

PRACTICE PAPER 01 (2026-27)
CHAPTER 07: HOW DO ORGANISMS REPRODUCE?
(STEP-BY-STEP SOLUTIONS)

SUBJECT: SCIENCE

MAX. MARKS : 40

CLASS : X

DURATION : 1½ hrs

General Instructions:

- (i) All questions are compulsory.
- (ii) This question paper contains **20** questions divided into five Sections A, B, C, D and E.
- (iii) **Section A** comprises 10 MCQs and Assertion-Reason questions of **1 mark** each. **Section B** comprises 4 Very Short Answer questions of **2 marks** each. **Section C** comprises 3 Short Answer questions of **3 marks** each. **Section D** comprises 1 Long Answer question of **5 marks**. **Section E** comprises 2 Case Study Based questions of **4 marks** each.
- (iv) There is no overall choice. Internal choice is provided in Section E.
- (v) Use of calculators is not permitted.

SECTION - A

Questions 1 to 10 carry 1 mark each.

1. The malarial parasite divides into many daughter cells simultaneously. This organism and its mode of reproduction are
- | | |
|-----------------------------------|---------------------------------|
| (a) Amoeba – binary fission | (b) Leishmania – binary fission |
| (c) Plasmodium – multiple fission | (d) Hydra – budding |

Solution:

Ans: (c) Plasmodium - multiple fission

2. Spirogyra, on maturation, breaks up into smaller pieces, each of which grows into a new individual. This is called
- | | |
|---------------------|----------------------|
| (a) budding | (b) fragmentation |
| (c) spore formation | (d) multiple fission |

Solution:

Ans: (b) fragmentation

- Spirogyra has a simple body organisation (no distinct tissues), so each fragment can grow into a new filament.

3. In bread mould (Rhizopus), the tiny 'blob-on-a-stick' structures that are involved in reproduction are
- | | |
|------------|---------------|
| (a) hyphae | (b) sporangia |
| (c) buds | (d) fragments |

Solution:

Ans: (b) sporangia

- Sporangia contain spores; the thread-like hyphae are not reproductive parts.

4. Buds produced in the notches along the leaf margin fall on the soil and develop into new plants in
- | | |
|------------|-----------------|
| (a) rose | (b) Bryophyllum |
| (c) banana | (d) sugarcane |

Solution:

Ans: (b) Bryophyllum

5. Which of the following plants bears unisexual flowers?

- (a) Hibiscus (b) Mustard
(c) Papaya (d) None of these

Solution:

Ans: (c) Papaya

- Papaya and watermelon have unisexual flowers; Hibiscus and mustard have bisexual flowers (both stamens and pistil).

6. In human beings, fertilisation normally takes place in the

- (a) uterus (b) ovary
(c) fallopian tube (oviduct) (d) vagina

Solution:

Ans: (c) fallopian tube (oviduct)

- Sperms travel upwards and meet the egg in the oviduct.

7. Which contraceptive method also helps to prevent the transmission of sexually transmitted diseases to some extent?

- (a) Copper-T (b) Oral pills
(c) Condom (d) Surgical blocking of fallopian tubes

Solution:

Ans: (c) Condom

- It is a mechanical barrier; the other methods prevent pregnancy but not transmission of infections.

8. After fertilisation in a flower, the ovule and the ovary respectively develop into

- (a) fruit and seed (b) seed and fruit
(c) embryo and seed (d) seed and embryo

Solution:

Ans: (b) seed and fruit

- The ovule develops a tough coat and becomes a seed; the ovary grows and ripens into a fruit.

In the following questions 9 and 10, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as:

- (a) Both (A) and (R) are true and (R) is the correct explanation of (A).
(b) Both (A) and (R) are true but (R) is not the correct explanation of (A).
(c) (A) is true but (R) is false.
(d) (A) is false but (R) is true.

9. **Assertion (A):** In human males, the testes are located outside the abdominal cavity in the scrotum.

Reason (R): Sperm formation requires a lower temperature than the normal body temperature.

Solution:

Ans: (a)

- Both are true and R explains why the testes lie in the scrotum.

10. **Assertion (A):** Variation is useful for the survival of a species over time.

Reason (R): The process of DNA copying during reproduction is absolutely accurate.

Solution:

Ans: (c)

- (A) is true – if a niche changes drastically, a few variants may survive. (R) is false – no biochemical reaction is absolutely reliable, so DNA copies show variations.

SECTION - B

Questions 11 to 14 carry 2 marks each.

- 11.** How does binary fission in Leishmania differ from that in Amoeba? How is multiple fission different from binary fission?

Solution:

In Amoeba, the cell can split into two in **any plane**. Leishmania has a whip-like structure at one end, so fission occurs in a **definite orientation** in relation to it. [1]

In binary fission one cell divides into **two** daughter cells; in multiple fission (e.g. Plasmodium) one cell divides into **many** daughter cells **simultaneously**. [1]

- 12.** (a) How does an organism like Rhizopus benefit from reproducing through spores?
(b) Why can complex organisms not give rise to new individuals through regeneration?

Solution:

(a) Spores are produced in large numbers in sporangia and are covered by **thick walls** that **protect them** until they reach a moist surface where they can begin to grow – helping the organism survive unfavourable conditions and spread. [1]

(b) In complex organisms, specialised cells are organised into tissues and organs placed at **definite positions**; most body parts lack the specialised cells needed to proliferate and develop into all cell types, so a piece cannot form a whole organism. [1]

- 13.** State two advantages of vegetative propagation. Name two plants grown commercially by this method.

Solution:

Advantages (any two) [$\frac{1}{2} + \frac{1}{2}$]:

- Plants bear **flowers and fruits earlier** than those grown from seeds.
- Plants that have **lost the capacity to produce seeds** (banana, orange, rose, jasmine) can be propagated.
- All new plants are **genetically similar** to the parent, so they keep its desirable characteristics.

Examples (any two): **sugarcane, roses, grapes** (by layering or grafting). [$\frac{1}{2} + \frac{1}{2}$]

- 14.** If each new generation were formed by combining the DNA of two individuals, every generation would have twice the DNA of the previous one. How do organisms solve this problem?

Solution:

Special lineages of cells in specialised organs produce **germ-cells (gametes)** that have **only half the number of chromosomes** and half the DNA of body cells, by a cell division called **meiosis**. [1]

When the germ-cells from two individuals fuse during fertilisation, the original number of chromosomes and DNA content is **re-established** in the new generation. [1]

SECTION - C

Questions 15 to 17 carry 3 marks each.

15. (a) Differentiate between pollination and fertilisation.
(b) Distinguish between self-pollination and cross-pollination. Name two agents of cross-pollination.
(c) How does the male germ-cell reach the female germ-cell after pollination?

Solution:

(a) Pollination is the transfer of pollen grains from the anther (stamen) to the stigma. **Fertilisation** is the fusion of the male germ-cell with the female gamete (egg) in the ovule, forming a zygote. [1]

(b) Self-pollination: transfer within the **same flower**; cross-pollination: transfer from **one flower to another**. Agents: wind, water, animals (any two). [$\frac{1}{2} + \frac{1}{2}$]

(c) A **pollen tube** grows out of the pollen grain and travels through the **style** to reach the ovule in the ovary, carrying the male germ-cell. [1]

16. (a) State two functions of the testes.
(b) What is the role of the seminal vesicles and the prostate gland?
(c) Why is the urethra said to be a common passage?

Solution:

(a) (i) Formation of **sperms**. (ii) Secretion of the hormone **testosterone**, which regulates sperm formation and brings about changes in boys at puberty. [$\frac{1}{2} + \frac{1}{2}$]

(b) They add their **secretions** along the path of the vas deferens, so sperms are in a fluid that makes their **transport easier** and also provides **nutrition**. [1]

(c) The vas deferens unites with a tube from the urinary bladder, so the urethra carries **both sperms and urine**. [1]

17. (a) How does the uterus prepare itself every month?
(b) What happens if the egg is not fertilised? Name this process and state how long it usually lasts.
(c) How long does an unfertilised egg live?

Solution:

(a) Its lining becomes **thick and spongy** and is richly supplied with blood, to receive and nourish an embryo. [1]

(b) The thick lining is not needed, so it **slowly breaks** and comes out through the vagina as **blood and mucus**. This is **menstruation**; it occurs roughly every month and lasts about **2 to 8 days**. [$1\frac{1}{2}$]

(c) About **one day**. [$\frac{1}{2}$]

SECTION - D

Question 18 carries 5 marks.

- 18.** (a) Why does sexual reproduction generate more variation than asexual reproduction? Explain with an example how variation helps a species survive.
(b) Trace the path of the egg from its release to the formation of an embryo in human females.
(c) What is the placenta? Describe its structure and functions.

Solution:

(a) Each individual carries **variations accumulated** over earlier generations in its DNA. Sexual reproduction **combines DNA from two different individuals**, creating new combinations of variants every time, so variation arises faster than through DNA-copying errors alone. [1]

Example: bacteria living in temperate water – if the water heats up due to global warming, most die but the few **heat-resistant variants survive** and grow, so the species continues. [1]

(b) Step 1: One egg is released every month by one ovary. Step 2: It is carried through the **oviduct (fallopian tube)**, where it may meet sperms and be **fertilised**. Step 3: The zygote divides to form a ball of cells, the **embryo**, which is **implanted in the lining of the uterus**, grows and develops organs to become a foetus. [1½]

(c) The placenta is a **disc-like special tissue embedded in the uterine wall**. It has **villi** on the embryo's side and **blood spaces** on the mother's side surrounding the villi. [½ + ½]

Functions: provides a **large surface area** for glucose and oxygen to pass from mother to embryo; **wastes** from the embryo pass into the mother's blood through it. [½]

SECTION - E (Case Study Based Questions)

Questions 19 and 20 carry 4 marks each.

19. Study the diagram of the longitudinal section of a flower and answer the questions.

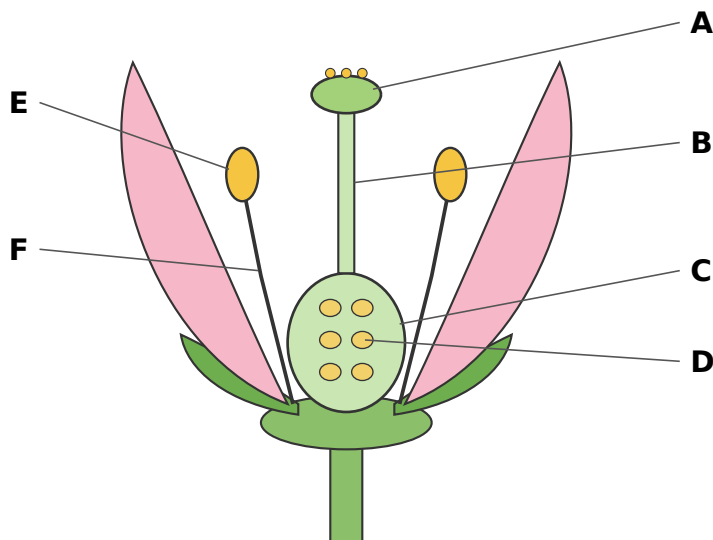


Figure: Longitudinal section of a flower

(a) Identify the parts labelled A and C. **(1)**

(b) Which labelled parts together make the male reproductive part? What does it produce? **(1)**

(c) Describe the events that take place after a pollen grain lands on part A until the seed and fruit are formed. **(2)**

OR

(c) Name the female reproductive part made up of A, B and C. Is this flower unisexual or bisexual? Give a reason, and name one plant with this type of flower. **(2)**

Solution:

(a) A = **stigma**; C = **ovary**. [$\frac{1}{2} + \frac{1}{2}$]

(b) E (**anther**) and F (**filament**) form the **stamen**; it produces **pollen grains**. [$\frac{1}{2} + \frac{1}{2}$]

(c) Step 1: A **pollen tube** grows out of the pollen grain and travels through the **style (B)** to the ovary. Step 2: The male germ-cell fuses with the egg in the **ovule (D)** - **fertilisation** - forming a **zygote**. [1]

Step 3: The zygote divides to form an **embryo**; the ovule develops a tough coat and becomes the **seed**. Step 4: The ovary grows and ripens into the **fruit**; petals, sepals, stamens, style and stigma may shrivel and fall off. [1]

OR

(c) A, B and C together form the **pistil** (female reproductive part). [$\frac{1}{2}$]

The flower is **bisexual** because it has **both stamens and pistil**. [1] Example: **Hibiscus / mustard**. [$\frac{1}{2}$]

20. Read the passage and answer the questions that follow.

Sexual maturation is a gradual process, and some maturation does not mean that the body or mind is ready for sexual acts or for bringing up children. The sexual act can transmit diseases and always carries the possibility of pregnancy, which makes major demands on a woman's body and mind. Many contraceptive methods have been devised: some create a mechanical barrier, some change the hormonal balance of the body, some devices are placed in the uterus, and surgical methods can block the vas deferens or fallopian tubes. Surgery is sometimes misused for illegal sex-selective abortion of female fetuses.

(a) Name two bacterial and two viral sexually transmitted diseases. **(1)**

(b) A woman uses a copper-T. Will it protect her from sexually transmitted diseases? Justify. **(1)**

(c) Explain how (i) oral pills and (ii) surgical blocking of the vas deferens prevent pregnancy. State one drawback of each. **(2)**

OR

(c) Why has prenatal sex determination been prohibited by law? Why must the female-male sex ratio be maintained? **(2)**

Solution:

(a) Bacterial: **gonorrhoea, syphilis**. Viral: **warts, HIV-AIDS**. [$\frac{1}{2} + \frac{1}{2}$]

(b) No. A copper-T is placed in the uterus only to prevent pregnancy; it does not act as a barrier between bodies, so it cannot prevent transmission of infections. [1]

(c) (i) **Oral pills** change the **hormonal balance** so that **eggs are not released** and fertilisation cannot occur. Drawback: they can cause **side-effects**. [1]

(ii) Blocking the **vas deferens** prevents **sperm transfer**, so fertilisation cannot occur. Drawback: surgery, if not done properly, can cause **infections and other problems**. [1]

OR

(c) Surgery for removal of pregnancies has been misused for **illegal sex-selective abortion of female fetuses**; prohibiting prenatal sex determination checks this misuse. [1]

For a **healthy society** the female-male ratio must be maintained; reckless female foeticide is causing the **child sex ratio to decline** at an alarming rate in some sections of society. [1]

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