

ST. XAVIER'S SCHOOL

BELGUMA, PURULIA

Sub-Biology L-2 (The flower)

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MAIN POINTS

1.A flower is the most beautiful and colourful part of a plant. It is also known as the bloom or blossom of a plant. It is the reproductive organ of a plant.

2.A flower is attached to the shoot by a stalk or pedicel.

3.The tip of the stalk is enlarged and slightly flattened to form thalamus.

4.A complete flower has four whorls(rings) -calyx , corolla , androecium and gynoecium.

5.Calyx forms the outermost whorl of a flower. The sepals are collectively called calyx. It protects the flower bud.

6.Corolla forms the second innermost whorl. The petals are collectively called corolla .Its main function is to attract insects for pollination.

7.The third whorl is called androecium. It is the male reproductive structure. It is made up of stamens. Each stamen has two parts-filament and anther. The filament is a thin, thread -like structure which bears an anther at its tip. The anther contains pollen sacs which produce pollen grains. These pollen grains contain the male gametes.

8.The fourth innermost whorl is called the gynoecium. It is the female reproductive structure of a flower. Gynoecium is made up of carpel or pistil. Each pistil has three

parts- stigma , style and ovary. The ovary contains small, rounded bodies called the ovules. The ovules contain the female gamete.

9.A gamete is the male or female reproductive cell.

10.The four whorls of a flower are arranged on the thalamus.

11.There are two types of flower- complete flower and incomplete flower.

12.A flower that has all the four whorls (calyx ,corolla ,androecium and gynoecium) is called a complete flower .e.g - hibiscus, rose, pea plant ,tulip etc.

13.A flower lacking one or more of the whorls is called an incomplete flower. e.g- papaya, watermelon, cucumber, pumpkin, bitter gourd etc.

14.Pollination is the process of transferring pollen grains from the anthers to the stigma of a flower.

15.There are two types of pollination- self pollination and cross pollination.

16.Agents of cross pollination are insects, wind, water and animals.

17.The fusion of male gamete and female gamete is called fertilization.

18.A fruit is the ripened ovary. The ovules inside the ovary develop into seeds. The sepals and petals fall off.

19.A fruit has two parts- pericarp (fruit wall) and the seeds.

20.The pericarp has three layers- epicarp , mesocarp and endocarp.

21.The ovules after fertilization develop into seeds .

22. There are two types of seeds- monocotyledonous seeds and dicotyledonous seeds.

23. The process by which the embryo in the seed grows into a young plant in the presence of water, air and suitable temperature is called germination.

24. A zygote is formed after the process of fertilization. This zygote develops into an embryo later on.

25. The plant embryo, sometimes called the seed embryo is the part of a seed that contains the earliest forms of a plant's root, stem and leaves.

26. A seedling is a very young plant which grows from a seed.

27. Cotyledons or seed leaves are present inside the seed. These absorb the food from the parent plant and store it for the embryo. These also protect the embryo.

28. Zygote is the cell that is formed by the union or fusion of a male gamete and female gamete.

29. Germination is of two types- epigeal germination and hypogeal germination.

30. In epigeal germination, the cotyledons are pushed above the ground. While in hypogeal germination, the cotyledons remain under the soil.

WORK TO BE DONE IN THE BOOK

(MULTIPLE CHOICE QUESTIONS -Pg.nos.23 and 24)

1. (a) -Ans. i (b) Ans. ii (c) Ans. iii (d) Ans.i (e) Ans. ii (f) Ans.iv (g) Ans.i (h) Ans. ii (i) Ans iv

SHORT ANSWER QUESTIONS (pg.no.24, 25 and 26)

2. Name the following:(Do this in the book)

a) pea seed or maize grain (b) maize grain (c) bean seed (d) bean seed

3. Differentiate (Do this in the notebook)

(a) Radical develops into a root. Plumule develops into a shoot.

(b) Hilum is the scar on a seed marking the place where the seed was attached to the fruit wall. Micropyle is a small opening in a seed which helps in absorbing the water at the time of germination of the seed.

(c) Testa is the outer exposed part of a seed, also called the seed coat. It protects the seed from the insects, bacteria and mechanical injury.

Tegmen is the inner thin seed coat which lies under the testa. It protects the embryo from dehydration and mechanical injury.

4. Ans in [pg.no.](#) 18 (Do this in the notebook)

5. a) Ans iii (b) Ans.i (c) Ans ii (d) Ans v (e) Ans iv (DO THIS IN THE BOOK)

6. Radical emerges out of the seed earlier than plumule, as it absorbs water and essential nutrients from the soil which helps in the growth of plumule and allows the photosynthesis to occur by providing raw materials. (Copy work)

7. a) true (b) true (c) false (d) true (Do this in the book)

8. Do this in the book.

a) Radical develops into a root which absorbs water and essential nutrients from the soil to help in the growth of the plumule.

b) Cotyledons store food material which is used by the seedling for growth.

c) Endosperm stores food in the form of starch in the maize grain .

d) Micropyle helps in the absorption of water at the time of germination of seed.

9. Ans (a) (Do this in the book)

10.a)radical b) plumule (book)

LONG ANSWER QUESTIONS pg.no.26

(WRITE THE ANSWERS IN YOUR NOTEBOOK)

1. Pollination is the transfer of pollen grains from the anthers to the stigma of a flower. There are two types of pollination- self pollination and cross pollination. In self pollination , the pollen grains from the anthers fall on the stigma of either the same flower or another flower on the same plant. In cross pollination, pollen grains are transferred from the anthers of one flower to the stigma of another flower on another plant of the same kind.

