Progress Check

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1. Mention if the following statements are true(T) or false(F)

(i)	**Flowers can be complete or incomplete**	**T/F**
(ii)	**A flower typically has six floral whorls.**	**T/F**
(iii)	**Bracts are usually green, but sometimes large and colorful.**	**T/F**
(iv)	**Nasturtium has nectaries**	**T/F**
(v)	**Stamens and carpels are the male and female parts**	**T/F**
(vi)	**The prefix "gamo-" is used whenever any of the floral whorls are used**	**T/F**
(vii)	**Stigma may be simple or divided into two or more lobes.**	**T/F**
(viii)	**Papaya is monoecious plant.**	**T/F**

Solution:

(i) The statement is true
(ii) The statement is false. A flower has four whorls.
(iii) The statement is true
(iv) The statement is true
(v) The statement is false. Stamens are carpels are the male and female parts respectively of the flower
(vi) The statement is true
(vii) The statement is true
(viii) The statement is false. Papaya is a dioecious plant.

Review Questions

A. Multiple Choice Type

1. Bougainvillea flower is an example of
(a) Incomplete flower
(b) Having a large nectary
(c) Water pollination
(d) Large colorful bracts
Solution:
(d) Large colorful bracts.
Bougainvillea is large, coloured bracts bearing the flowers.

2. A flower is said to be complete when:
(a) It has the corolla and calyx
(b) It has the corolla and gynoecium
(c) It has the androecium and gynoecium
(d) It has all the four whorls.
Solution:
(d) It has all the four whorls.
The four whorls are – calyx, corolla, androecium and gynoecium.

3. The part of the flower that gives rise to the fruit is
(a) Sepals
(b) Petals
(c) Ovary
(d) Stamens
Solution:
(c) Ovary
The ovary develops into ovules – the seeds.

4. The part of the flower that gives rise to the seed is
(a) Ovary
(b) Placenta
(c) Ovule
(d) Pollen grain
Solution:
(c) Ovule
It is the swollen area in the ovary that attaches the ovules to the wall of the ovary known as placenta.

5. The essential whorls of a flower are the
(a) Calyx and corolla
(b) Stamen and ovary
(c) Calyx and epicalyx
(d) Androecium and gynoecium

Solution:
(d) Androecium and gynoecium

B. Very Short Answer Type

1. Match the parts in Column A with the flowers or parts of flower in Column B.

Column A	Column B
(a) Polyadelphous	**(i) Polypetalous**
(b) Pollen grains	**(ii) calyx, corolla**
(c) Free petals	**(iii) Nectar**
(d) Non-essential	**(iv) Bombax**
(e) Sweet fragrant fluid	**(v) Pollen sac**

Solution:

Column A	Column B
(a) Polyadelphous	Bombax
(b) Pollen grains	Pollen sac
(c) Free petals	Polypetalous
(d) Non-essential	Calyx, corolla
(e) Sweet fragrant fluid	Nectar

C. Short Answer Type

1. Explain the following terms:
(a) Incomplete flower
(b) Staminate flower
(c) Pistillate flower
(d) Bisexual flower

Solution:
(a) Incomplete flower - A flower is said to be incomplete when one or more sets of floral structures are not present/missing. Example – Sweet corn.
(b) Staminate flower – It is a unisexual flower having stamens only. The male part of the flower is known as staminate flower. Example – Eastern cottonwood.
(c) Pistillate flower – It is a flower having carpels only. The female parts of a flower are the pistillate flower. Example – Date palm
(d) Bisexual flower – It is a flower having both male (stamens) and female(carpels) parts. It is also known as hermaphrodite flower. Example – Hibiscus.

2. Distinguish between the following pairs:
(a) Flower and inflorescence
(b) Petals and petaloid sepals

(c) Polyandrous and Polyadephous androecium

Solution:

The differences are as follows:

(a)

Flower	Inflorescence
It is specialized shoot wherein the leaves are altered into floral structures.	It is the mode of arrangement of flowers on the plant axis.

(b)

Petals	Petaloid sepals
They are the non-essential parts of a flower that renders protection to the reproductive parts thereby making the flower attractive in order for pollination.	The non-green perianth is called as petaloid. The perianth is the undifferentiated sepals and petals together together.

