2. PLANTS : STRUCTURE AND FUNCTION

1. QUESTIONS AND ANSWERS

Q. 1. Fill in the blanks :

(i) ..... arise from the nodes on a stem.

(ii) Dicotyledonous plants has .....root.

(iii) ..... protects the root-tip from injuries.

(iv) In the bud condition the petals are covered by leaf-like whorl called.....

(v) The portion of the leaf attached to the stem is called the.....

(vi) The part of the stem between two nodes is called an.....

Ans : (i) Leaves (ii) cap (iii) root cap (iv) calyx.(v) leaf-base.(vi) internode

Q. 2) Give examples of Three plants that have :

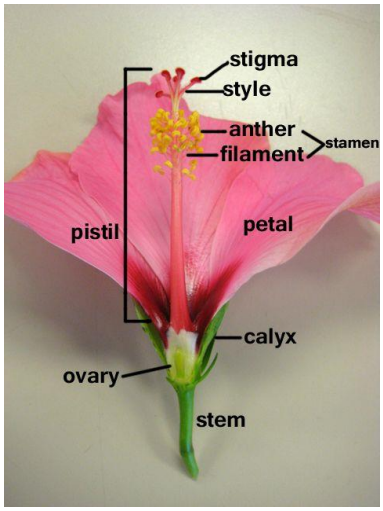
Q. 1.

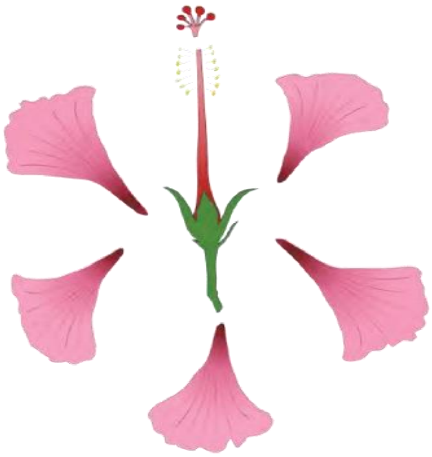
plant
(i) Spiny fruits
(ii) Spiny stem
(iii) Red flowers
(iv) Yellow flowers
(v) Leaves which close at night
(vi) Single- seeded fruits
(vii) Many- seeded fruits

Answer :

plant	Three example		
(i) Spiny fruits	1.Jack fruit	2. Datura	3. Castor
(ii) Spiny stem	1.Cactus	2.Silk floss trees	3. Silk cotton trees
(iii) Red flowers	1. Hibiscus	2. Erythrina	3. Flame of the forest
(iv) Yellow flowers	1. Golden trumpet tree	2. Golden shower tree	3. Yellow Canna
(v) Leaves which close at night	1. Amla	2. Gulmohur	3. Rain tree
(vi) Single- seeded fruits	1. Mango	2. Berries	3. Cashew
(vii) Many- seeded fruits	1. Guava	2. Jack fruit	3. Water-Melon

Q.3 Observe any one flowers, and its various parts and discribes it in your own words. a description of it in your own words .





(i) Pedicel : The stalk of the flower is called pedicel. It may be long or short . One end is attached to stem.

(ii) Receptacle : End of the pedicel which is attached to flower is enlarged and swollen. This is called a receptacle.

(iii) Calyx : Outermost whorl of the flower, green in colour and protective in nature. The petals in bud condition are covered over by calyx.

(iv) Corolla : Petals make the corolla. Petals may be coloured or white.

(v) Androecium : The male reproductive part of the flower which is made up of Stamens. Each stamen has an anther and a filament.

(vi) Gynoecium : The female reproductive part of the flower which is made up of carpels. Each carpel consists of stigma, style and ovary.

Q. 4. Write whether following statements are true or false. If false correct and rewrite them :

1. Thread-like or fibre-like roots arising from the steam are called tap root.

2. Bud and nodes are parts of stem.

3. The peepal leaf-lade has parallel venation and the maize leaf-blade has reticulate venation.

4. Leaves with undivided leaf blade and a single mid-rib are called compound leaves.

5. Coconut tree is weak and very short.

Ans : (1) false. (Thread-like or fibre-like roots arising from the steam are called fibre root.) (2) True. (3) False. (The peepal leaf-lade has reticulate venation and the maize leaf-blade has parallel venation.)(4) False. (Leaves with undivided leaf blade and a single mid-rib are called simple leaves.) (5) False. (Coconut tree is Strong and very tall.)