2. Two problems that will be faced by the new plants are: i) They
will become overcrowded . The new plants will not get enough sunlight to grow properly.

ii) They will compete for water and nutrients from the soil. A large number of plants growing in a small area will not have sufficient water and essential nutrients for their development . So they will have to compete for all their requirements.

3. Ans in the book pg.no.12 . Draw the diagram given in Fig.2.1 in [pg.no.](#) 13 and also label its different parts.

4.Draw the structure of a dicot seed and also label it .(Fig.2.9 [pg.no.](#) 18)

A dicot seed is covered by a seed coat. The seed coat has two layers- an outer layer called testa and an inner layer called tegmen. The seed coat protects the seed from the insects, bacteria and mechanical injury. There is a scar on the seed coat called hilum. Through the hilum the developing seed is attached to the fruit wall. Above the hilum, there is a small pore called micropyle which absorbs water and also controls the entry of water into the seed during germination. Inside the seed, lies two fleshy seed leaves called cotyledons. These cotyledons contain stored food which is used by the seedling for its growth. In between the two cotyledons, lies a delicate embryo. The

embryo has a radical and plumule. The radical develops into a root while the plumule develops into a shoot.

5. The process by which the embryo in the seed becomes active in the presence of water, air and suitable temperature, and grows into a young plant or seedling is called germination. There are two types of germination- epigeal germination and hypogeal germination. Epigeal germination is found in the bean seed. Here the cotyledons are pulled above the surface of the ground. The leaves unfold and start preparing food for the growing plant. Hypogeal germination is found in the maize grain. Here the cotyledon remains under the soil. The plumule only comes out of the soil to form leaves.

6. The three conditions necessary for the germination of seed/seeds are water, air (oxygen) and favourable temperature.

Water is required by the seed for germination. The uptake of water by seed is called imbibition, which leads to the swelling and breaking of the seed coat. Seed needs oxygen so that it can produce energy for germination and growth. It also needs the right temperature to germinate, and this varies depending on the type of plant and its environment.

7. Hypogeal germination

- i. Germination takes place below the ground.
- ii. Cotyledons remain inside the soil.
- iii. Epicotyl elongates faster than hypocotyl.
- iv. Cotyledons do not undergo photosynthesis.
- v. Occurs in maize, pea, groundnut etc.

Epigeal germination

- i. Germination takes place above the ground.
- ii. Cotyledons emerge out of the soil.
- iii. Hypocotyl elongates faster than epicotyl.
- iv. The cotyledons become green and undergo photosynthesis.
- v. Occurs in bean, tamarind, papaya etc.

8 a) Sepals are located in the outermost whorl of a flower

b) Petals are located in second inner whorl of a flower.

c) Anthers are located in the third whorl of a flower, inner to the petals. These are found at the tip of the filaments.

d) Stigma is located in the fourth and the innermost whorl of a flower. It lies at the tip of the style.

9. Ans in pg.no.13

10. a) Ovary develops into fruit.

Ovule develops into seed.

b) Petal attracts insects for pollination.

Sepal can make food and protects the flower bud.

c) Filament helps to carry nutrients to the anther , where pollen grains develop.

Style helps to carry pollen grains from the stigma to the ovary.

d) Pollen grains produce the male reproductive cells of plants.

Ovule produces the female reproductive cell of plants.

EXTRA QUESTION ANSWER (Work to be done in the notebook)

1.What are bisexual flowers?

Ans. Flowers that have both male and female reproductive parts are called bisexual flowers.

2. What are unisexual flowers?

Ans. Flowers that have either the male or female reproductive parts are called unisexual flowers.

3.How do insects help in pollination?

Ans. The insects sit on the flowers to collect nectar. As a result the pollen grains stick to their body. While flying from flower to flower, they carry pollen grains and these pollen grains fall on the stigma of flowers. And then the flower carries out the fertilization.

4. What are the characteristics of an insect pollinated flower?

Ans. An insect pollinated flower is usually large, brightly coloured, fragrant and produces nectar.

5. Write the characteristics of wind pollinated flowers.

Ans The characteristics of wind pollinated flowers are:

- i. The flowers are usually small and dull coloured.
- ii. They are fragrance-free.
- iii. The anthers are long protruding out of the flowers so that pollen grains may get blown off easily.
- iv. They have feathery stigmas.
- v. The pollen grains are very light.
- vi. They produce a large quantity of pollen grains.

6. Explain the process of fertilization in a flower.

Ans. As the pollen grains reach the stigma of a flower through the agents of pollination, they germinate to produce pollen tubes. One of the pollen tube finally reaches the ovary. Through this pollen tube, the male gametes are carried. Pollen tube releases the male gametes on reaching the ovule. After this the male and female gametes fuse together to form a zygote.

7. What are false fruits?

Ans. In some fruits, the thalamus becomes the main fleshy part which we eat, while the ovary remains a small central part containing the seeds. Such fruits are called false fruits. E.g. apple

8. Explain the parts of a fruit.

Ans. A fruit has two parts- a pericarp or fruit wall and seeds. The pericarp (fruit wall) develops from the wall of the ovary. The pericarp has three layers- epicarp ,mesocarp and endocarp.

Epicarp is the outer , thin protective covering of the fruit. Mesocarp is the sweet, fleshy edible middle layer. Endocarp is the inner hard part of the fruit that contains seed/seeds. E.g.mango

PROJECT WORK (TO BE DONE IN THE BIOLOGY INTERLEAF COPY)

Draw and give two examples of each:

1. Any four shapes of leaves. (Pg.no.4 -fig. 1.7)
- 2.Any four margins of leaves. (Pg.no.4 -fig. 1.8)
