

Chapter 1

Reproduction in Organisms

Solutions

SECTION - A

Objective Type Questions

(Life Span, Basic Features of Reproduction, Types of Reproduction, Asexual Reproduction)

1. In the process of asexual reproduction
 - (1) Large number of individuals are produced due to involvement of reduction division
 - (2) Individuals are genetically similar to one another but not to their parent
 - (3) There is no need to search for a mate
 - (4) Gametes may or may not be fused

Sol. Answer (3)

No gametic union takes place.

2. Members of which of the following groups reproduce through special asexual reproductive structures?
 - (1) Algae, Bryophytes
 - (2) Fungi, Algae
 - (3) Pteridophytes, Angiosperms
 - (4) Fungi, Pteridophytes

Sol. Answer (2)

Algae → Zoospores, Aplanospores etc.

Fungi → Zoospores, Conidia etc.

3.

Zoospore, Conidia, Tuber, Offset, Pollen, Zygote

From the structures given in above box how many are not associated with asexual reproduction?

- | | |
|-----------|---------|
| (1) Three | (2) Two |
| (3) Four | (4) One |

Sol. Answer (2)

Pollen, Zygote

4. In vegetative propagule of potato and *Bryophyllum* new plants arise from respectively
- | | |
|------------------------------------|------------------------------------|
| (1) Axillary bud, Adventitious bud | (2) Adventitious bud, Axillary bud |
| (3) Axillary bud, Axillary bud | (4) Leaf bud, Axillary bud |

Sol. Answer (1)

Axillary bud → Potato

Adventitious bud A → *Bryophyllum*

5. Fleshy buds in aquatic plants are known as
- | | |
|-------------|-------------|
| (1) Bulbils | (2) Offset |
| (3) Turions | (4) Rhizome |

Sol. Answer (3)

Turion → *Potamogeton*

6. Study the following statements and choose the correct option.
- Life spans of organisms are correlated with sizes.
 - Death of all individuals is certain
 - The organism's habitat, internal physiology etc. are collectively responsible for how it reproduces.
 - When offspring is produced by single parent with or without involvement of gametes formation is called asexual reproduction.
- | | |
|------------------------|-------------------------|
| (1) I, II are correct | (2) III, IV are correct |
| (3) I, III are correct | (4) II, IV are correct |

Sol. Answer (2)

7. A portion of underground stem bearing bud forms a new plant in
- | | |
|---|--|
| (1) <i>Adiantum</i> , <i>Colocasia</i> and <i>Vallisneria</i> | (2) <i>Narcissus</i> , <i>Gladiolus</i> and <i>Freesia</i> |
| (3) Garlic, Onion and Water hyacinth | (4) Turmeric, Ginger and Strawberry |

Sol. Answer (2)

Narcissus → Bulb

Gladiolus → Corm

Freesia → Corm

8. Which of the following statement about vegetative reproduction is incorrect?
- Stem cutting is a common horticultural method of plant propagation
 - In trench layering, the basal branch may pegged at several places in soil at regular intervals
 - Stock has large diameter than scion in crown grafting
 - Gootee is an ancient method of propagation in subtropical trees and shrubs

Sol. Answer (2)

9. Grafting method can be used
- | | |
|---|---------------------------------|
| (1) In all tracheophytes | (2) Only in gymnospermic plants |
| (3) In cambium containing eustelic plants | (4) Only in atactostelic plants |

Sol. Answer (3)

Eustele cambium presenting ring

10. Study the following statement and choose the correct option

- I. Asexual reproduction is common among single celled organisms and organisms with relatively simple organisation.
- II. Conidia, bud, gemmules are common sexual structures.
- III. Runner, rhizome, sucker, tuber, offset, bulb are vegetative propagules.
- IV. The invasive weeds found growing in fresh water bodies is *Zostera*.