Q.5 Certain properties are mentioned below. Find a leaf corresponding to each property and describe those plants.

Leaves with smooth surface, leaves with rough surface, fleshy leaf, spines on leaf.

(1) Leaves with smooth surface : Banana leaf

Ans : The banana plant is the largest herbaceous flowering plant. Banana plant has smooth leaves which are used as feeding plate in many states of India. Each pseudostem normally produces a single inflorescence, also known as the 'banana heart', locally known as kelpful . Banana grown from a kelpful. It grows from a structure known as corm. It looks like a tall and sturdy tree but It's trunk is actually a 'false stem' or pseudostem. The leaves of banana plants are composed of a petiole and a lamina. The base of the petiole widens to form a sheath; the tightly packed sheaths make up the pseudostem, which supports the plant.

(2) Leaves with rough surface : Parijataka leaf (Night flowering jasmine)

Ans : As in English this tree is called 'tree of sorrow' because the flowers cannot sustain the sunlight and dry up soon with a daybreak. Parijataka tree has rough leaves. It is dwarf tree growing to about 10 metres that bears beautiful white flowers

with red peduncles. The flowers bloom at night and in the morning one can notice carpet of parijataka flowers under the tree. The rough leaves of this tree are extremely medicinal Many Ayurvedic and homeopathic drugs are prepared from these leaves. There are many mythical tales about this tree in Indian mythological literature.

(3) Fleshy leaf : Eicchornia leaf (Water hyacinth)

Ans : The leaves of Eicchornia or water hyacinth are fleshy. Water hyacinth grows in water as a submerged plant. The stem of the plant is also swollen and green. It bears blushviolet flowers throughout the year. The plant grows very rapidly and it needs to be controlled. Otherwise it causes eutrophication and depletes the oxygen in the water body causing the death of fish. Eicchorinia thus affects biodiversity and environment of water bodies.

(4) Spines on leaf : Pandanus leaf (Kevda)

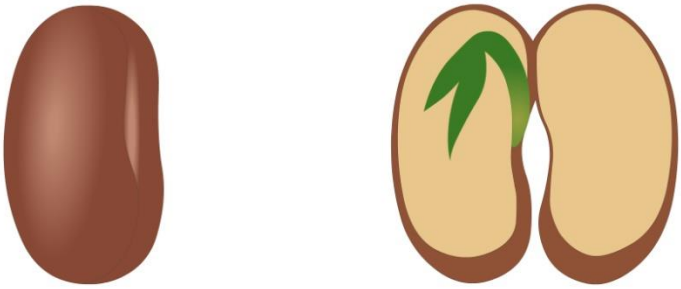
Ans: The leaf blade or lamina of pandanus bears spines. The pandanus is locally known as Kevda. These leaves are fragrant. The plant of kevda grows to about 1 metre length. The stem is strong and is of medium size. The leaves form a crown like structure at the top of the trees. They are used for

decorating. Male and female flower is borne on separate plants.

Q.6 Explain the following images in your own world :

A

B



Ans : (1) Figure 'A' is of monocotyledonus seed. It is a grain of maize Figure 'B' is of Dicotyledonous seed. It is a bean seed.

(2) Each figure show entire seed/grain and a longitudinal section of the same.

(3) In figure A : The radicle and plumule is seen inside the covering surrounded by starchy substance. There is a single cotyledon.

(4) In figure B : The radicle and plumule are seen on the upper side of cotyledon. There are two cotyledons.

Q 7. What are the similarities and differences between ?

(i) Jowar and Moong :

Ans :

(1) Similarities : Both are food stuffs.

Jowar	Moong
(i) Jowar is a monocotyledonous plant.	(i) Moong is a dicotyledonous plant.
(ii) Jowar grain is full of carbohydrates	(ii) Moong seed is full of proteins.
(iii) Jowar seed has single cotyledon.	(iii) Moong seed has two cotyledons.
(iv) Jowar grains are seen in cobs.	(iv) Moong are present in legumes.

