BIOLOGY

NEET

CRASH COURSE

MORPHOLOGY OF FLOWERING PLANTS

SMART ACHIEVERS

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MORPHOLOGY OF FLOWERING PLANTS

1. Flowering plants exhibit enormous variation in shape, size, structure, mode of nutrition, life span, habit and habitat.
2. They have well developed root and shoot systems.
3. Root system is either tap root or fibrous. Generally, dicotyledonous plants have tap roots while monocotyledonous plants have fibrous roots.
4. The roots in some plants get modified for storage of food, mechanical support and respiration.
5. The shoot system is differentiated into stem, leaves, flowers and fruits.
6. The morphblogical features of stems like the presence of nodes and internodes, multicellular hair and positively phototrophic nature help to differentiate the stems from roots.
7. Stems also get modified to perform diverse functions such as storage of food, vegetative propagation and protection under different conditions.
8. Leaf is a lateral outgrowth of stem developed exogenously at the node.
9. These are green in colour to perform the function of photosynthesis.
10. Leaves exhibit marked variations in their shape, size, margin, apex and extent of incisions of leaf blade (lamina).
11. Like other parts of plants, the leaves also get modified into other structures such as tendrils, spines for climbing and protection respectively.
12. The flower is a modified shoot, meant for sexual reproduction, The flowers are arranged in different types of inflorescences.
13. They exhibit enormous variation in structure, symmetry, position of ovary in relation to other parts, arrangement of petals, sepals, ovules etc.
14. After fertilisation, the ovary is converted into fruits and ovules into seeds.
15. Seeds either may be monocotyledonous or distotyledonous.
16. They vary in shape, size and period of viability.
17. The floral characteristics form the basis of classification and identification of flowering plants.
18. This can be illustrated through semi-technical description of families.
19. Hence, a flowering plant is described in a definite sequence by using scientific terms.
20. The floral features are represented in the summarised form as floral diagrams and floral formula.

EXERCISE

Q.1 Radish is an example of -
(1) Fusiform root (2) Napiform root (3) Conical root (4) Tuberous root

Q.2 Roots associated with nitrogen fixing bacteria are -
(1) Fusiform root (2) Napiform root (3) Nodulated root (4) Conical root

Q.3 The edible part of turnip is -
(1) Modified Adventitious roots (2) Modified tap root
(3) Stem (4) Underground stem

Q.4 Shoot/Stem develops from -
(1) Plumule (2) Radicle (3) Both 1 & 2 (4) None of the above

Q.5 Lateral branches of stem are -
(1) Endogenous in origin (2) Exogenous in origin
(3) Both (4) None of the above

Q.6 Rhizome of ginger is a modification of stem because -
(1) It bears Adventitious roots (2) It bears nodes and internodes
(3) It is underground (4) It stores food material

Q.7 Phylloclade is found in -
(1) Opuntia (2) Cactus (3) Acacia (4) both (1) & (2)

Q.8 Nodulated roots occurs in
(1) Leguminosae (2) Solanaceae (3) Malvaceae (4) Papilionatae

Q.9 In onion the swollen underground structure is -
(1) Root (2) Rhizome (3) Bulb (4) Tuber

Q.10 Stem modified into leaf like structure and leaves are changed into spines in -
(1) Phyllode (2) Tuber (3) Phylloclade (4) All the above

Q.11 An edible inflorescence is
(1) Brassica rapa (2) Mustard (3) Raphanus Sativus (4) Brassica oleracea

Q.12 Caryopsis fruit is found in -
(1) Wheat (2) Pea (3) Gram (4) Lentil

Q.13 The tissue which attaches the ovules inside the ovary is
(1) Funicle (2) Hilum (3) Placenta (4) Chalaza

Q.14 Pappus is modification of -
(1) Bracts (2) Corolla (3) Calyx (4) All

Q.15 A characteristic of angiosperm is
(1) Flowers (2) Roots (3) Seed (4) All

Q.16 Cruciform corolla is found in
(1) Pea (2) China rose (3) Radish (4) Sunflower

Q.17 Geocarpic fruit is -
(1) Carrot (2) Radish (3) Ground nut (4) Turnip

Q.18 Pneumatophores are found in -
(1) The vegetation which is found in marshy and saline lake
(2) The vegetation which found in saline soil
(3) Xerophytes
(4) Epiphytes

Q.19 Tetradyanamous conditions occur in : –
(1) Cruciferae (2) Malvaceae (3) Solanaceae (4) Lilliaceae

Q.20 What is the eye of potato :–
(1) Axillary bud (2) Accessory bud (3) Adventitious bud (4) Apical bud

Q.21 An example of axile placentation is :-
(1) Marigold (2) Argemone (3) Dianthus (4) Lemon

Q.22 Vegetative propagation in mint occurs by :-
(1) Sucker (2) Runner (3) Offset (4) Rhizome

Q.23 The technical term used for the androecium in a flower of China rose (Hibiscus rosasinensis) is :
(1) Polyadelphous (2) Monadelphous (3) Diadelphous (4) Polyandrous

Q.24 Ovary is half-inferior in the flowers of :
(1) Cucumber (2) Guava (3) Plum (4) Brinjal

Q.25 Keel is characteristic of the flowers of :
(1) Bean (2) Gulmohur (3) Cassia (4) Calotropis

Q.26 Epigynous flowers are present in :-
(1) Mustard (2) Brinjal (3) China rose (4) Cucumber

Q.27 In Dianthus, placentation is :-
(1) Basal (2) Free central (3) Axile (4) Marginal

Q.28 Zygomorphic flowers mainly found in :-
(1) Solanaceae (2) Malvaceae (3) Cruciferae (4) Liliaceae

Q.29 Placentation of cruciferae plant is:-
(1) Parietal (2) Axial (3) Basal (4) Marginal

Q.30 Dye 'Neel' is obtained from : -
(1) Indigofera tinctoria (2) Brassica oleracea (3) Brassica rapa (4) Capsella bursa pestoris

Q.31 The special feature of the ovary in cruciferae is:-
(1) Hypogyny (2) Polyandry
(3) False septum / Replum (4) One row of ovules on each placenta

Q.32 Inflorescence in Malvaceae is generally:-
(1) Racemose (2) Solitary / Cymose (3) Cyathium (4) Hypanthodium

Q.33 Potato, tomato, brinjal, mustard and cauliflower belongs to how many genera:-
(1) Five (2) Four (3) Three (4) Two

Q.34 ***Lycopersicon esculentum*** belongs to family:-
(1) Solanaceae (2) Malvaceae (3) Cruciferae (4) Cucurbitaceae

Q.35 From which part of ***Atropa belladona***, the drug belladona is obtained:-
(1) Roots (2) bark (3) Stem (4) All parts of the plant

Q.36 Persistant calyx is characteristics of :-
(1) *Allium* / Liliaceae (2) *Mustard* / Cruciferae
(3) *Dalbergia* / Papilionatae (4) *Solanum* / solanaceae

Q.37 Atropa belladona, an important medicinal plant is of the family:-
(1) Liliaceae (2) Cucurbitaceae (3) Cruciferae (4) Solanaceae

Q.38 ***Nicotiana***, potato belongs to :-
(1) Malvaceae (2) Liliaceae (3) Solanaceae (4) Cruciferae

Q.39 Colchicine is obtained from :-
(1) *Atropa belladona* (2) *Colchicum autumnale*
(3) *Withania somnifera* (4) *Nicotiana tabacum*

Q.40 'Rat-ki-Rani' and tomato belongs to family :-
(1) Mimosoideae (2) Liliaceae (3) Solanaceae (4) Malvaceae

Q.41 The drug 'Belladona' is obtained from :-
(1) *Atropa* (2) *Rauwolfia* (3) *Solanum* (4) *Capsicum*

Q.42 Basal placentation occurs in:-
(1) Poaceae (2) Solanaceae (3) Malvaceae (4) Liliaceae

Q.43 Floral formula of Fabaceae is :-
(1) % ♂ ♀ $K_5\ C_{(5)}\ A_{1+(9)}\ \underline{G}_1$ (2) % ♂ ♀ $K_{(5)}\ C_{(5)}\ A_5\ \underline{G}_1$
(3) % ♂ ♀ $K_5\ C_{(5)}\ A_{10}\ \underline{G}_1$ (4) % ♂ ♀ $K_5\ C_{1+(2)+(2)}\ A_{(9)+1}\ \underline{G}_1$

Q.44 Floral formula of solanaceae is :-

(1) $Br \oplus ⚥ K_5 \overset{\frown}{C_{(5)} A_5} G_{\underline{(2)}}$ (2) $Br \oplus ⚥ K_{(5)} C_{(5)} A_5 G_{\underline{(2)}}$ (3) $Br \oplus ⚥ K_{(5)} \overset{\frown}{C_{(5)} A_5} G_{\underline{(2)}}$ (4) $Br \oplus ⚥ K_5 C_{(5)} A_5 G_{\underline{(2)}}$

Q.45 The floral formula $\oplus ⚥ K_{(5)} \overset{\frown}{C_{(5)} A_5} \underline{G}_{(2)}$ is that of :-

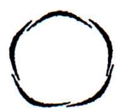
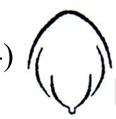
(1) Tobacco (2) Tulip (3) Soybean (4) Sunnhemp

Q.46 The corect floral formula of soyabean is :-

(1) % ⚥ $K_5C_{1+(2)+2}\ A_{(9)+1}\ G_{\underline{1}}$ (2) % ⚥ $K_{(5)}C_{1+2+(2)}\ A_{(9)+1}\ G_{\underline{1}}$

(3) % ⚥ $K_{(5)}C_{1+2+(2)}\ A_{1+(9)}\ G_{\underline{1}}$ (4) % ⚥ $K_{(5)}C_{1+(2)+2}\ A_{(9)+1}\ G_{\bar{1}}$

Q.47 Aestivation of petals in the flower of cotton is correctly shown in :

(1)  (2)  (3)  (4) 

Q.48 A monocot can be distinguished from a dicot by :-

(1) Aestivation (2) Venation (3) Both (1) & (2) (4) None of the above

Q.49 In Racemose, flowers are arranged in :-

(1) Acropetal order (2) Centrifugal order (3) Centripetal order (4) Basipetal order

Q.50 Arrangement of leaves on a stem or branch is :-

(1) Venation (2) Vernation (3) Inflorescence (4) Phyllotaxy

Q.51 Didynamous condition is related to :-

(1) Androecium (2) Inflorescence (3) Gynoecium (4) All

Q.52 When gynoecium is present in the topmost position of thalamus, the ovary is known as :-

(1) Inferior (2) Half inferior (3) half superior (4) Superior

Q.53 Drupe contains :-

(1) Stony endocarp (2) Stony mesocarp (3) Edible epicarp (4) Edible endocarp

Q.54 Monoadelphous character is found in :-

(1) Brassicaceae (Mustard) (2) Malvaceae (Chinarose)

(3) Poaceae (Grass) (4) Solanaceae (Potato)

Q.55 A characteristic feature of Ovary of Mustard is :-

(1) Presence of false septum (2) Axile placentation

(3) Epigynous (4) All of the above

Q.56 Placentaion in Solanaceae is :-

(1) Parietal (2) Marginal (3) Axile (4) Basal

Q.57 Coconut is which type of fruit ?

(1) Drupe (2) Cypsela (3) Berry (4) Cremocarp

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AIIMS Special

Instructions for following questions (Q.58 to Q.77), a statement of assertion (A) is followed by a statement of reason (R).

(1) If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).
(2) If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2).
(3) If Assertion is true statement but Reason is false, then mark (3).
(4) If both Assertion and Reason are false statements, then mark (4).

Q.58 **Assertion :** In head inflorescence florets are arranged centrifugally.
Reason : There always occurs two types of florets in a head.

Q.59 **Assertion :** Staminal tube is present in Malvaceae.
Reason : It is due to monadelphous condition.

Q.60 **Assertion :** Nest of Dischidia is a modified structure of root.
Reason : Nest roots absorb water and food from humus rich soil collected in nest.

Q.61 **Assertion :** The storage region of maize grain is whitish or yellow.
Reason : It is rich in protein granules.

Q.62 **Assertion :** There are two alae in Pisum sativum flower.
Reason : Both alae are covered by largest petal.

Q.63 **Assertion :** In angiosperms, seeds are present inside fruit.
Reason : The ripended ovary forms fruit and ripened ovules form seeds.

Q.64 **Assertion :** The plants producing flowers and fruits single time in life are called monocarpic.
Reason : Agave americana and Bambusa are monocarpic plants.

Q.65 **Assertion :** Onion is a tunicated bulb.
Reason : Characteristic smell of onion is due to presence of allyl sulphide.

Q.66 **Assertion :** Arrangement of main vein and its branches in leaf is called vernation.
Reason : Parallel venation is characteristic of dicotyledons.

Q.67 **Assertion :** A specific outgrowth present over hilum in castor seed is called strophiole.
Reason : Strophiole helps in gaseous exchange.

Q.68 **Assertion :** Roots of trapa are photosynthetic.
Reason : Trapa consist of spiny calyx.

Q.69 **Assertion :** Flower are arranged in acropetal Manner in cymose inflorescence.
Reason : All flower are at same level is cymose inflorescence.

Q.70 **Assertion :** Ovary is unilocular in parietal placentation.
Reason : Number of placenta is equal to number of ovaries.

Q.71 **Assertion :** Parietal placentation is found in cruciferae.
Reason : Ovary is bilocular in cruciferae.

Q.72 **Assertion :** Ovary of Brassicaceae is unilocular in the beginning but becomes bilocular.
Reason : Ovary of Brassicaceae become bilocular due to formations of a false septum.

Q.73 **Assertion :** Custard apple is a aggregate fruit.
Reason : It is formed by many flowers.

Q.74 **Assertion :** It is possible to identify nodes on a stem.
Reason : Leaves arise from the nodes of a stem.

Q.75 **Assertion :** Radish is a fusiform fleshy root.
Reason : Base at radish root is hypocotyl.

Q.76 **Assertion :** Cladodes are stems of unlimited growth.
Reason : Only the main stems is modified as cladodes.

Q.77 **Assertion :** Lithci is an aril.
Reason : It is dry fruit.

Q.41 Coconut fruit is a **[AIPMT 2017]**
(1) Drupe (2) Berry (3) Nut (4) Capsule

Q.42 The morphological nature of the edible part of coconut is **[AIPMT 2017]**
(1) Perisperm (2) Cotyledon (3) Endosperm (4) Pericarp

Q.43 Which of the following is a modified stem for the protection of plants from browsing animals? **[AIIMS 2017]**
(1) Tendrils (2) Thorns (3) Rhizome (4) Tuber

Q.44 Leaves of dicotyledonous plants possess _____ venation, while _____ venation is the characteristic of most monocotyledons. **[AIIMS 2017]**
(1) reticulate and parallel (2) parallel and reticulate
(3) reticulate and perpendicular (4) obliquely and parallel

ANSWER KEY

Q.1	1	Q.2	3	Q.3	2	Q.4	1	Q.5	2	Q.6	2	Q.7	4
Q.8	4	Q.9	3	Q.10	3	Q.11	4	Q.12	1	Q.13	3	Q.14	3
Q.15	1	Q.16	3	Q.17	3	Q.18	1	Q.19	1	Q.20	1	Q.21	4
Q.22	1	Q.23	2	Q.24	3	Q.25	1	Q.26	3	Q.27	2	Q.28	3
Q.29	1	Q.30	1	Q.31	3	Q.32	2	Q.33	3	Q.34	1	Q.35	1
Q.36	4	Q.37	4	Q.38	3	Q.39	2	Q.40	3	Q.41	1	Q.42	1
Q.43	4	Q.44	3	Q.45	1	Q.46	2	Q.47	3	Q.48	2	Q.49	1
Q.50	4	Q.51	1	Q.52	4	Q.53	1	Q.54	2	Q.55	1	Q.56	3
Q.57	1	Q.58	4	Q.59	1	Q.60	4	Q.61	3	Q.62	2	Q.63	2
Q.64	2	Q.65	2	Q.66	4	Q.67	3	Q.68	2	Q.69	4	Q.70	2
Q.71	1	Q.72	1	Q.73	3	Q.74	1	Q.75	2	Q.76	4	Q.77	2