- (1) I, II are correct
- (2) III, IV are correct
- (3) I, III are correct
- (4) II, IV are correct

Sol. Answer (3)

11. Choose the correct options from the following

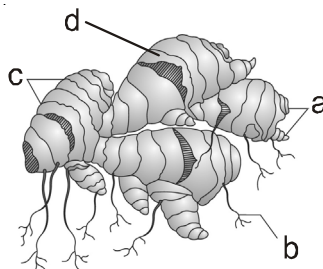
- I. Annual and biennial plants show clear cut vegetative, reproductive and senescent phases.
- II. Bamboo species flower only once in life generally after 50-100 years.
- III. *Strobilanthus kunthiana* is a monocarpic plant which flowers only once-after 6 years.

- (1) I, III are correct
- (2) II is correct
- (3) I, II are correct
- (4) III is correct

Sol. Answer (3)

Bamboo – Monocarpic

12. Examine the figure given below and select the correct option for labelled parts a, b, c, d.



- | | |
|-----------------------|-----------------------|
| (1) a – Buds | (2) a – Nodes |
| b – Adventitious root | b – Adventitious root |
| c – Leaves | c – Leaves |
| d – Nodes | d – Buds |
| (3) a – Buds | (4) a – Nodes |
| b – Adventitious root | b – Adventitious root |
| c – Nodes | c – Buds |
| d – Leaves | d – Leaves |

Sol. Answer (3)

13. From the given categories of bud choose the one which is present on potato tuber?

Nodal bud, Adventitious bud, Axillary bud,
Leaf bud, Extra-axillary bud

- | | |
|--------------------------------|-----------------------------|
| (1) Adventitious, axillary bud | (2) Nodal, axillary bud |
| (3) Leaf, extra-axillary bud | (4) Nodal, adventitious bud |

Sol. Answer (2)

Nodal and Axillary buds

(Sexual Reproduction, Events in Sexual Reproduction)

14. Select the incorrect statement

- (1) Zygote is thick walled diploid sexual spore
- (2) Flowers are bisexual in sweet potato
- (3) *Ulothrix* shows external fertilisation
- (4) The nucule in *Chara* has a cap of five coronary cells

Sol. Answer (1)

Zygote is thin walled.

15. Choose correct option w.r.t. following structures

		Cellular structure	Flagella	Wall
(a)	Zoospore	Unicellular	Present	Thick
(b)	Conidia	Unicellular	Absent	Thin
(c)	Gamete	Unicellular	Can be present	Thick

- (1) (a) & (b) (2) (b) & (c) (3) (a) & (c) (4) (b) only

Sol. Answer (4)

16. Choose correct option for asexual and sexual reproduction in organisms that have a relatively simple organisation.

	Feature	Asexual reproduction	Sexual reproduction
(a)	Condition	Favourable	Unfavourable
(b)	Occurrence	More	Less
(c)	Structures	Spore	Gamete
(d)	Division	Meiosis	Mitosis

- (1) (a) & (d) (2) (b) & (c) only (3) (a), (b) & (c) (4) (c) & (d)

Sol. Answer (3)

17. Which of the following plants produce non-motile male gametes?

- (1) *Ulothrix*, *Marchantia* (2) *Strobilanthus*, *Chara* (3) *Spirogyra*, *Ulothrix* (4) *Mangifera*, *Pinus*

Sol. Answer (4)

Mangifera → Angiosperm

Pinus → Gymnosperm

18. Clear cut distinction between vegetative, reproductive and senescent phase is shown by

- (1) All annuals and perennials (2) All biennial and perennials
(3) All annuals and biennials (4) All perennials

Sol. Answer (3)

Only monocarpic plants

19. In few fungi and most of the algae

- (1) ♂ gamete – motile, ♀ gamete – motile
- (2) ♂ gamete – non-motile, ♀ gamete – non-motile
- (3) ♂ gamete – non-motile, ♀ gamete – motile
- (4) ♂ gamete – motile, ♀ gamete – non-motile

Sol. Answer (1)