(2) Onion and Coriander :

Ans :

(1) Similarities : Both are consumed in the form of salads. They are used as supplementary food stuffs in cooking and also for garnishing.

Onion	Coriander
i) Onion is a monocotyledonous plant. ii) The edible onion is actually a modified leaf. iii) Onion is grown from seed or its Bulb.	i) Coriander is dicotyledonous plant. ii) Coriander are leaves. iii) Coriander is grown from its seeds.

(3) Leaves of banana and mango :

Ans : Similarities : Both the leaves have religious, importance and sacred. Both's are fruits.

Leaves of banana	Leaves of mango
1. Banana is a monocotyledonous	1. Mango is a dicotyledonous plant.

plant	
2. Banana leaf has parallel venation.	2. Mango leaf has reticulate venation.

(4) Coconut tree and jowar stalk plant :

Ans : Similarities : Both are monocotyledonous plants that yield food stuffs.

.

Coconut tree	Jowar stalk plant
i) Coconut tree is strong and very tall. ii) Coconut plant is perennial. iii) Coconut tree has adventitious roots. .	i) Jowar stalk plant is dwarf and weak. Can be uprooted with ease. ii) Jowar plant dies soon after the cob is grown. iii) Jowar has adventitious and stilt roots for additional support.

Q. 8 Observe any one flower and its various parts and describe it in your own words.

Ans : Lets choose the Hibiscus flower.

(1) Hibiscus flower has a pedicel.

(2) All the whorls are arranged over the thalamus.

(3) Four important floral whorls are seen clearly. These are :

(a) Calyx : Calyx has five sepals. This part is green.

(b) Corolla : Corolla is made up of five petals which are big and bright red in colour. The petals are free from each other.

(c) Androcium : This part is a male part of the flower. The stamen looks like a long tube. At the end of this tube are seen anthers. Anthers are attached to this tube by tiny filaments. Pollen grains are seen on the anthers. Some of the pollen grains stuck up to the hands.

(d) Gynoecium : This is a female part of the flower. At the end of the flower, near thalamus the gynoecium is present. After taking the vertical section of the flower by a blade, the ovules are seen inside the ovary. The style starts from the ovary and ends in five stigma at the top of the flower. The gynoecium is thus made up of five carpels.

Q. 9 Answer the following questions :

(1) Describe the functions of various parts of a plant.

Ans : (1) Various of the plant are as follows : Root, stem, leaves, flower and fruit.

(2) Functions of the leaves : Reproduction

(3) Functions of the leaves : (a) Production of food by performing photosynthesis (b) Transpiration, i.e. giving out excess of water (c) Modified leaves perform additional functions such as reproduction, food storage, support etc.

(4) Functions of the leaves : Protection of seeds and storage of food materials.

(5) Functions of the roots : (a) anchoring and supporting the plant (b) absorption of water and minerals (c) Some roots show some modifications for performing additional functions. e.g. Aerial roots absorb moisture from air, stilt-roots-give additional support, runners-help in vegetative propagation, breathing roots (pneumatophores)- breathe for plants, some underground roots store food materials etc.

(6) Functions of the stems : (a) To hold all the branches of the plant (b) To perform function of photosynthesis as in cactus (c)To transport water absorbed by the roots to all the parts of a plant and to transport food prepared by the leaves to various plant parts. (d) Modified stems perform functions such as food storage, reproduction, support etc.

(2) What are the different parts of stem?

Ans : (1) There are nodes on the stem from where the leaves come out. (2) The part of the stem between two successive

nodes is called an internodes. (3) The tip that is the apical end of the stem is called a bud. (4) There is also a bud in the axils of the from where the branches arise.

(3) What are the different types of leaves according to their arrangement of leaves on the stem and their shapes?

Ans : According to the arrangement of leaves on the stem they are alternate, Opposite, whorled, spiral, etc. According to their shape, leaves are rounded (obovate), palmate, lanceolate, linear, etc.