(c)

Polyandrous androecium	Polyadephous androecium
The filaments of the stamens are free	The filaments of the stamens are united in multiple groups

3. Where are the following structures/parts located and what are their functions?

(a) Placenta

(b) Thalamus

(c) Anther

(d) Stigma

Solution:

The following table depicts the structure and function of the respective structures.

	Name of the structure	Location	Function
a	Placenta	Swollen area or cushion in the ovary	Renders origination to the ovules
b	Thalamus	Tip of the stalk of the flower	Bears all the flower parts
c	Anther	Section of the stamen	Production of pollen grains
d	Stigma	Knob-like structure at the terminal	During pollination, provides landing site for the pollen grains

4. Why are the following describes as stated:

(a) The androecium of pea flower is diadelphous

(b) Ray florets of sunflower as neuters

(c) Salvia sepals as petaloid

Solution:

(a) It is because the filaments of anthers are united and clubbed together in 2 bundles. Nine out of ten stamens in a pea plant form a stamina tube. The tenth is free.

(b) It is because both the female and male reproductive structures are absent.

(c) Sepals of the salvia are petaloid as 3 sepals are red in color and united as petals. Therefore, they are not differentiated from the petals.

D. Long Answer Type

1. Name the different types of androecium found in flowers.

Solution:

The different types of androecium that are found in flowers are as follows:

- Monadelphous – Anthers are free. Stamens are grouped by their filaments. Example-China rose
- Diadelphous – Filaments are united in two bundles. Example - Pea
- Polyadelphous – Filaments are united in a few groups. Example - Bombax

2. Name the type of androecium found in

(a) China rose

(b) Bombax

(c) Pea

Solution:

The type of androecium found in the following structures are:

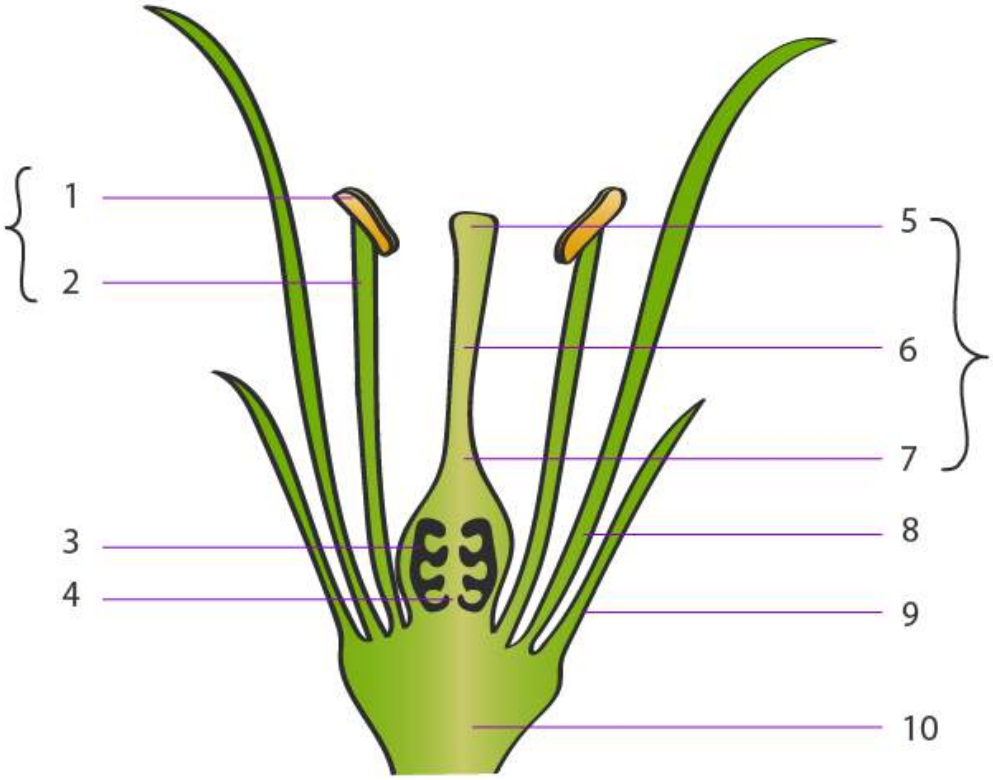
(a) China rose – This plant displays Monadelphous androecium, wherein the stamen is united in one group by their filaments and anthers are free.

(b) Bombax – This plant displays Polyadelphous androecium, wherein filaments are united in a few groups.