Isogamy or Anisogamy

20. Select correct option w.r.t. chromosomes number in sexual life cycle of apple.

- (1) Megasporeocyte - 34; Microspore - 17; PEN - 51
- (2) Oosphere - 34; Nucellus - 34; Pollengrain - 17
- (3) Meiospore - 34; Microspore - 17; Embryo - 34
- (4) Meiocyte - 34; Sporocyte - 34; Pollen tetrad - 34

Sol. Answer (1)

Megasporeocyte $\rightarrow 2n \rightarrow 34$ Microspore $\rightarrow n \rightarrow 17$ PEN $\rightarrow 3n \rightarrow 51$

21. Choose correct option w.r.t. division during gamete formation and division in zygote for organisms having haplontic life cycle respectively.

- (1) Mitosis, mitosis (2) Meiosis, meiosis (3) Mitosis, meiosis (4) Meiosis, mitosis

Sol. Answer (3)

Organism is haploid so undergo mitosis to form male gamete and zygote undergoes meiosis to make haploid gametophyte.

22. Which of the following plant groups shows internal fertilisation only?

- (a) Algae (b) Bryophytes
- (c) Pteridophytes (d) Fungi
- (1) (b) & (c) (2) (a) & (b) (3) (c) & (d) (4) (a) & (c)

Sol. Answer (1)

In bryophytes and pteridophytes fertilization takes place in archegonia.

23. Which of the following features cannot be shown by structure which is vital link between two generations ensuring continuity of species?

- (a) Thick walled (b) Multicelled (c) One set of chromosomes
- (d) Meiocyte (e) Resting structure
- (1) (a), (b) & (e) (2) (a), (b) & (d) (3) (b) & (c) (4) (d) & (e)

Sol. Answer (3)

24. Organisms showing internal fertilisation shows reduction in number of _____ gamete and increase in number of _____ gamete.

- (1) ♂, ♀ (2) Sperm, eggs (3) ♀, ♂ (4) Male, female

Sol. Answer (3)

Oogamous reproduction

25. Choose correct option w.r.t. features of different plant groups

	Group	Embryo	Gametes	Asexual spore
(1)	Bryophytes	Present	Homogamete	Absent
(2)	Pteridophytes	Present	Homogamete	Present
(3)	<i>Ulothrix</i>	Absent	Homogamete	Present
(4)	Gymnosperms	Absent	Heterogamete	Present

Sol. Answer (3)

26. Synchrony between the maturity of sexes and release of large number of gametes is shown by

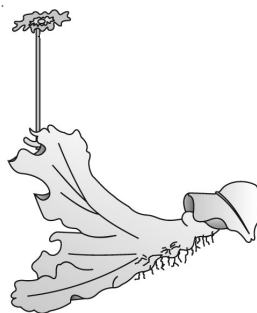
- (1) All spermatophytes (2) All bryophytes
(3) Most of the algae (4) Most of the land plants

Sol. Answer (3)

External fertilization

27. Choose correct option w.r.t. given bellow thallus

- (1) Produce male gamete
(2) Form sexual branches as antheridiophore
(3) After fertilisation possess zygote
(4) More than one option is correct



Sol. Answer (4)

(1) and (2) options

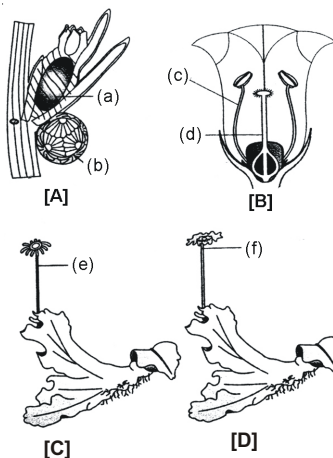
28. Which of the following represents the correct sequence of phases in the life cycle of wheat? [where J - Juvenile phase, R - Reproductive phase, I - Interflowering period, G - Gap phase, S - Senescence, V - Vegetative phase]