(4) What are the different types of roots ?

Ans : (1) Tap root and fibrous roots are the two main types of roots. (2) Dicotyledonous plants have tap roots while monocotyledonous plants have fibrous roots (3)In some plants the roots are modified to perform additional function. These roots are aerial roots, stilt - roots, stilt- roots, runners, breathing roots (pneumatophores).(4) Some roots called adventitious roots grow from the stem just above the soil.

(5) Describe the structure of tap root.

Ans : (1) Tap root is the main root of the dicotyledonous plants, that grows from the radicle. (2) Dicotyledonous plants have tap roots while monocotyledonous plants have fibrous

roots (3) In some plants the roots are modified to perform additional functions. These roots are aerial roots. stilt- roots, runners, breathing roots (pneumatophores). (4) Some roots called adventitious roots grow from the stem just above the soil.

10. ACTIVITY / EXPERIMENTS:

(i) Find the plant parts :

r	b	u	d	x	s	r	f
o	w	p	y	e	t	a	l
o	l	l	d	n	e	d	o
t	a	o	i	l	m	i	w
c	n	e	t	a	l	c	e
a	v	o	v	u	m	l	r
p	e	t	a	l	s	e	o
r	o	o	t	h	a	i	r

Answer :

1. root	2. bud	3 calyx	4 vein
5. stem	6. radicle	7 flower	8 petals
9. root hair	10 root cap	11.Leaf	12. petal

Q. 11 Use your brain power :

(1) What would have happened if plants like tamarind, banyan and mango had fibrous roots?

Ans : Tamarind and mango are huge trees with a grand canopy of leaves. The roots of these plants should be strong enough to support these trees. If they had fibrous roots, the trees will be uprooted and fallen down.

(2) Of what use to a plant are the insects fitting about around its flowers?

Ans : Insect help in pollination of the flowers. They transfer the pollen grains from one flower to another.

(3) What will happen if the root-tip is injured?

Ans : If the root tip is injured, the growth of the plant will be stunted, Initially the tree will try to survive but injured root may not absorb water and minerals from the soil. This will make the tree weak . The support of the tree will also become insufficient and the tree will eventually die.

(4) Which types of roots do the fenugreek, spinach and onion plants have?

Ans : Fenugreek has tap root but it does not traverse deep down in the soil. Spinach also has tap root which bears many secondary roots. Some of these are seem growing horizontally in the soil. Onion has fibrous roots. They emerge from disc shaped structure which is a modified stem.

Q 12. Explain two types of Venation

Ans : a) Reticulate Venation : There is a single mid-vein which is in the mid-line of the leaf blade. This makes leaf appear to be divided in two halves. The mid-vein gives rise to secondary veins. These veins branch and form a network or reticulum. E.g. Leaves of dicotyledonous plants. E.g Peepul

b) Parallel Venation : The veins run parallel to each other. They start from the leaf-base and end in the leaf apex e.g. Leaves of monocotyledonous plants e.g. Maize

Q 13. Explain Leaf and types of Leaf

Ans : Leaves arise from the nodes on a stem.

- Generally leaves are thin, flat and green in color.
- Leaf-blade or lamina- The broad, spread out part of the leaf.
- Leaf-Margin : Edge of the leaf-types of leaf margins: Entire, dentate and lobed

- Leaf apex : tip of the leaf.

  Types of leaf apex : Tapering, pointed or rounded.
- Petiole: The stalk of leaf. Some leaves have petioles, some do not have petiole.
- Leaf-base : The portion of the leaf attached to the stem
- Stipules : Small leaf-like structures near the leaf-base. Some leaves have stipules some leaves do not have stipules.

Types of Leaves : a) Simple leaves: Single undivided leaf blade with single mid rib

b) compound leaves: Leaf-blade divided into many small leaflets.

Q 14. Explain Stem

Ans : The stem grows above the soil

- The sprouting seed produces plumule, from the plumule the stem grows.
- Length of stem gradually increases as the sprout grows.
- Nodes on the stem are the points form where the leaves come out.
- Between two successive nodes is an internode.
- The tip or the apical end of the stem is called a bud.