(c) Pea – This plant displays Diadelphous androecium, wherein filaments are united in two bundles. Nine out of ten filaments form the stamina tube and the tenth is left free.

E. Structured/Application/Skill Type

1. The figure given alongside represents generalized arrangement of the different parts of a bisexual flower. Name the parts numbered 1-10.



Solution:

Listed below are the different parts of a bisexual flower.

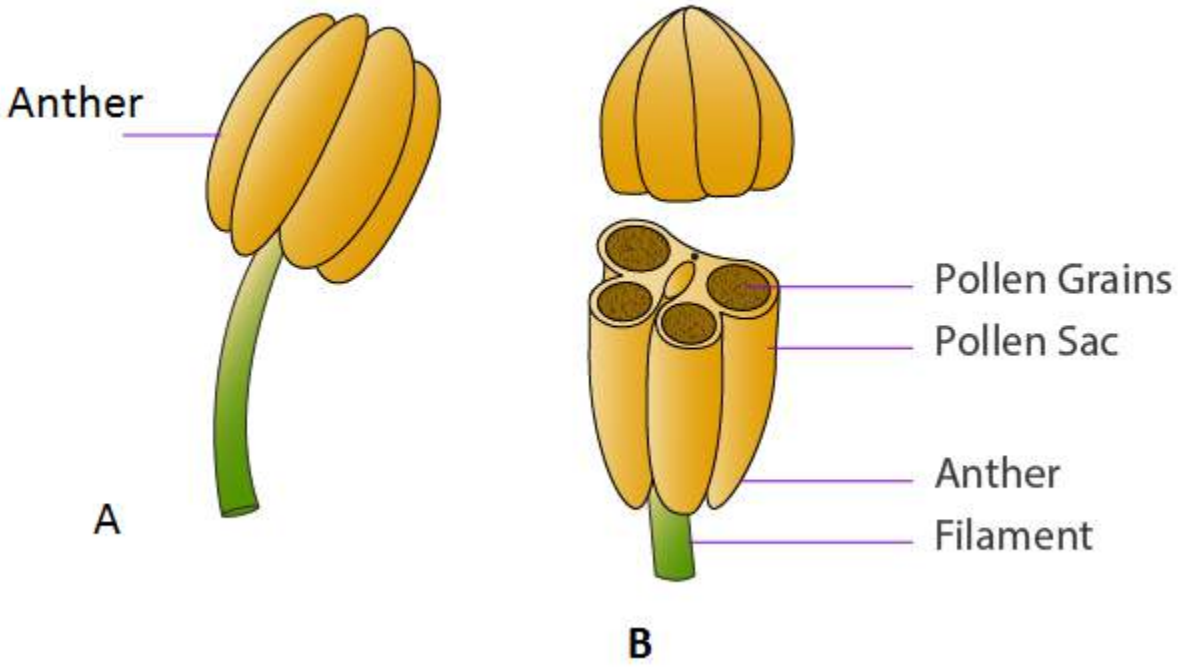
1 – Anther
2 – Filament
3 – Ovule
4 – Placenta
5 – Stigma
6 – Style
7 – Ovary
8 – Petal
9 – Sepal
10 – Thalamus/Receptacle

2. Given alongside are two figures (A & B) of a certain part of a flower. Study the figures carefully and answer the following questions:

(a) Which major organs of a flower does the figure A represent? What is the collective term for this organ?

(b) Are the contents of the pollen sacs in B male or female?

(c) Can you state how the contents of the pollen sacs would come out?



Solution:

(a) The figure A represents stamen. Collectively, stamens form androecium.
(b) The contents of the pollen sacs in B are male gametes.
(c) The contents of the pollen sacs can come out by the following modes:
- Wind
- Insects

3. What are bracts? State their function.

Solution:

When a flower arises in the axil of a leaf-like structure, the structure is called as bract. They can be green as seen in ordinary leaves or can be coloured. Since they are large and brightly coloured, they are often mistaken to be petals. This causes insects to get attracted for pollination.

4. Explain the terms Monadelphous, Diadelphous and Polyadelphous. In each case name a flower possessing such an androecium.

Solution:

Type of Androecium	Flower Processing	Example
Monadelphous	Anthers' filaments are fused in a flower to form one group	Hibiscus
Diadelphous	Anthers' filaments are fused in a flower to form two groups	Pea
Polyadelphous	Anthers' filaments are fused in a flower to form more than two groups	Bombax