- (1) $V \rightarrow I \rightarrow R \rightarrow G \rightarrow S$ (2) $J \rightarrow R \rightarrow G \rightarrow R \rightarrow S$
(3) $J \rightarrow R \rightarrow S$ (4) $V \rightarrow R \rightarrow S \rightarrow G$

Sol. Answer (3)

Juvenile phase $\rightarrow$ Reproductive phase $\rightarrow$ Senescence

29. Examine the figures A, B, C & D given below and select the right option for female sex organs.



- (1) a, d & f (2) b, d & f (3) a, c & e (4) a, d & e

Sol. Answer (4)

a - Nucule

d - Carpel

e - Archegoniphore

30. Read the following statement carefully: "Further development of zygote depends on the type of life cycle the organism has and the environment it is exposed to."

Identify the correctly matched pair w.r.t. the above statement.

- | | |
|---|-----------------------------|
| (1) Thick walled zygote | – Haplontic life cycle |
| (2) Zygote forms new generation, by mitosis, represented by few cells | – Haplodiplontic life cycle |
| (3) Zygote undergoes meiosis to form haploid generation | – Diplontic life cycle |
| (4) Zygote forms multicellular diploid generation | – Haplontic life cycle. |

Sol. Answer (1)

Thick wall zygospore in adverse condition.

31. The vital link that ensures continuity of species between organisms of one generation and next are all, except

- (1) Zygospore (2) Oospore (3) Zygote (4) Oosphere

Sol. Answer (4)

Oosphere → n

32. Choose the correct options

- I. Gametes are always produced from diploid parent plant body.
- II. Meiocytes are sporocytes in all plants.
- III. The gymnosperms and pteridophytes have diploid parent body.
- IV. In seed plants, pollen grains are carrier of male gametes.

- (1) I, II are correct (2) III, IV are correct
(3) I, III are correct (4) II, IV are correct

Sol. Answer (2)

Gymnosperm }
Pteridophyte } 2n body dominant

Angiosperm }
Gymnosperm } Siphonogamy (Seed plants)

33. Choose the correct option from following statements.

- I. During embryogenesis, zygote undergoes mitotic cell division.
- II. In organisms with diplontic life cycle, zygote divides by meiotic cell division.
- III. The pericarp (fruit wall) develop from integument of ovule, after fertilization.
- IV. In brinjal, sepals remained attached to fruit even after fertilization.

- (1) I, II are incorrect but III, IV are correct (2) III, IV are incorrect but II, III are correct
(3) I, IV are incorrect but II, III are correct (4) II, III are incorrect but I, IV are correct

Sol. Answer (4)

34. The progenitor of the next generation in mature seed is
(1) Gamete (2) Spore (3) Oospore (4) Embryo

Sol. Answer (4)

Embryo $\rightarrow 2n$ (Next generation sporophyte)

35. What is the carrier of ♂ gamete in the *Pinus*, *Marchantia*, Mango, *Chara*, *Funaria* respectively?

[where A - Pollen tube, B - H_2O]

- (1) A, B, B, A, A (2) A, B, A, B, B
(3) B, A, A, B, A (4) A, B, A, A, B

Sol. Answer (2)

36. In cutting method, auxin hormone is used to

- (1) Develop shoots (2) Initiate leaves
(3) Initiate roots (4) Develop floral buds

Sol. Answer (3)

37. In which of the following plant, grafting is not possible?

- (1) Plum (2) Pear
(3) Mango (4) Maize

Sol. Answer (4)

SECTION - B

Previous Years Questions

1. Offsets are produced by [NEET-2018]
(1) Meiotic divisions (2) Mitotic divisions (3) Parthenogenesis (4) Parthenocarpy

Sol. Answer (2)

Offset is a vegetative part of a plant, formed by mitosis.

