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Topic: Morphology of flowering Plants

Class: 11th Ignite

Sub: Biology

EXERCISE – I

1. In China rose the flowers are
   (1) Actinomorphic, hypogynous with twisted aestivation
   (2) Actinomorphic, epigynous with valvate aestivation
   (3) Zygomorphic, hypogynous with imbricate aestivation
   (4) Zygomorphic, epigynous with twisted aestivation

   Sol. (1) In chinarose, the flowers are actinomorphic, hypogynous with twisted aestivation.

2. In China rose the flowers are
   (1) Actinomorphic, hypogynous with twisted aestivation
   (2) Actinomorphic, epigynous with valvate aestivation
   (3) Zygomorphic, hypogynous with imbricate aestivation
   (4) Zygomorphic, epigynous with twisted aestivation

   Sol. (1) In chinarose, the flowers are actinomorphic, hypogynous with twisted aestivation.

3. When the margins of sepals or petals overlap one another without any particular direction, the condition is termed as:-
   (1) Vexillary
   (2) Imbricate
   (3) Twisted
   (4) Valvate

   Sol. (2) Imbricate aestivation is the type of flower in which there is one sepal or petal that is overlapped with internal of both margins. The examples for Imbricate aestivation gulmohar and cassia.

4. All given statements are correct, except
   (1) Stolon grows horizontally but do not comes out of the soil
   (2) Offset is a short horizontal branch producing a cluster of leaves above and roots below
   (3) Sucker is found in *Chrysanthemum*
   (4) Prostrate branch with long internodes and root at nodes are characteristic to runners

Sol.[1] Stolon: It is a weak lateral branch that arises from the base of main stem. After growing aerially for some time it bends downwards to touch the ground, where its terminal bud gives rise to a new shoot and adventitious roots. The common stolon bearing plants are Jasmine, strawberry.

5. Inflorescence with single female and many male flowers
   (1) Shows centripetal opening of flowers
   (2) Cup shaped involucre
   (3) Involves complete as well as pedicellate flowers
   (4) Is represented by *Ocimum* family

Sol.[2] A cyathium is one of the specialised pseudanthia forming the inflorescence of plants in the genus Euphorbia. A cyathium consists of: Five bracteoles. These are small, united bracts, which form a cup-like involucre. Their upper tips are free and in the beginning cover the opening of the involucre.

6. Succulent testa and fleshy thalamus are edible respectively in
   (1) Pear and litchi
   (2) Pomegranate and apple
   (3) Guava and banana
   (4) Coconut and mango

Sol.[2] Pomegranate is balausta type of fruit. The fruits develop from multilocular syncarpous inferior ovary. Testa is fleshy & edible. Thalamus is the edible part of an apple fruit wherein it is the pseudocarp as the actual fruit lies inside.

7. Select the **incorrect** match
   (1) Testa and tegmen : Seed coat
   (2) Mango : Drupe
   (3) Bean seed : Endospermous
   (4) Castor : Endospermous

Sol.[3] Seeds without endosperm is called as non-endospermic seed. Example of plant having endospermic dicot seed is Ricinus communis (Castor). Example of plant having non-endospermic dicot seed is Pisum sativum (Pea).

8. Which of the following is a perispermic seed?
   (1) Black pepper
   (2) *Cynastrum*
   (3) Maize
   (4) Gram

Sol.[1] The perisperm is the nutritive tissue of a seed derived from the nucellus and deposited external to the embryo sac —distinguished from endosperm. Some examples of perispermic seeds are coffee, and black pepper.

9. Roots arise from lower nodes of stem to support main axis and enter the soil obliquely in
   (1) Sugarcane and *Zea mays*
   (2) Screwpine and *Rhizophora*
   (3) *Bombax* and *Ficus religiosa*
   (4) *Cuscuta* and *Jussiaea*

   Sol.[1] Stilt roots are adventitious aerial roots that grow obliquely downward from the main stem's basal nodes and attach firmly to the soil. Such supporting roots are found in monocot plants Examples: Maize, sugarcane.

10. Plumule in monocots is enclosed in a sheath called
   (1) Coleoptile
   (2) Coleorhiza
   (3) Aleurone
   (4) Scutellum

   Sol.[1] The plumule and radicle are enclosed in sheath which are called coleoptile and coleorhiza respectively.

11. The correct floral formula of Liliaceae family is
   (1) $\oplus \male\!\female\, P_{3+3}\, A_{3+3}\, \underline{G}_{(3)}$
   (2) $\% \male\!\female\, P_{3+3}\, A_{3+3}\, \underline{G}_{(3)}$
   (3) $\oplus \male\!\female\, P_{6}\, A_{6}\, \overline{G}_{(3)}$
   (4) $\oplus \female\, P_{3+3}\, A_{3+3}\, \underline{G}_{(3)}$

   Sol.[1] In *Liliaceae*, the flower is complete, bisexual, bracteate, trimerous, actinomorphic, hypogynous. The perianth is with 6 tepals, in two whorls 3 + 3, (polyphyllous or gamophyllous).

   The androecium is with 6 stamens, arranged in two whorls 3 + 3, Polyandrous, epiphyllous. Gynoecium with tricarpellary, syncarpous ovary, axile placentation, trilocular.

12. Select the **incorrect** statement w.r.t. maize seed
   (1) Non-endospermic
   (2) Presence of coleoptile and coleorhiza
   (3) One large shield shaped cotyledon
   (4) Membranous seed coat

   Sol.[1] Corn, **wheat** and rice, are examples of monocot seeds or monocotyledons. Embryos of a monocotyledonous seed possess only one large cotyledon called scutellum. The majority of the monocotyledonous seeds are albuminous seeds, i.e., they have thick, swollen endosperm for nourishment.

13. The plant which bears adventitious roots is
    (1) Pea
    (2) *Monstera*
    (3) Radish
    (4) Turnip

    Sol.[2] Monstera are herbs or evergreen vines, growing to heights of 20 metres (66 ft) in trees, climbing by means of aerial roots which act as hooks over branches.

14. Select the **incorrect** statement w.r.t. stem
    (1) It does not conduct water
    (2) It bears nodes and internodes
    (3) It is generally green when young
    (4) It may be modified to perform different functions

    Sol.[1] The shoot system is heterogeneous and consists of stem, branches, leaves, and flowers. The stem is negatively geotropic (moves above the soil), negatively hydrotropic (moves away from the water) and positively phototropic (moves towards the light). The stem bears nodes and internodes.

15. Find **incorrect** match.
    (1) Actinomorphic – *Datura*
    (2) Zygomorphic – Pea
    (3) Perigynous – Rose
    (4) Epigynous – Peach

    Sol.[4] Epigynous flowers includes ray florets of sunflower, guava and cucumber.

16. $A_{3+3}\underline{G_{(3)}}$ condition is concerned with the members of
    (1) Potato family
    (2) Pea family
    (3) Lily family
    (4) Tomato family

    Sol. [3] $\oplus\, ♀\, P_{3+3}\, A_{3+3}\, \underline{G}_{(3)}$

17. Select the **wrong** statement w.r.t. coconut
    (1) Endosperm – Formed by triple fusion
    (2) Mesocarp – Help in dispersal of fruit
    (3) Fruit – Drupe and developed from superior ovary
    (4) Epicarp – Thick, fibrous & edible

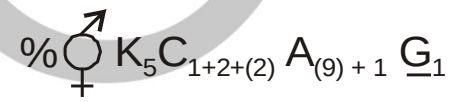
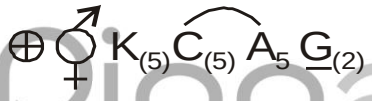
Sol.[4] The fruit of the coconut is a large, dry drupe composed of a thin outer layer (exocarp), a thick, fibrous middle layer called as a mesocarp and a hard inner layer called as an endocarp that surrounds a large seed.

18. Adventitious roots get swollen and store food in
    (1) Sweet potato, turnip and carrot
    (2) Turnip
    (3) Sweet potato
    (4) Carrot, radish and turnip

    Sol.[3] Sweet potato (Ipomoea batatas) roots develop as adventitious roots become swollen and store food.

19. Water containing cavities are present within vascular bundles of
    (1) Root of maize
    (2) Leaf of sunflower
    (3) Stem of maize
    (4) Root of sunflower

    Sol.[3] In vascular bundles, the lowermost protoxylem vessels and xylem parenchyma cells dissolve forming a water containing schizolysigenous cavity called protoxylem cavity.

20. Consider the following four statements A, B, C and D and select the right option for two **correct** statements:
    A. The ovary is said to be half inferior in perigynous flower
    B. The floral formula for fabaceae family is 
    C. The floral formula for potato family is 
    D. In *Trifolium*, ovary is inferior
    The **correct** statements are
    (1) C & D
    (2) A & C
    (3) B & C
    (4) A & D

    Sol.[2] In Fabaceae the flower is bisexual, actinomorphic, hypogynous to slightly perigynous and bracteate. Calyx: They have 5 sepals. These sepals are fused.

21. Given below are examples for different kinds of placentation
    Argemone, *Dianthus*, Pea, *Citrus*, Brinjal, Lily, Mustard, Ashwagandha, *Asparagus*
    Which of the placentation type has maximum representation?
    (1) Parietal
    (2) Marginal
    (3) Axile

(4) Free central

Sol.[3] example of axile placentation are- citrus, brinjal, lily, aswagandha, asparagus.

22. A family is identified with following conditions
A - Axile placentation
B - Epipetalous condition
C - Valvate aestivation
D - Fruit - berry
E - Actinomorphic flower
The plant family can be suggested to be
(1) Pea family
(2) Lily family
(3) Mustard family
(4) Potato family

Sol.[4] Solanaceae has= Calyx: Five sepals, gamosepalous; valvate aestivation. Corolla: Five petals, gamopetalous, valvate aestivation. Androecium: Five stamens, epipetalous. Gynoecium: Syncarpous, bicarpellary, bilocular, superior ovary, axile placentation.

23. Perennial herbs with underground variously modified stem part. Inflorescence may be umbellate clusters. The characteristics give idea about
(1) Pea family
(2) Lily family
(3) Potato family
(4) Mustard family

Sol.[2] In Liliaceae family Inflorescence: Cymose- solitary; umbellate clusters.

24. A drupe is unexceptionally characterised by
(1) Stony and hard endocarp
(2) Fleshy edible mesocarp
(3) Its origin from monocarpillary superior or inferior ovary
(4) Outer pericarp as hard and stony layers

Sol.[1] Drupe is the Fleshy fruit with hard inner layer (endocarp or stone) surrounding the seed.

25. Thorns are structure for physical defence in plants. These are characterised by
(1) Deep seated and woody nature
(2) Presence of vascular tissues
(3) Modified axillary buds
(4) All of these

Sol.[4] Thorns are modified stem originate from axxilary bud present in citrus and bougainvillea.

26. Find the odd one w.r.t. adhesion of floral parts.
    (1) Monadelphous condition in china rose
    (2) Epipetalous condition in potato
    (3) Epiphyllous condition in onion
    (4) Gynandrous condition in *Calotropis*

    Sol.[1] Monadelphous condition in china rose is the cohesion condition while Epipetalous condition, Epiphyllous condition and Gynandrous condition is adhesion condition.

27. List of different plants are given below.
    Citrus, Sunflower, Cucumber, Mustard, Belladonna, Garlic, Wheat, Sesbania
    Which of the placentation type has minimum representation?
    (1) Axile
    (2) Basal
    (3) Parietal
    (4) Marginal

    Sol.[4] (1) Axile =citrus, belladonna, garlic, (2) Basal= sunflower, wheat

    (3) Parietal= cucumber, mustard (4) Marginal=sesbania

28. Compound leaves are characterised with all of these, **except**
    (1) Axillary bud
    (2) Stipules
    (3) Rachis
    (4) Lamina without incisions

    Sol.[4] In contrast to a single leaf, the compound leaf is a leaf whose leaflets are attached to the middle vein but have their own stalks.

29. Lenticels are unregulated openings on bark. These are **not** associated with
    (1) Leaves
    (2) Stem
    (3) Root
    (4) Fruit

    Sol.[1] A lenticel is a pore present on the plant. It consists of cells with large intercellular spaces in the periderm. It has lens shaped opening. It is found in the bark of woody stems and roots of dicotyledonous flowering plants. It consists of only dead cells. Its main function is to provide an exchange of gases between internal plant tissues and the environment. It is found on bark of tree. Bark is impermeable. Hence, lenticel helps in the exchange of gases.

30. Scar on the seed through which they are attached to the fruit is called
    (1) Testa
    (2) Tegmen

(3) Hilum
(4) Raphe

Sol.[3] The hilum is a scar on the seed coat through which the developing seeds were attached to the fruit.

31. A family having perennial herbs with underground structures as bulbs, corms, rhizomes and rarely berry type fruit is identified with floral formula

(1) $Br\oplus\,\male\!\!\female P_{3+3}A_{3+3}\underline{G}_{(3)}$

(2) $\oplus\,\male\!\!\female K_{(5)}\overset{\frown}{C_{(5)}A_{(5)}}\underline{G}_{(2)}$

(3) $\%\,\male\!\!\female K_{(5)}C_{1+2+(2)}A_{(9)+1}\underline{G}_{(1)}$

(4) $\oplus\,\male\!\!\female K_{2+2}C_4A_{2+4}\underline{G}_{(2)}$

Sol.[1] $Br\oplus\,\male\!\!\female P_{3+3}A_{3+3}\underline{G}_{(3)}$ this is the floral formula of liliaceae family.

32. When main axis terminates in a flower
(1) Acropetal arrangement of flowers is observed
(2) Flowers are arranged basipetally
(3) It is called Racemose inflorescence
(4) Both Flowers are arranged basipetally & it is called Racemose inflorescence

Sol.[2] In racemose types of inflorescence, the main axis grows continuously and flowers are present laterally on the floral axis. While in the cymose type of inflorescence, the main axis does not grow continuously. Flowers are arranged basipetally on the main axis.

33. Leaf base in some leguminous plants may become swollen to form _____ which helps in sleep movements
(1) Petiole
(2) Pulvinus
(3) Leaf blade
(4) Ligule

Sol.[2] an enlarged section at the base of a leaf stalk in some plants, which is subject to changes of rigidity leading to movements of the leaf or leaflet example in leguminoaceae family.

34. Petiole in _____ expands, becomes green and synthesizes food
(1) *Smilax*
(2) *Pisum*
(3) *Opuntia*

(4) Australian *Acacia*

Sol.[4] Phyllode is a modified petiole or shoots connecting stem and leaf. Examples of Phyllode include Acacia.

35. In pinnately compound leaf, a number of leaflets are present on a common axis which represents
    (1) Petiole
    (2) Midrib of the leaf
    (3) Peduncle
    (4) Leaf lamina

    Sol.[2] In a pinnately compound leaf, the middle vein is called the midrib. Mid rib represents rachis.

36. Underground stems of some plants spread to new niches and when older parts die new plants are formed. Examples of these plants are
    (1) Strawberry and *Bougainvillea*
    (2) *Zaminkand* and grasses
    (3) *Opuntia* and *Euphorbia*
    (4) Grasses and strawberry

    Sol.[4] some underground stems **like** sucker and runner spread to new niches and when older parts die new plants are formed.

37. Stem tendrils are spirally coiled, slender structures which help the plants to climb up on a support. They are not found in
    (1) Cucumber
    (2) *Citrus*
    (3) Pumpkin
    (4) Watermelon

    Sol.[2] Tendril is a modified stem, leaf, or petiole. Tendrils support the plant as it climbs up a structure, allow a plant find a more suitable area to grow due to more light. They are absent in citrus.

38. Select odd one out w.r.t. non-endospermous seed
    (1) Bean
    (2) Gram
    (3) Castor
    (4) Pea

    Sol.[3] Non-endospermic seeds do not have an endosperm in the mature seed. The cotyledons are thick and fleshy, and function as the sole food storage organs. Dicot plants have non-endospermic seeds. Exception is castor plant.

39. Fleshy, fibrous and edible mesocarp is present in
    (1) Mango

(2) Coconut
(3) Walnut
(4) Arecanut

Sol.[1] Mango and coconut are drupe fruits. They develop from monocarpellary superior ovaries and are one seeded. It is differentiated into outer thin epicarp, middle fleshy mesocarp and inner stony endocarp.

40. Stilt roots
(1) Arise from horizontally placed aerial branches
(2) Develop from the basal node of the stem
(3) Are hygroscopic
(4) Act like pillars and provide support to aerial branches

Sol.[2] Stilt roots are adventitious aerial roots that grow obliquely downward from the main stem's basal nodes and attach firmly to the soil.

41. Placentation in which number of placenta corresponds to the number of carpels is
(1) Axile
(2) Superficial
(3) Free central
(4) Parietal

Sol.[4] When the ovules develop on the inner walls of the ovary, the ovary is said to have parietal placentation.

42. Both cohesion and adhesion of stamens is found in
(1) Asteraceae
(2) Fabaceae
(3) Brassicaceae
(4) Solanaceae

Sol.[1]

43. A basket is with *Asparagus*, *Aloe vera*, *Atropa belladona*, *Helianthus annuus* and *Colchicum autumnale*. To how many families do these members belong?
(1) One
(2) Two
(3) Three
(4) Four

Sol.[3] Liliaceae includes *Colchicum autumnale, Asparagus, Aloe vera* while astaraceae includes *Helianthus* and Solanaceae includes *Atropa belladonna.*

44. In Australian *Acacia*, petiole is modified into leaf like sickle shaped structure known as
(1) Phyllode

(2) Phylloclade
(3) Cladode
(4) Hypsophyll

Sol.[1] Phyllodes are modified petiole, which are leaf-like in appearance and function.

45. Find the odd one w.r.t. stem tendrils which develop from axillary buds
(1) Cucumber
(2) Pumpkin
(3) Watermelon
(4) Citrus

Sol.[4] Tendril is a modified stem, leaf, or petiole. Tendrils support the plant as it climbs up a structure, allow a plant find a more suitable area to grow due to more light. They are absent in citrus.

46. Which is the correct floral formula of Brassicaceae?
(1) $\oplus \female K_{2+2}\ C_5\ A_{5+5}\ \underline{G_{(2)}}$
(2) $\oplus \female K_{2+2}\ C_{\times 4}\ A_{2+4}\ \underline{G_{(2)}}$
(3) $\oplus \female K_4\ C_{\times 4}\ A_4\ \underline{G_{(2)}}$
(4) $\oplus \female K_4\ C_{\times 4}\ A_{2+2}\ \underline{G_{(2)}}$

Sol.[2] $\oplus \female K_{2+2}\ C_{\times 4}\ A_{2+4}\ \underline{G_{(2)}}$ brassicaceae includes actinomorphic, bisexual, polysepalous, polypetalous, teradinamous condition and superior ovaries.

47. In mango and coconut, fruit is developed from
(1) Monocarpellary inferior ovaries
(2) Bicarpellary superior ovaries
(3) Monocarpellary superior ovaries
(4) Bicarpellary inferior ovaries

Sol.[3] Mango and coconut are drupe fruits. They develop from monocarpellary superior ovaries and are one seeded. It is differentiated into outer thin epicarp, middle fleshy mesocarp and inner stony endocarp.

48. Find out one (w.r.t. symmetry of flower)
(1) Mustard
(2) Chilli
(3) *Datura*
(4) Canna

Sol.[4] In canna the flowers are asymmetric and composed of three sepals and three petals that are small, inconspicuous and hidden under extravagant stamens.

49. In *Monstera* and the banyan tree, roots arise from parts of plant other than radicle and are called
    (1) Fibrous root system
    (2) Adventitious roots
    (3) Lateral roots
    (4) Tertiary roots

    Sol.[2] Some roots, called adventitious roots, arise from an organ other than the root—usually a stem, sometimes a leaf.

50. A thick vertical underground stem having more diameter than length is
    (1) Sucker
    (2) Bulb
    (3) Corm
    (4) Rhizome

    Sol.[3] corm is a rounded underground storage organ present in plants such as crocuses, consisting of a swollen stem base covered with scale leaves.

51. Axile placentation is found in
    (1) Liliaceae
    (2) Malvaceae
    (3) Solanaceae
    (4) All of these

    Sol.[4] Axile placentation is found in Liliaceae, Malvaceae and Solanceae family.

52. Which of the following plants has swollen placenta?
    (1) *Malva*
    (2) *Datura*
    (3) *Raphanus*
    (4) None of these

    Sol.[2] Solanaceae is an economically important family of flowering plants. In Solanaceae, the placenta is swollen and the oblique septum is present.

53. Phylloclade
    (1) Is a modified root
    (2) Serves as photosynthetic and storage organ
    (3) Is an irregular, dry scaly structure
    (4) Lack nodes and internodes

Sol.[2] The typical flattened photosynthetic organ of a vascular plant is the leaf, but some plant groups instead have flattened green stems as the chief photosynthetic organs called as phylloclade.

54. Part of fleshy tap root which stores the food in radish is
    (1) Primary root
    (2) Primary root, Hypocotyl
    (3) Primary and Secondary roots
    (4) Primary root and Epicotyl

Sol.[2] Storage roots, such as carrots and radsdish, are examples of roots that are specially modified for storage of starch and water. They usually grow underground as protection from plant-eating animals.

55. Fruit in wheat is
    (1) Cremocarp
    (2) Caryopsis
    (3) Pseudocarp
    (4) Parthenocarp

Sol.[2] In graminae caryopsis is a type of simple dry fruit—one that is monocarpellate (formed from a single carpel) and indehiscent (not opening at maturity) and resembles an achene, except that in a caryopsis the pericarp is fused with the thin seed coat.

56. Find correct match w.r.t. types of fruits.

Column-I	**Column-II**
a. Brassicaceae	(i) Cypsela
b. Lamiaceae	(ii) Siliqua
c. Cucurbitaceae	(iii) Carcerulus
d. Asteraceae	(iv) Pepo

    (1) a (ii), b (iii), c (iv), d (i)
    (2) a (ii), b (iii), c (i), d (iv)
    (3) a (iv), b (iii), c (ii), d (i)
    (4) a (i), b (iii), c (iv), d (ii)

Sol.[1] A Cypsela is a single-seeded dry indehiscent fruit that develops from a one part inferior ovary and a fleshy, several-seeded fruit that has developed from one flower having a single ovary divided into several carpels, which develops a firm or tough rind as it matures (such as a melon, squash, cucumber).

57. Diadelphous androecium possessing family also shows
    (1) Actinomorphic flowers
    (2) Epigynous flowers
    (3) Tetramerous flowers with superior ovary
    (4) Zygomorphic and perigynous flowers

Sol.[4] