosporous plants are the ones that produce two diverse sorts of spores, i.e. microspores and the megaspores. The microspores and megaspores germinate and give rise to male and female gametophyte in these plants and are retained on the parent sporophytes for variable periods, e.g. *Selaginella* and *Salvinia*.

- 02** Vegetative propagule in *Agave* is termed as

[NEET (Oct.) 2020]

- (a) rhizome (b) bulbil
(c) offset (d) eye

Ans. (b)

Vegetative propagule in *Agave* is bulbil. It develops as a small bud on the axial leaf and after falling on the soil, it develop into new plants.

- 03** Strobili or cones are found in

[NEET (Sep.) 2020]

- (a) *Pteris* (b) *Marchantia*
(c) *Equisetum* (d) *Salvinia*

Ans. (c)

Strobili or cones are found in *Equisetum*. *Equisetum* species have rhizomes that grow deep below the grounds surface.

Some species have cone-like structures called strobili that produce and house the plants spores for reproduction.

- 04** Which of the following statements is incorrect? [NEET (National) 2019]

- (a) *Claviceps* is a source of many alkaloids and LSD
(b) Conidia are produced exogenously and ascospores endogenously
(c) Yeasts have filamentous bodies with long thread-like hyphae
(d) Morels and truffles are edible delicacies

Ans. (c)

The statement "yeasts have filamentous bodies with long thread-like hyphae" is incorrect. Correct information about the statement is as follows.

Yeast is a unicellular sac fungus which lacks filamentous structures or hyphae. However, they may form short temporary filamentous structure called pseudomycelium. Rest statements are correct.

- 05** Offsets are produced by

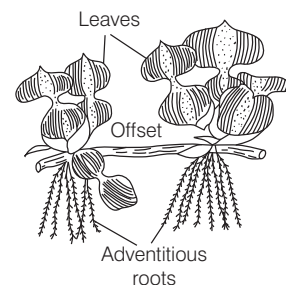
[NEET 2018]

- (a) parthenocarpy
(b) mitotic divisions
(c) meiotic divisions
(d) parthenogenesis

Ans. (b)

Offsets are produced by **mitotic divisions**. They are one internode long runners that occur in some aquatic plants. Breaking of offsets helps in vegetative propagation. They give rise to new plants, e.g. *Eichhornia*. **Meiotic divisions** occur in only germ cells.

Parthenocarpy is the development of seedless fruits. **Parthenogenesis** can be defined as the development of an egg into a complete individual without fertilisation.



Offset of water hyacinth (*Eichhornia*)

- 06** Which one of the following statements is not correct? [NEET 2016, Phase II]

- (a) Offspring produced by the asexual reproduction are called clone
(b) Microscopic, motile asexual reproductive structures are called zoospores
(c) In potato, banana and ginger, the plantlets arise from the internodes present in the modified stem
(d) Water hyacinth, growing in the standing water, drains oxygen from water that leads to the death of fishes

Ans. (c)

Statement (c) is incorrect as in potato, banana and ginger new plantlets always arise from the nodes of the modified stem.

Internodes are the area between the two nodes.

07 Which of the following pairs is not correctly match?

[CBSE AIPMT 2015]

Mode of reproduction	Example
(a) Offset	Water hyacinth
(b) Rhizome	Banana
(c) Binary fission	<i>Sargassum</i>
(d) Conidia	<i>Penicillium</i>

Ans. (c)

The plant body *Sargassum* is a diploid sporophyte. It does not multiply asexually by means of spores. Instead it reproduce by vegetative means, i.e. fragmentation which is the only known method of vegetative reproduction in the free floating species of *Sargassum*.

08 Which one of the following is correctly matched?

[CBSE AIPMT 2012]

- (a) Onion - Bulb
 (b) Ginger - Sucker
 (c) *Chlamydomonas* - Conidia
 (d) Yeast - Zoospores

Ans. (a)

The correctly matched pair is onion-bulb. Onion is a simple tunicated layered bulb while ginger is a straggling rhizome having uniparous cyme branching with sympodial axis. While yeast reproduces by budding and *Chlamydomonas* by zoospores.

09 Which one of the following is correctly matched?

[CBSE AIPMT 2012]

- (a) Onion - Bulb
 (b) Ginger - Sucker
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 (d) Yeast - Zoospores

Ans. (a)

Onion is a simple tunicated layered bulb while ginger is a straggling rhizome having uniparous cyme branching with sympodial axis.

10 The 'Eyes' of the potato tuber are

[CBSE AIPMT 2011]

- (a) flower buds
 (b) shoot buds
 (c) axillary buds
 (d) root buds

Ans. (c)

Tuber is oval or spherical swollen underground modified stem lacking adventitious roots.

It possesses a number of spirally arranged depression called eyes. Each eye represents node and consists of 1-3 axillary buds in the axils of small scaly leaves.

11 Vegetative propagation in *Pistia* occurs by

[CBSE AIPMT 2010]

- (a) stolon (b) offset
 (c) runner (d) sucker

Ans. (b)

Vegetative propagation in *Pistia* occurs by offset. Offsets are branches originated from the mainstem and upper portion of each branch is curved bearing a group of leaves while lower portion bearing roots. Each branch when separate can grow independently forming a new plant.

12 Vegetative propagation in mint occurs by

[CBSE AIPMT 2009]

- (a) offset (b) rhizome
 (c) sucker (d) runner

Ans. (c)

Vegetative propagation in mint occurs by sucker. These develop from the nodes of underground stem and comes up obliquely above the ground in the form of shoots. It also takes place in *Chrysanthemum*.

13 In which one pair both the plants can be vegetatively propagated by leaf pieces?

[CBSE AIPMT 2005]

- (a) *Agave* and *Kalanchoe*
 (b) *Bryophyllum* and *Kalanchoe*
 (c) *Asparagus* and *Bryophyllum*
 (d) *Chrysanthemum* and *Agave*

Ans. (b)

Marginal notches in *Kalanchoe* and *Bryophyllum* possess adventitious buds in their leaves for vegetative propagation.

14 During regeneration modification of an organ to other organ is known as

[CBSE AIPMT 2001]

- (a) morphogenesis
 (b) epimorphosis
 (c) morphallaxis
 (d) acropmaruy growth

Ans. (b)

Epimorphosis is the replacement of a lost organ of the body by proliferating new cells from the surface of the wound or injured part.

Morphogenesis (Gr. *morphe*=form and *genesis*=origin) is the growth, shaping and arrangement of body parts according to genetically predefined patterns. The extent direction and rate of morphogenesis depend on genetic controls and environmental factors.

15 A population of genetically identical individuals, obtained from asexual reproduction is

[CBSE AIPMT 1993]

- (a) callus
 (b) clone
 (c) deme
 (d) aggregate

Ans. (b)

Clone refers to the population of genetically identical individuals obtained from asexual reproduction or produced vegetatively from single organism. An individual member of a clone is called ramete.

16 Vegetative reproduction of *Agave* occurs through

[CBSE AIPMT 1991]

- (a) rhizome (b) stolon
 (c) bulbils (d) sucker

Ans. (c)

Vegetative propagation of *Agave* occurs by bulbils. These are condensed axillary bud capable of giving rise to shoots, i.e. independent plant.

TOPIC 2 Sexual Reproduction

17 Which of the following plant is monoecious?

[NEET 2021]

- (a) *Carica papaya*
 (b) *Chara*
 (c) *Marchantia polymorpha*
 (d) *Cycas circinalis*

Ans. (b)

When male and female reproductive structures are present on same plant it is called monoecious condition, whereas when both reproductive structures are present on different plants then this condition is called dioecious.

Chara is monoecious. It has oogonium (female organ) and antheridium (male organ) on the same plant.

Other options are incorrect because *Carica papaya* (papayas) *Marchantia polymorpha* and *Cycas circinalis* (gymnosperm) are all dioecious plants.

18 Which one of the following flowers only once in its lifetime?

[NEET 2018]

- (a) Mango
- (b) Jackfruit
- (c) Bamboo species
- (d) Papaya

Ans. (c)

Bamboo plants are perennial, monocarpic plants. They flower only once in their lifetime, usually after 50–100 years. They produce large number of fruits and die. **Mango**, **Jackfruit** and **Papaya** are polycarpic plants, i.e. they flower repeatedly at regular intervals every year.

19 Which one of the following generates new genetic combinations leading to variation?

[NEET 2016, Phase II]

- (a) Vegetative reproduction
- (b) Parthenogenesis
- (c) Sexual reproduction
- (d) Nuclear polyembryony

Ans. (c)

The sexual reproduction brings about variation through genetic recombinations. First of all genetic recombination occurs in non-homologous chromosomes during crossing over of pachytene stage in meiotic cell division. Secondly, the random union of gametes also contributes in forming new combinations of characters. Other options (a), (b) and (d) do not contribute in the formation of progenies with new variations.

Vegetative reproduction occurs through vegetative parts of organisms (plants). **Parthenogenesis** is formation of new individual without fertilisation (e.g. frog).

20 Match column I with column II and select the correct option using the codes given below

[NEET 2016, Phase II]

Column I	Column II
A. Pistils fused together	1. Gametogenesis
B. Formation of gametes	2. Pistillate
C. Hyphae of higher ascomycetes	3. Syncarpous
D. Unisexual female flower	4. Dikaryotic

Codes

- | | | | | |
|-----|---|---|---|---|
| | A | B | C | D |
| (a) | 4 | 3 | 2 | 1 |
| (b) | 2 | 1 | 4 | 3 |
| (c) | 1 | 2 | 4 | 3 |
| (d) | 3 | 1 | 4 | 2 |

Ans. (d)

- (a) Pistils fused together – Syncarpous
- (b) Formation of gametes – Gametogenesis
- (c) Hyphae of higher ascomycetes – Dikaryotic
- (d) Unisexual female flower – Pistillate

Concept Enhancer Always remember, in Biology the latin word “*Syn*” signifies togetherness or fusion.

21 Select the wrong statement.

[NEET 2013]

- (a) Isogametes are similar in structure, function and behaviour
- (b) Anisogametes differ either in structure, function and behaviour
- (c) In oomycetes female gamete is smaller and motile, while male gamete is larger and non-motile
- (d) *Chlamydomonas* exhibits both isogamy and anisogamy and *Fucus* shows oogamy

Ans. (c)

Oomycetes include water moulds, white rusts and downy mildews. In these, female gamete is larger and non-motile, whereas, male gamete is smaller and motile. Isogametes are found in algae like *Ulothrix*, *Chlamydomonas*, *Spirogyra*, etc., which are similar in structure, function and behaviour.

Anisogametes are found in *Chlamydomonas* in which one gamete is larger and non-motile and the other one is motile and smaller. Oogamy is the fusion of non-motile egg with motile sperm. The gametes, differ both morphologically as well as physiologically. It occurs in *Chlamydomonas*, *Fucus*, *Chara*, *Volvox*, etc.

22 Product of sexual reproduction generally generates

[NEET 2013]

- (a) longer viability of seeds
- (b) prolonged dormancy
- (c) new genetic combination leading to variation
- (d) large biomass

Ans. (c)

Sexual reproduction leads to new genetic combination leading to variation in new products.

Longer viability of seeds, prolonged dormancy and large biomass are not related to sexual reproduction.

23 Why is vivipary an undesirable character for annual crop plants?

[CBSE AIPMT 2005]

- (a) It reduces the vigour of the plant
- (b) It adversely affects the fertility of the plant
- (c) The seeds exhibit long dormancy
- (d) The seeds cannot be stored under normal conditions for the next season

Ans. (d)

Vivipary is the condition when seeds germinate on the plant. It is an undesirable character for annual crop plants because germinated seeds cannot be stored under normal conditions for the next season.

24 In oogamy, fertilisation involves

[CBSE AIPMT 2004]

- (a) a small non-motile female gamete and a large motile male gamete
- (b) a large non-motile female gamete and a small motile male gamete
- (c) a large non-motile female gamete and a small non-motile male gamete
- (d) a large motile female gamete and a small non-motile gamete

Ans. (b)

In oogamous type of sexual reproduction, the female gamete (ovum/egg) is big, Passive while male gametes (spermatozooids) are smaller, active and motile.

25 The process of series of changes from larva to adult after embryonic development is called
[CBSE AIPMT 1999]

- (a) regeneration
- (b) metamorphosis
- (c) growth
- (d) ageing

Ans. (b)

Metamorphosis (*meta*=change, *morphe*=form) is a process by which an animal under goes a comparatively rapid change from larval to adult form.

Regeneration is regrowth of the part of body which has been removed due to the injury or other causes. Growth is an increase in dry mass of an organism.

Ageing is progressive deterioration in activity of cell, tissues, organs, etc.

26 A perennial plant differs from biennial in [CBSE AIPMT 1995]

- (a) having underground perennating structure
- (b) having asexual reproductive structures
- (c) being tree species
- (d) not dying after seasonal production of flowers

Ans. (d)

Perennial plants have life span of more than two years, these may be herbs, shrubs or trees. **Biennials** are those plants which complete their life cycle in two years. These plants are usually herbs.

27 Syngamy means [CBSE AIPMT 1991]

- (a) fusion of gametes
- (b) fusion of cytoplasm
- (c) fusion of two similar spores
- (d) fusion of two dissimilar spores

Ans. (a)

Syngamy refers to the fusion of male and female gametes or compatible gametes. It is also known as fertilisation.

In seed plants, fertilisation/syngamy occurs with the help of pollen tube and is known as siphonogamy.

28 New banana plants develop from [CBSE AIPMT 1990]

- (a) rhizome
- (b) sucker
- (c) stolon
- (d) seed

Ans. (b)

New banana plants develop through sucker, Sucker is the sub-aerial modification of stem which originates from the basal and underground portion of main stem. It grows obliquely upwards giving rise to leafy shoot or a new plant. It also occurs in mint, *Chrysanthemum*, etc.