- Meiotic divisions do not occur in somatic cells.
- Parthenogenesis is the formation of embryo from ovum or egg without fertilisation.
- Parthenocarpy is the fruit formed without fertilisation, (generally seedless)

2. Which of the following flowers only once in its life-time? [NEET-2018]
(1) Bamboo species (2) Jackfruit (3) Papaya (4) Mango

Sol. Answer (1)

Bamboo species are monocarpic i.e., flower generally only once in its life-time after 50-100 years.

Jackfruit, papaya and mango are polycarpic i.e., produce flowers and fruits many times in their life-time.

3. Which one of the following statements is **not** correct? [NEET(Phase-2)-2016]
(1) Offspring produced by the asexual reproduction are called clone
(2) Microscopic, motile asexual reproductive structures are called zoospores
(3) In potato, banana and ginger, the plantlets arise from the internodes present in the modified stem
(4) Water hyacinth, growing in the standing water, drains oxygen from water that leads to the death of fishes

Sol. Answer (3)

In potato, banana and ginger, the plantlets arise from the nodes present on modified stem.

4. Which one of the following generates new genetic combinations leading to variation? **[NEET(Phase-2)-2016]**
- (1) Vegetative reproduction (2) Parthenogenesis
(3) Sexual reproduction (4) Nucellar polyembryony

Sol. Answer (3)

Sexual reproduction generates new genetic recombination leading to variations.

5. In bryophytes and pteridophytes, transport of male gametes requires: **[NEET-2016]**
- (1) Water (2) Wind
(3) Insects (4) Birds

Sol. Answer (1)

In several simple plants like algae, bryophytes and pteridophytes, water is the medium through which male gamete transfer takes place.

6. Which of the following pairs is **not** correctly matched? **[Re-AIPMT-2015]**

Mode of reproduction	Example
(1) Conidia	<i>Penicillium</i>
(2) Offset	Water hyacinth
(3) Rhizome	Banana
(4) Binary fission	<i>Sargassum</i>

Sol. Answer (4)

Mode of reproduction	Example
(1) Conidia	<i>Penicillium</i> (Ascomycetes)
(2) Offset	Water hyacinth
(3) Rhizome	Banana
(4) Binary fission	<i>Saecharomyces</i> (Yeast)

7. In ginger vegetative propagation occurs through **[AIPMT-2015]**
- (1) Runners (2) Rhizome
(3) Offsets (4) Bulbils

Sol. Answer (2)

In ginger, vegetative propagation occurs through rhizome.

8. Which one of the following is wrong about *Chara*? **[AIPMT-2014]**
- (1) Upper oogonium and lower round antheridium
(2) Globule and nucule present on the same plant
(3) Upper antheridium and lower oogonium
(4) Globule is male reproductive structure

Sol. Answer (3)

Nucule → ♀ → Upper

Globule → ♂ → Lower

9. Isogamous condition with non-flagellated gametes is found in **[NEET-2013]**
- (1) *Spirogyra* (2) *Volvox* (3) *Fucus* (4) *Chlamydomonas*

Sol. Answer (1)

10. Product of sexual reproduction generally generates:

[NEET-2013]

- (1) Prolonged dormancy
- (2) New genetic combination leading to variation
- (3) Large biomass
- (4) Longer viability of seeds

Sol. Answer (2)

11. Which one of the following is **correctly** matched?

[AIPMT (Prelims)-2012]

- (1) *Chlamydomonas* – Conidia
- (2) Yeast – Zoospores
- (3) Onion – Bulb
- (4) Ginger – Sucker

Sol. Answer (3)

Tunicate bulb

Questions asked Prior to Medical Ent. Exams. 2005

12. Select the **wrong** statement:

- (1) Anisogametes differ either in structure, function or behaviour
- (2) In Oomycetes female gamete is smaller and motile, while male gamete is larger and non- motile
- (3) *Chlamydomonas* exhibits both isogamy and anisogamy and *Fucus* shows oogamy
- (4) Isogametes are similar in structure, function and behaviour

Sol. Answer (2)

Female gamete large in size and less in number.

Male gamete small in size and large in number.

13. Monoecious plant of *Chara* shows occurrence of

- (1) Stamen and carpel on the same plant
- (2) Upper antheridium and lower oogonium on the same plant
- (3) Upper oogonium and lower antheridium on the same plant
- (4) Antheridiophore and archegoniophore on the same plant

Sol. Answer (3)

♀ Nucule

♂ Globule

14. Which one of the following is common to multicellular fungi, filamentous algae and protonema of mosses?

- (1) Mode of Nutrition
- (2) Multiplication by fragmentation
- (3) Diplontic life cycle
- (4) Members of kingdom Plantae

Sol. Answer (2)

15. The "Eyes" of the potato tuber are

- (1) Axillary buds
- (2) Root buds
- (3) Flower buds
- (4) Shoot buds

Sol. Answer (1)

Present in Axile of leaf.

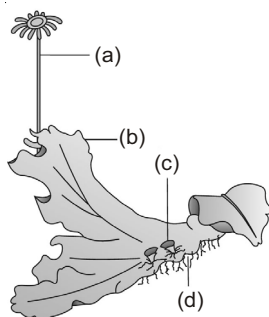
16. Which one of the following pairs is **wrongly** matched while the remaining three are correct?

- (1) *Bryophyllum* – Leaf buds
- (2) *Agave* – Bulbils
- (3) *Penicillium* – Conidia
- (4) Water hyacinth – Runner

Sol. Answer (4)

Water hyacinth → Offsets

17. Examine the figure given below and select the right option giving all the four parts (a, b, c, d) correctly identified



(a)	(b)	(c)	(d)
(1) Seta	Sporophyte	Protonema	Rhizoids
(2) Antheridiophore	Male thallus	Globule	Roots
(3) Archegoniophore	Female thallus	Gemmacup	Rhizoids
(4) Archegoniophore	Female thallus	Bud	Foot

Sol. Answer (3)

18. Which of the following propagates through leaf-tip?

- (1) Walking fern (2) Sprout-leaf plant (3) *Marchantia* (4) Moss

Sol. Answer (1)

Adiantum caudatum – Walking fern

19. In oogamy, fertilization involves

- (1) A small non-motile female gamete and a large motile male gamete
 (2) A large non-motile female gamete and a small motile male gamete
 (3) A large non-motile female gamete and a small non-motile male gamete
 (4) A large motile female gamete and a small non-motile male gamete

Sol. Answer (2)

20. In which one of the following pair both the plants can be vegetatively propagated by leaf buds?

- (1) *Agave* and *Kalanchoe* (2) *Bryophyllum* and *Kalanchoe*
 (3) *Asparagus* and *Bryophyllum* (4) *Chrysanthemum* and *Agave*

Sol. Answer (2)

21. Why is vivipary an undesirable character for annual crop plants?

- (1) It reduces the vigour of the plant
 (2) It adversely affects the fertility of the plant
 (3) The seeds exhibit long dormancy
 (4) The seeds cannot be stored under normal conditions for the next season

Sol. Answer (4)

Vivipary → Germination of seed on plants

So they cannot be stored for a long time

22. Vegetative propagation in mint occurs by

- (1) Sucker (2) Runner (3) Offset (4) Rhizome

Sol. Answer (1)

Mint - Suckers

23. Which one of the following plants is monoecious?

- (1) Papaya (2) *Marchantia* (3) *Pinus* (4) *Cycas*

Sol. Answer (3)

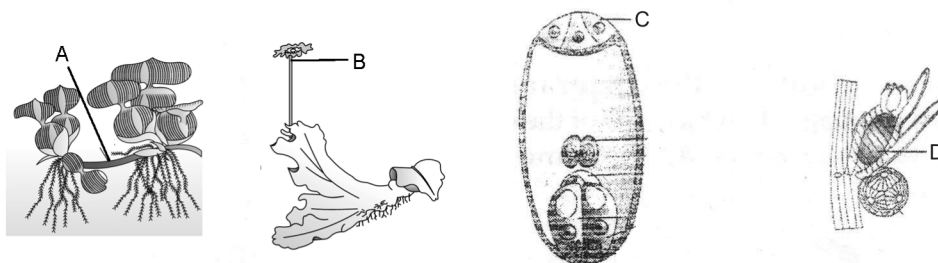
24. Which one of the following is a polygamous plant?

- (1) Maize (2) Coconut (3) Litchi (4) Papaya

Sol. Answer (3)

25. Examine the figures (A-D) given below and select the right option out of 1-4, in which all the four structures A, B, C and D are identified correctly

Structures :



Options :

	A	B	C	D
(1)	Rhizome	Sporangiophore	Polar cell	Globule
(2)	Runner	Archegoniophore	Synergid	Antheridium
(3)	Offset	Antheridiophore	Antipodals	Oogonium
(4)	Sucker	Seta	Megaspore mother cell	Gemma cup

Sol. Answer (3)

26. Vegetative propagation in *Pistia* occurs by

- (1) Stolen (2) Offset
(3) Runner (4) Sucker

Sol. Answer (2)

Pistia – Offsets

27. Syngamy can occur outside the body of the organism in

- (1) Fungi (2) Mosses
(3) Algae (4) Ferns

Sol. Answer (3)

Algae – External fertilisation

SECTION - C

Assertion-Reason Type Questions

1. A : At the end of juvenility, the organism develops the capacity to reproduce.
R : It represents the time period between the first and next flowering in plants.
Sol. Answer (3)
2. A : Reproduction is a biological process of giving rise to young ones.
R : Reproduction increases population and maintains the continuity of species.
Sol. Answer (2)
3. A : Endogamy is common in majority of animals.
R : Fusing gametes are quite different and develop from the different individuals.
Sol. Answer (4)
4. A : The higher organisms must evolve a special mechanism for gamete transfer.
R : Male and female gametes are formed in different individuals.
Sol. Answer (1)
They are dioecious
5. A : Air layering does not produce a composite plant.
R : Stock and scion are fused to form a composite plant during grafting.
Sol. Answer (2)
6. A : Most of the species of *Chara* are monoecious but show cross fertilization.
R : The plant body shows protandrous condition.
Sol. Answer (1)
Protandrous → Male part develops earlier than female part
7. A : Multiplication occurs rapidly with equal rate in apomixis as well as in amphimixis.
R : Both types show mitotic as well as meiotic division.
Sol. Answer (4)
Apomixis show only mitotic division
8. A : *Fucus*, a brown alga shows oogamy.
R : Female gamete is quite large as compare to male gamete.
Sol. Answer (1)
9. A : Runner, tuber, sucker, offset etc. are vegetative propagules.
R : Two parents are involved in the formation of these structure.
Sol. Answer (3)
Tuber, Runner, Suckers are vegetative propagule so it uniparental.
10. A : Cereals are monocarpic plants.
R : They have distinct juvenile, reproductive and senescent phases.
Sol. Answer (2)
Monocarpic → Flower only once in lifetime

11. A : The number of male gametes produced is several times than the number of female gametes produced.

R : This compensates the loss of male gametes during movement.

Sol. Answer (1)

12. A : In *Volvox*, heterogametes are formed in sexual life cycle.

R : Non-motile ♂ gametes are transferred by water.

Sol. Answer (3)

Male gametes will swim by flagella and join with female gamete.

13. A : Zygote is the first cell of the new generation in all sexually reproducing organisms.

R : Cell division and cell differentiation are the stages of embryogenesis.

Sol. Answer (2)

14. A : Water hyacinth is one of the most invasive weed.

R : It increases the dissolved oxygen of water.

Sol. Answer (3)

It is also called terror of Bengal.

15. A : No individual is immortal except one celled organisms.

R : A few number of plants and animals species have existed on earth and do not die because of budding.

Sol. Answer (3)

