	INDIAN SCHOOL AL WADI AL KABIR	
Class: IX	**DEPARTMENT OF SCIENCE -2026-27** **SUBJECT: BIOLOGY**	**DATE: 14/11/2026**
WORKSHEET NO. 5 WITH ANSWERS	**TOPIC: REPRODUCTION: HOW LIFE CONTINUES- PART 1**	**A4 FILE FORMAT**
CLASS & SEC:	**NAME OF THE STUDENT:**	**ROLL NO.**

I. OBJECTIVE TYPE QUESTIONS 1(Mark)

1. Which of the following best describes reproduction?
a) The process by which organisms obtain food
b) The biological process by which organisms produce individuals of their own kind
c) The process of removal of waste materials
d) The process of growth and development only
2. Which of the following plants reproduces through plantlets arising from its leaves?
a) Mango
b) Ginger
c) Bryophyllum
d) Rose
3. The new plants produced through vegetative propagation are generally:
a) Genetically different from the parent
b) Genetically identical to the parent
c) Unable to grow independently
d) Produced only through seeds
4. In the technique of grafting, the stem piece inserted into the rooted plant is obtained from:
a) The same root system only
b) Another plant of a different variety
c) A seed
d) A leaf of the rooted plant
5. Which of the following organisms reproduces through budding?
a) Rhizopus
b) Aspergillus
c) Hydra
d) Mango
6. Which of the following is an important application of fungi mentioned in the textbook?
a) Production of plastics
b) Production of antibiotics
c) Production of fertilised seeds
d) Formation of plant grafts

ASSERTION AND REASONING

For each question, select the correct option:
(a) Both Assertion and Reason are true, and Reason is the correct explanation of Assertion.

(b) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
(c) Assertion is true, but Reason is false.
(d) Assertion is false, but Reason is true.

7. **Assertion:** Vegetative propagation is useful for producing genetically identical plants.
   Reason: It involves only one parent in the formation of new plants.
8. **Assertion:** Budding in Hydra involves the formation of a small outgrowth on the parent body.
   Reason: Repeated cell division at a specific site produces a bud that eventually separates from the parent.
9. **Assertion:** Fungi play an important role in the decomposition of organic wastes and pollutants.
   Reason: Fungi reproduce rapidly through spore formation.
10. **Assertion:** In layering, the buried portion of a twig develops roots before being separated from the parent plant.
    Reason: The twig is cut away from the parent plant before roots develop.

II. SHORT ANSWER QUESTIONS (2 Marks)

11. State two advantages of vegetative propagation in agriculture and horticulture.
12. What is the role of the cotton cloth or wrapping film used during grafting?
13. Why is a flexible and thin twig selected for the technique of layering? Mention the approximate time required for root development.
14. Why did Louis Pasteur's experiments become important in understanding the origin of life and disease prevention?
15. What is meant by vegetative propagation? Give two examples of plants that reproduce through this method.

III. SHORT ANSWER QUESTIONS (3 Marks)

16. Explain the technique of cutting as a method of vegetative propagation. Mention the important steps involved in preparing and planting a stem cutting.
17. Describe the process of grafting. Explain how two different plant varieties can be combined using this technique.
18. Differentiate between budding in yeast and budding in Hydra based on the organism involved and the process of bud formation.
19. Describe the structure of Rhizopus as observed under a microscope. Mention the functions of hyphae, spore-containing sacs and spores.
20. Explain the importance of tissue culture in banana farming. How does this technique help farmers obtain healthy plantlets and improve crop production?

IV. CASE STUDY BASED QUESTIONS (4 Marks)

Read the following passages carefully and answer the questions that follow.

21. A farmer wants to grow a large number of rose plants with desirable characteristics. He selects a healthy rooted rose plant and takes a stem piece from another rose variety. He makes a slit in the rooted plant and inserts the stem piece into it. The graft is protected until the wound heals.

Answer the following:

a) Identify the method of vegetative propagation used by the farmer.
b) What are the two plant parts involved in this technique?
c) Why is the graft protected using a cloth or wrapping film?
d) State one advantage of this technique for horticulture.

22. A student observes a prepared yeast slide under a compound microscope. Small, round outgrowths are visible on some yeast cells. In another observation, the student notices small

outgrowths on the body of Hydra. These outgrowths gradually increase in size and eventually separate from the parent organism.
Answer the following:
a) Name the reproductive method observed in both organisms.
b) What are the small outgrowths called?
c) Which process of cell division is central to asexual reproduction in these organisms?
d) What happens to the outgrowth formed on Hydra after it develops?

V. LONG ANSWER QUESTIONS (5 Marks)

23. What is asexual reproduction? Explain the concept of vegetative propagation with suitable examples from the textbook. Also describe how the method helps in producing desirable varieties of plants on a large scale.
24. Explain the process of grafting with the help of a neat, labelled diagram. Describe the sequence of steps involved, beginning with the selection of the two plants and ending with the growth of the grafted plant.
25. Mitosis plays a central role in asexual reproduction. Explain how mitosis contributes to the production of genetically identical offspring. Why are such offspring called clones? Discuss how this mode of reproduction helps organisms increase their population rapidly.

ANSWER KEY

S. No.	**ANSWERS**
I	**OBJECTIVE TYPE QUESTIONS- 1 Mark**
1.	b) Biological process by which organisms produce individuals of their own kind
2.	c) Bryophyllum
3.	b) Genetically identical to the parent
4.	b) Another plant of a different variety
5.	c) Hydra
6.	b) Production of antibiotics
	ASSERTION AND REASONING
7.	(a) Both Assertion and Reason are true. Vegetative propagation involves a single parent plant. The new plants develop from the parent's vegetative parts and are genetically identical to it.
8.	(a) Both statements are true. In Hydra, repeated cell division at a particular location produces a small outgrowth called a bud. The bud grows and eventually separates from the parent to form a new individual.
9.	(b) Both statements are true, but the Reason does not explain the Assertion. Fungi help decompose organic matter and can be used in environmental management. Spore formation is a method of reproduction, not the direct reason for their decomposition ability.
10.	(c) The Assertion is true, but the Reason is false. In layering, the twig is allowed to develop roots while it is still attached to the parent plant. It is separated only after roots have developed.
II.	**SHORT ANSWER QUESTIONS (2 Marks)**
11.	1. It helps produce large numbers of plants with desirable characteristics, identical to those of the parent plant. 2. Cutting, grafting, layering, and tissue culture efficiently propagate plants, and they let farmers cultivate desirable crops on a large scale. Tissue culture also eliminates virus-infected plants.

<table>
<tr><td>12.</td><td>The wrapping material holds the scion (the part of the plant to be grafted) and stock (the rooted plant) firmly together and protects the joint. It helps prevent the joined surfaces from drying out while they heal and establish a connection. The wrapping film or cotton cloth protects the slit to avoid pests entering the graft until it heals</td></tr>
<tr><td>13.</td><td>A flexible twig can be bent towards the soil without breaking. A portion of it is buried in moist soil while remaining attached to the parent plant. Roots develop from the buried portion (Roots develop after 10-15 days) after which it can be separated.</td></tr>
<tr><td>14.</td><td>Pasteur proved that new life always comes from pre-existing life. He established the germ theory of disease, strengthened the cell theory (all cells arise from pre-existing cells) and led to sterilisation of food and instruments.</td></tr>
<tr><td>15.</td><td>Vegetative propagation is a type of asexual reproduction in plants in which new plants develop from vegetative parts such as roots, stems or leaves of the parent plant, without the formation of seeds.
Examples:
1. Bryophyllum – through plantlets arising from leaf margins.
2. potato, ginger, money plant, sugarcane - Stem</td></tr>
<tr><td>III.</td><td>SHORT ANSWER QUESTIONS (3 Marks)</td></tr>
<tr><td>16.</td><td>Cutting is a method of vegetative propagation in which a piece of stem from a healthy parent plant is used to develop a new plant.
Steps involved:
1. Collect cuttings in the morning, remove leaves from the lower half, insert about half the length in soil mixed with compost at 45-60°, and water regularly.
2. The new plant generally retains the characteristics of the parent plant.</td></tr>
<tr><td>17.</td><td>Grafting is a technique of vegetative propagation in which parts of two plants are joined to grow as a single plant.
1. The rooted plant that provides the root system is called the stock.
2. A stem piece from the desired variety is called the scion.
3. The scion is inserted into a suitable cut or slit in the stock, and the joint is wrapped securely.
After the two parts unite, the plant grows with the desirable characteristics of the scion and the established root system of the stock.</td></tr>
<tr><td>18.</td><td>Budding in yeast and budding in Hydra
<table>
<tr><td>Budding in yeast</td><td>Budding in Hydra</td></tr>
<tr><td>Yeast is a unicellular fungus.</td><td>Hydra is a multicellular organism.</td></tr>
<tr><td>A small outgrowth develops on the parent cell.</td><td>A small outgrowth develops on the body wall.</td></tr>
<tr><td>The bud grows and separates to form a new yeast cell.</td><td>The bud develops into a young Hydra and separates from the parent.</td></tr>
</table>
Both are examples of asexual reproduction.</td></tr>
<tr><td>19.</td><td>Rhizopus, commonly called bread mould, has a network of thread-like structures called hyphae.
Its main structures include:
1. Hyphae: Thread-like structures that form the body of the fungus and absorb nutrients.
2. Sporangia: Round structures present at the tips of specialised hyphae that contain spores.</td></tr>
</table>

	3. Spores: Reproductive units that can germinate under favourable conditions to form new fungal growth.
20.	Tissue culture is a method of vegetative propagation in which a small piece of plant tissue is grown under sterile conditions in a nutrient medium. 1. A small piece of tissue, such as a shoot tip, is taken from a healthy parent plant. 2. It is grown in a sterile nutrient medium, where cells multiply and develop into plantlets. 3. A large number of healthy, genetically similar banana plants can be produced in a relatively short time. Tissue culture uses the shoot tip (apical meristem) and gives mass-produced healthy plantlets. It eliminates virus-infected plants and ensures high yields
IV.	**CASE STUDY BASED QUESTIONS (4 Marks)**
21.	a) Grafting.
	b) • Stock – the rooted plant. • Scion – the stem piece obtained from the desired plant variety.
	c) It holds the scion and stock firmly together, protects the joint and prevents it from drying while the tissues unite. The wrapping film or cotton cloth protects the slit to avoid pests entering the graft until it heals.
	d) It combines desirable characteristics of two plants, such as a well-established root system and desirable fruit-producing characteristics.
22.	a) Budding.
	b) Buds.
	c) Mitosis.
	d) The bud grows into a young Hydra and eventually separates from the parent to live independently.
V.	**LONG ANSWER QUESTIONS (5 Marks)**
23.	Asexual reproduction is a type of reproduction in which a new individual develops from a single parent without the fusion of gametes. The offspring produced are generally genetically identical to the parent and are called clones. Vegetative propagation is a type of asexual reproduction in plants in which new plants develop from vegetative parts such as roots, stems or leaves. Examples include: 1. Turmeric – new plants develop from underground rhizomes. 2. Onion – new plants develop from bulbs. 3. Bryophyllum – plantlets develop from the margins of leaves. 4. Rose – new plants can be developed through stem cuttings. Importance in agriculture and horticulture: • It helps produce large numbers of plants with desirable characteristics. • The new plants retain the qualities of the parent plant. • It is useful for plants that produce few or no viable seeds, such as cultivated bananas. • It allows growers to multiply proven varieties without depending on seed production. Thus, vegetative propagation is an important technique for commercial plant production.
24.	Grafting is a method of vegetative propagation in which parts of two different plants are joined together so that they grow as one plant. The two parts involved are:

	1. Stock: The rooted plant that provides the root system. 2. Scion: The stem piece obtained from the plant variety whose desirable characteristics are required. Steps involved: 1. Select a healthy rooted plant to be used as the stock. 2. Select a healthy stem piece from the desired plant variety to be used as the scion. 3. Make a suitable cut or slit in the stock. 4. Insert the scion into the cut so that the two parts fit together. 5. Tie and protect the joint using wrapping material. 6. Allow the tissues to unite and grow as a single plant. Grafting helps combine the desirable characteristics of two plants. It is commonly used in horticulture for plants such as mango, guava and rose.
25.	Mitosis is a type of cell division in which one parent cell divides to produce two genetically identical daughter cells, usually having the same chromosome number as the parent cell. Role of mitosis in asexual reproduction: 1. A single parent organism produces new individuals without the fusion of gametes. 2. The parent cells undergo repeated mitotic divisions. 3. The newly formed cells grow and develop into new individuals. 4. Since the genetic material is copied and distributed during mitosis, the offspring are generally genetically identical to the parent. 5. Such genetically identical individuals are called clones. Importance of asexual reproduction: • It requires only one parent. • It allows organisms to reproduce rapidly under favourable conditions. • It helps produce a large number of offspring in a relatively short time. • It preserves desirable characteristics across generations. Examples include budding in yeast and Hydra and vegetative propagation in plants. Therefore, mitosis is essential for producing genetically similar offspring through asexual reproduction.

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