

QB365 Question Paper Software
12th Standard - Biology
Sexual Reproduction in Flowering Plants Case Study
Questions

Exam Time: 00:30 Hrs

Date: 2025-10-14

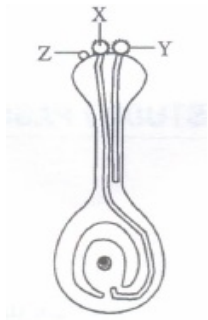
Total Marks: 8

Questions:

Case Study Questions

1. Read the following and answer any four questions from (i) to (v) given below:

Cross pollination is the transfer-of pollen grains from the anther of a one flower to the stigma of a genetically different flower. It is performed with the help of an external agency which may be abiotic (e.g., wind, water) or biotic (e.g., insects, birds, bats, snails). The diagram shows the longitudinal section of a carpel of an insect pollinated flower.



(i) What is the most likely reason for non germination of pollen grain Z?

(a) Pollen grains X and Y were brought to the stigma earlier, therefore, their germination inhibited the germination of pollen grain Z.

(b) Pollen grain Z was brought to the flower by wind, while pollen grains X and Y were brought to the flower by insect

(c) Pollen grain Z lacks protrusions that allow it to adhere properly onto the stigma surface

(d) Pollen grain Z comes from a flower of an incompatible species

(ii) Which of the following best describes the function of the pollen tube?

(a) It acts as a conduit to transport male gametes from the anther to the ovule

(b) It acts as a conduit to transport male gametes from the stigma to the ovule.

(c) It contains key nutrients that serve to nourish the newly-formed zygote

(d) It digests the tissues of the stigma, style and ovary.

(iii) Pollination of a flower in which the pollen is carried by an insect is called

(a) anemophily (b) ornithophily (c) entomophily (d) malacophily.

(iv) Refer to the given characteristics of some flowers:

A. The stamens hang out of the flower, exposing the anthers to the wind.	B. The pollen grains are tiny and light	C. The flower has a sweet scent.	D. The flower petals are brightly coloured.
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How many of the above characteristics are of insect-pollinated flower?

(a) One (b) Two (c) Three (d) Four

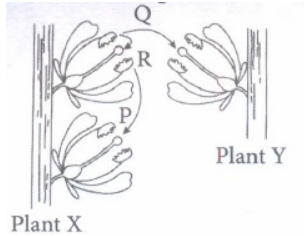
(v) Pollenkitt is generally found in

(a) anemophilous flowers	(b) entomophilous flowers	(c) ornithophilous flowers	(d) malacophilous flowers.
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2. Read the following and answer any four questions from (i) to (v) given below:

In angiosperms, the pollen grains are being transferred from the anther to the stigma and is termed pollination. This phenomenon was first discovered by Camerarius (1694) in the end of seventeenth century. Pollen grains are immobile. They cannot reach the stigma by themselves. An external agent is required for this. The pollination is mainly of two types-self pollination and cross pollination.

The diagram given below shows two plants of the same species showing different types of pollination.



(i) What is transferred between the plants in the process indicated by arrow P?

- (a) Ova (b) Pollen (c) Nutrients (d) Seeds**

(ii) Which of the following statements is correct regarding processes P, Q and R?

- (a) Processes P, Q and R introduce genetic variability in the offspring of sexually reproducing plants X and Y.**
(b) Wind serves as agent for process Q if plants X and Y belong to Genus Salvia.
(c) Flowers of plants X and Y need to produce odour and nectar for completion of processes P and Q if they are entomophilous.
(d) If plants X and Y belong to Genus Cannabis, then their flowers need to produce sticky and heavy pollens in very small amount for accomplishment of process Q.

(iii) Identify the processes P, Q and R.

- | P | Q | R |
|------------------------|--------------------|--------------------|
| (a) Geitonogamy | Xenogamy | Autogamy |
| (b) Allogamy | Chasmogamy | Cleistogamy |
| (c) Autogamy | Geitonogamy | Xenogamy |
| (d) Geitonogamy | Allogamy | Autogamy |

(iv) In Catharanthus, the growth of style brings the stigma in contact of ripe anthers present on the mouth of corolla tube. This is an example of

- (a) homogamy (b) cleistogamy (c) geitonogamy (d) xenogamy.**

(v) Which of the given processes represents a type of pollination that would result in greater adaptability of the particular species to potential environmental changes?

- (a) P (b) Q (c) R (d) All of these**

Answers Key:

Case Study Questions

1. **(i) (d):** Pollen grains can only germinate if the pollen grain and style tissues are compatible, i.e., of the same or closely related species. Pollen grains X and Y must have come from a compatible species.

(ii) (b)

(iii) (c) : Entomophily is the type of pollination that takes place through the agency of insects. The insect-loving flower possesses various adaptations by which they attract insects and use them as carrier of pollen grains for the purpose of cross pollination.

(iv) (b) : Insect-pollinated flowers produce nectar, which attract the pollinators for

feeding. Some flowers produce edible pollen grains. Flowers are fragrant and emit scent and odour. These are brightly coloured. The pollen grains are spiny, heavy and surrounded by a yellow sticky substance called pollenkitt.

(v) (b) : Insect-pollinated flowers produce nectar, which attract the pollinators for feeding. Some flowers produce edible pollen grains. Flowers are fragrant and emit scent and odour. These are brightly coloured. The pollen grains are spiny, heavy and surrounded by a yellow sticky substance called pollenkitt.

2. **(i) (b)**

(ii) (c) : In the given figure, processes P, Q and R represent geitonogamy (self pollination), xenogamy (cross pollination) and autogamy (self pollination), respectively. Pollinating agents are required for accomplishment of processes P and Q but no agent is required for process R. Out of P, Q and R, only Q is responsible for introducing genetic variability as it is cross pollination between different plants of same species. Salvia is insect pollinated whereas Cannabis is wind pollinated plant.

(iii) (a) : In the given figure, processes P, Q and R represent geitonogamy (self pollination), xenogamy (cross pollination) and autogamy (self pollination), respectively. Pollinating agents are required for accomplishment of processes P and Q but no agent is required for process R. Out of P, Q and R, only Q is responsible for introducing genetic variability as it is cross pollination between different plants of same species. Salvia is insect pollinated whereas Cannabis is wind pollinated plant.

(iv) (a) : Homogamy occur in chasmogamous or open flowers where anthers and stigmas are brought together by growth, bending or folding.

(v) (b)