



INDIAN SCHOOL AL WADI AL KABIR



Class: X	DEPARTMENT OF SCIENCE -2026-27 SUBJECT: BIOLOGY	DATE: 06/09/2026
WORKSHEET NO:4 WITH ANSWERS	CHAPTER: HOW DO ORGANISMS REPRODUCE? – PART I (ASEXUAL REPRODUCTION)	A4 FILE FORMAT
CLASS & SEC:	NAME OF THE STUDENT:	ROLL NO.

I. OBJECTIVE TYPE QUESTIONS

Ia. Multiple-choice questions:

- During binary fission in Amoeba, the correct sequence is:
 - cytoplasm divides first, then nucleus
 - nucleus divides first, followed by division of cytoplasm
 - cell wall forms first, followed by nuclear division
 - two nuclei fuse and then the cell divides
- Leishmania differs from Amoeba in binary fission because Leishmania:
 - forms spores before division
 - divides only during unfavourable conditions
 - divides in a definite plane related to its elongated body
 - produces buds before the cell divides
- A malarial parasite increases its number within a host cell by:
 - multiple fission
 - fragmentation
 - budding
 - regeneration
- Fragmentation in Spirogyra can result in new individuals because each fragment:
 - contains a sporangium
 - develops roots before growth
 - forms gametes immediately
 - can grow into a complete filament
- In yeast, a small outgrowth that develops into a new individual is called a:
 - spore
 - bud
 - fragment
 - hypha
- A mature bud of Hydra generally becomes a separate individual when it:
 - forms a spore

- b) undergoes multiple fission
- c) detaches from the parent
- d) loses its nucleus

7. The vegetative propagation of Bryophyllum is mainly associated with:

- a) adventitious buds on leaf margins
- b) roots growing from flowers
- c) seeds present inside the leaves
- d) buds formed only on the stem tip

8. The 'eyes' of a potato are important in vegetative propagation because they are:

- a) spore cases
- b) root hairs
- c) flowers
- d) buds

9. One important advantage of vegetative propagation is that it:

- a) always produces genetically different plants
- b) can rapidly multiply plants having desired characteristics
- c) requires fusion of male and female gametes
- d) can occur only in plants with viable seeds

10. Asexual reproduction usually produces offspring with greater similarity because:

- a) two parents contribute genes
- b) gametes fuse randomly
- c) a single parent gives rise to the offspring without gamete fusion
- d) the offspring always undergo mutation

Ib. Assertion and Reason:

For questions 11 to 12, two statements are given—one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the options (i), (ii), (iii) and (iv) as given below:

- (i) Both A and R are true, and R is the correct explanation of the assertion.**
- (ii) Both A and R are true, but R is not the correct explanation of the assertion.**
- (iii) A is true but R is false.**
- (iv) A is false but R is true.**

11. **Assertion (A):** In asexual reproduction, offspring generally show greater similarity to the parent.

Reason (R): Only one parent is normally involved, and there is no fusion of gametes.

12. **Assertion (A):** Vegetative propagation is useful for multiplying plants that do not produce viable seeds.

Reason (R): New plants cannot arise directly from vegetative parts such as roots, stems or leaves.

13. **Assertion (A):** Spore formation is an effective method of reproduction in Rhizopus.

Reason (R): The spores can remain dormant and are protected by thick walls until favourable conditions return.

14. **Assertion (A):** Asexual reproduction can introduce small variations in a population.

Reason (R): DNA copying is always perfectly accurate, so minor differences may arise.

II. VERY SHORT ANSWER TYPE QUESTIONS (2 Marks)

15. What is meant by regeneration in the context of reproduction?
16. Name two organisms from the chapter that reproduce by budding.
17. Why is fragmentation possible in Spirogyra but not in all multicellular organisms?
18. What is vegetative propagation? Name any three vegetative parts of a plant that can be used for vegetative propagation.
19. Why are plants produced by vegetative propagation generally similar to the parent plant?
20. State the conditions necessary for the germination of Rhizopus spores.
21. Why can spores help an organism survive for a long period under unfavourable conditions?

III. SHORT ANSWER TYPE QUESTIONS (3 Marks)

22. Differentiate between binary fission and multiple fission on the basis of (i) number of daughter cells formed and (ii) examples. Also name one organism showing each type.
23. Explain vegetative propagation with the help of one suitable example each involving a stem and a leaf.
24. Describe the sequence of events during budding in Hydra. Why is the bud considered a new individual after it separates from the parent?

IV. LONG ANSWER TYPE QUESTIONS (5 Marks)

25. Explain asexual reproduction and describe fragmentation in Spirogyra. Why does fragmentation result in new organisms?
26. Explain vegetative propagation under the following headings: (i) meaning, (ii) natural examples, (iii) two advantages, and (iv) one limitation.
27. With the help of a diagram, explain regeneration in Planaria. Why is regeneration considered an asexual mode of reproduction, and why is it not regarded as the usual reproductive method for most organisms?
28. Describe spore formation in Rhizopus with a neat, labelled diagram. Include the role of sporangium and the fate of spores after their release.
29. Compare budding, fragmentation and spore formation as asexual modes of reproduction. Give one organism/example for each and state one distinguishing feature of each.

V. a. PASSAGE BASED QUESTIONS:

A student placed a moist piece of bread in a warm place for several days. A cotton-like growth appeared first, followed by tiny dark spherical structures. When the bread was kept dry, the growth was not observed. Answer the following:

30. What organism is most likely responsible for the growth?
31. Name the spherical reproductive structures observed on the bread.
32. Why does keeping the bread dry prevent the multiplication of this organism?

V. b. PASSAGE BASED QUESTIONS:

A gardener wants to multiply a plant that has desirable characteristics but produces few viable seeds. He uses a vegetative part of the parent plant to raise new plants. The new plants grow and mature faster than plants raised from seeds.

33. What mode of reproduction is being used by the gardener?
 34. Why are the new plants expected to resemble the parent plant closely?
 35. State two advantages of this method of propagation.

VI. BOARD BASED QUESTIONS (2025 -2026).

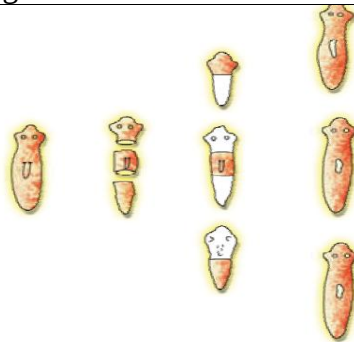
36. Spirogyra, despite being a multi-cellular organism, still shows a simple reproductive method. Select the correct option with regard to reproduction in Spirogyra: (1)

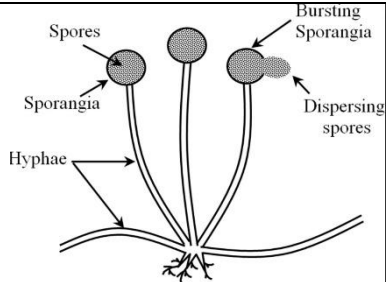
- (A) Asexual reproduction by division of cells into two cells
 (B) Sexual reproduction by division of cells into many cells
 (C) Asexual reproduction by breaking up of Spirogyra filaments into smaller parts
 (D) Sexual reproduction by the formation of gametes after meiosis of cells of filaments followed by fusion of male and female gametes

37. "Variation is useful for the survival of species over time." Explain this statement with the help of an example. (2)

ANSWERS

	Ia. Multiple choice questions
1	(b) nucleus divides first, followed by division of cytoplasm
2	(c) divides in a definite plane related to its elongated body
3	(a) multiple fission
4	(d) can grow into a complete filament
5	(b) bud
6	(c) detaches from the parent
7	(a) adventitious buds on leaf margins
8	(d) buds
9	(b) can rapidly multiply plants having desired characteristics
10	(c) a single parent gives rise to the offspring without gamete fusion
	Ib. Assertion and Reason
11	(i) Both A and R are true and R is the correct explanation of the assertion.
12	(iii) A is true but R is false.
13	(i) Both A and R are true and R is the correct explanation of the assertion.
14	(iii) A is true but R is false.
	II. VERY SHORT ANSWERS TYPE QUESTIONS (2 Mark)
15	The process by which an organism or its body part forms a complete organism by developing the missing structures is called regeneration.
16	Yeast and Hydra.
17	Each Spirogyra fragment can grow into a complete filament, whereas such simple body fragmentation does not generally allow every multicellular organism to form a complete individual.
18	Root, stem and leaf.

