

CLASS 9 SCIENCE

CHAPTER 11

REPRODUCTION: HOW LIFE CONTINUES

NCERT QUESTIONS & ANSWERS

Chapter coverage: Asexual and sexual reproduction; vegetative propagation; budding and spore formation; meiosis and variation; sexual reproduction in flowering plants; pollination; fertilisation and seed formation; reproduction in animals; human reproductive systems; gametogenesis; fertilisation; menstruation; pregnancy; reproductive maturity and prevention of unwanted pregnancy.

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CHAPTER-END QUESTIONS & ANSWERS

Revise • Reflect • Refine — Chapter 11

1. A flower's anthers are removed before it matures. Later, pollen from another plant of the same species is dusted onto its stigma and seeds are produced. Which process has been ensured here? (i) Self-pollination (ii) Cross-pollination (iii) Fertilisation (iv) Tissue culture.

Answer: (ii) Cross-pollination.

Pollen is transferred from a flower of one plant to the stigma of a flower on another plant of the same species. Removing the anthers prevents self-pollination before the desired pollen is applied.

2. Arrange the following stages of sexual reproduction in plants in the correct order: (i) Pollen germination on stigma (ii) Fertilisation (iii) Pollination (iv) Formation of zygote.

Answer: (iii), (i), (ii), (iv).

First, pollen is transferred to the stigma (pollination). The pollen then germinates and produces a pollen tube. Next, the male gamete fuses with the egg during fertilisation, producing a zygote.

3. Assertion (A): The zygote formed after fertilisation immediately attaches to the uterus wall. Reason (R): The uterus wall is always prepared to receive the zygote. Choose the correct statement.

Answer: (iv) A is false, but R is true.

The zygote does not immediately attach to the uterus wall. It undergoes mitotic divisions while travelling towards the uterus and then implants into the prepared inner lining. The uterus prepares its lining before implantation.

4. Why does asexual reproduction produce offspring that are genetically identical to the parent?

Answer: Asexual reproduction involves only one parent and does not involve the fusion of gametes from two individuals. The new individuals arise through cell division such as mitosis, which produces daughter cells with the same chromosome number and genetic information as the parent. Therefore, the offspring are genetically identical or nearly exact copies and are called **clones**.

Exam Tip: Use the exact terms from the chapter: asexual reproduction → clones; pollination → transfer of pollen from anther to stigma; fertilisation → fusion of gametes; zygote → fertilised egg; ovulation → release of a mature egg from an ovary.

5. Explain why the menstrual cycle stops during pregnancy.

Answer: During pregnancy, fertilisation has occurred and the zygote implants in the uterine lining. The uterine lining is maintained to support the developing embryo and foetus. Therefore, the lining is not shed as menstruation. Hence, the menstrual cycle does not continue normally during pregnancy.

6. Why are flowers that bloom at night white or light in colour as compared to flowers that bloom during the day?

Answer: White or light-coloured flowers are easier to see in low light. Their colour, often together with fragrance, helps attract nocturnal pollinators such as insects that are active at night. This increases the chances of pollination.

7. Why do vegetatively propagated plants tend to be more vulnerable to diseases than sexually reproduced plants?

Answer: Vegetative propagation produces genetically identical plants. Therefore, if a disease or pathogen can infect one plant, plants with the same genetic characteristics may also be similarly susceptible. Sexual reproduction produces genetic variation, which can make some individuals better able to resist particular diseases.

8. If all flowers in a type of plant were only capable of self-pollination, how would it affect genetic diversity over several generations? Explain.

Answer: Self-pollination would greatly reduce the mixing of genetic material between different plants. Although meiosis still creates some combinations, repeated self-pollination would generally maintain more similar genetic combinations and reduce variation compared with cross-pollination. Over generations, this could reduce genetic diversity and may make the population less adaptable to changing environments.

Exam Tip: Use the exact terms from the chapter: asexual reproduction → clones; pollination → transfer of pollen from anther to stigma; fertilisation → fusion of gametes; zygote → fertilised egg; ovulation → release of a mature egg from an ovary.

9. A farmer wants to produce a large number of genetically identical plants quickly. Suggest suitable reproduction methods and explain why they are effective.

Answer: Suitable methods include **cutting, grafting, layering and tissue culture**. These are forms of vegetative or asexual propagation. They use vegetative parts of plants and can rapidly produce many plants that retain the desirable characteristics of the parent. Tissue culture is especially useful for mass production of healthy plantlets.

10. Suresh prepares slides with pollen grains in different sugar concentrations (0%, 2.5%, 5%, 7.5%, 10%) to study pollen germination. (i) What are the different hypotheses which can be tested? (ii) What parameters should be kept the same?

(i) Hypotheses: Sugar concentration may affect pollen germination. One possible hypothesis is that pollen germination increases up to an optimum sugar concentration and then decreases at higher concentrations. Another testable hypothesis is that different concentrations produce different germination percentages or pollen-tube growth.

(ii) Variables to keep the same: Use pollen from the same plant/species and comparable pollen grains; keep the amount of pollen, slide volume,

temperature, time allowed for germination, observation method, and other solution conditions the same. The **independent variable** is sugar concentration; germination percentage/tube growth can be measured as dependent variables.

11. Look at the picture and identify which type(s) of pollination might have been followed in these flowers: Tomato — stamens cover the stigma; Wheat — flowers open after pollination; Papaya — male and female flowers are often borne on different papaya trees.

Answer:

Tomato: mainly **self-pollination** is likely because the stamens cover the stigma, allowing pollen to reach the stigma of the same flower.

Wheat: mainly **self-pollination** is indicated because the flowers open after pollination, so pollen transfer can occur before the flower opens.

Papaya: **cross-pollination** is indicated because male and female flowers are often borne on different plants, requiring pollen transfer between plants.

12. Apple orchards at Places A and B were compared. Place A used natural pollinators; Place B used beekeeping along with mixed farming. The graph shows fruit set of about 26% for natural pollination and 40% with bee colony, while fruit drop is about 35% for natural pollination and 8% with bee colony. (i) What hypotheses were tested? (ii) What were the parameters? (iii) Compare the two orchards for high yield. (iv) What can be inferred?

(i) Hypotheses: Introducing managed bee colonies may increase pollination efficiency and fruit setting and may reduce premature fruit drop, thereby increasing apple yield.

(ii) Parameters: The pollination condition (natural pollination vs bee colony) is the experimental factor. The measured parameters are **fruit set (%)** and **fruit drop (%)**; these together indicate fruit yield.

(iii) Comparison: Place B with bee colonies has about **40% fruit set** compared with about **26%** under natural pollination. Its fruit drop is only about **8%** compared with about **35%**. Thus, Place B has both higher fruit setting and much lower fruit drop, indicating higher yield.

(iv) Inference: The data support the conclusion that beekeeping/managed bee pollination can improve pollination success and contribute to higher apple fruit yield in this investigation.

Exam Tip: Use the exact terms from the chapter: asexual reproduction → clones; pollination → transfer of pollen from anther to stigma; fertilisation → fusion of gametes; zygote → fertilised egg; ovulation → release of a mature egg from an ovary.

13. A student claims, “In humans, ovulation always happens on day 14 of the menstrual cycle.” Critically examine this claim and state whether it is correct or not. Give at least two reasons.

Answer: The claim is not correct as a universal statement.

1. The chapter states that the menstrual cycle typically ranges from **21–35 days**, although a 28-day cycle is often used as a typical example; therefore ovulation need not occur on day 14 in every cycle.
2. Ovulation occurs around the middle of a cycle and the exact timing can vary from person to person and from one cycle to another.
3. Factors affecting cycle length and hormonal changes can shift the timing of ovulation. Therefore, “day 14” is a useful approximation for a typical 28-day cycle, not an absolute rule.

QUICK REVISION — CHAPTER 11

High-priority concepts and definitions

Reproduction: The biological process by which living beings produce new individuals of their own kind. It ensures continuity of life and transfer of genetic information.

Asexual reproduction: Involves one parent. Examples include vegetative propagation, budding and spore formation. Mitosis produces genetically identical offspring called clones.

Sexual reproduction: Involves contribution of genetic material from two individuals. Meiosis forms haploid gametes and creates combinations that contribute to variation.

Flower reproduction: Stamen is the male part and produces pollen. Pistil is the female part and includes stigma, style and ovary. Pollination transfers pollen from anther to stigma. Fertilisation forms a zygote; ovules become seeds and the ovary becomes a fruit.

Human reproduction: Testes produce sperm; ovaries produce eggs. Human body cells have 46 chromosomes, while sperm and eggs have 23. Fusion restores the zygote to 46 chromosomes.

Menstrual cycle: Ovulation is typically around the middle of the cycle. The chapter gives a typical 28-day cycle, but also states that cycles commonly range from 21–35 days. Therefore, day 14 is not an absolute rule.

Pregnancy: After fertilisation, the zygote divides and implants in the uterine lining. Human pregnancy lasts about nine months and is divided into three trimesters.

Prevention: The chapter discusses condoms, oral contraceptive pills, IUDs such as Copper-T, and surgical methods. Condoms can also help prevent transmission of sexually transmitted infections.

Key answers: Q1 (ii) • Q2 (iii),(i),(ii),(iv) • Q3 (iv) • Q11 Tomato—self, Wheat—self, Papaya—cross • Q12 Bee colony → higher fruit set and lower fruit drop • Q13 "Day 14 always" is incorrect.