19	They arise from vegetative parts without fusion of gametes and therefore retain essentially the same genetic makeup as the parent, apart from small copying errors.
20	Right amount of Moisture, nutrition and favourable temperature are necessary for the spores to germinate and begin growth.
21	The spores have protective thick walls and can remain dormant until favourable conditions are available.
	III. SHORT ANSWER TYPE QUESTIONS (3 Marks)
22	Binary fission produces two daughter cells from one parent cell; examples include Amoeba and Leishmania. Multiple fission produces many daughter cells from one parent cell; Plasmodium is an example.
23	Vegetative propagation is asexual reproduction in which new plants arise from vegetative parts such as roots, stems or leaves. Stem example: potato through its eyes/buds. Leaf example: Bryophyllum through adventitious buds on leaf margins.
24	In Hydra, repeated cell division at one specific site produces a small outgrowth or bud. The bud enlarges and develops structures of a tiny Hydra. When mature, it detaches from the parent and lives independently, so it functions as a new individual.
	IV. LONG ANSWER TYPE QUESTIONS (5 Marks)
25	Fragmentation is an asexual mode in which the body or filament breaks into smaller pieces and each suitable piece develops into a new organism. In Spirogyra, the filament breaks into fragments, and each fragment grows into a complete filament. No gamete fusion is involved and only one parent contributes to the process.
26	Vegetative propagation is the formation of new plants from vegetative parts such as roots, stems or leaves. Natural examples include potato from stem buds/eyes and Bryophyllum from leaf-margin buds. Advantages include rapid multiplication and production of plants closely resembling the parent; it is also useful for plants with few or non-viable seeds. A limitation is that limited variation may make a population less adaptable to sudden environmental changes.
27	 <i>Regeneration in Planaria</i> Planaria has specialised cells that can divide and form the missing tissues. When the body is cut, the pieces can regenerate the missing parts and may form complete organisms. It is asexual because one parent is involved and there is no gamete fusion. It is not the usual reproductive method for most organisms because most organisms do not normally depend on being cut into pieces to reproduce.

28	In Rhizopus, reproductive spores are formed inside a sporangium borne on a specialised hypha. As the sporangium matures, numerous spores are formed and later released. The spores can be carried by air or other agents. Their protective walls help them remain dormant during unfavourable conditions; when they reach a suitable moist surface, they germinate and grow.	 The diagram illustrates the reproductive structure of Rhizopus. It shows several hyphae growing from a common base. At the tips of some hyphae are spherical sporangia. One sporangium is shown bursting, releasing small, round spores into the air. Labels with arrows point to 'Spores', 'Sporangia', 'Hyphae', 'Bursting Sporangia', and 'Dispersing spores'.
29	Budding: a small outgrowth develops on the parent and later separates, as in Hydra or yeast. Fragmentation: a filament/body breaks into pieces and each suitable piece grows into a new organism, as in Spirogyra. Spore formation: spores are produced in a reproductive structure and later germinate under favourable conditions, as in Rhizopus.	
	V. a. PASSAGE BASED QUESTIONS:	
	Rhizopus (bread mould).	
	Spores.	
	Rhizopus needs moisture for spore germination and growth; a dry surface does not provide the required moisture.	
:	V b. PASSAGE BASED QUESTIONS:	
	Vegetative propagation.	
	The new plants arise from vegetative cells of the parent without fusion of gametes, so they are generally genetically similar to the parent.	
	Any two: rapid multiplication; plants can mature/flower earlier; desirable parental characters are retained; plants that do not produce viable seeds can be multiplied.	
	VI. BOARD BASED QUESTIONS	
36	C) / Asexual reproduction by breaking up of Spirogyra filaments into smaller parts.	
37	Variation provides chance for species to survive under unfavourable / changing environmental conditions. e.g. if there were a population of bacteria living in temperate waters and if water temperature increased by global warming, most of these bacteria would die but the few variants resistant to heat would survive and grow further.	

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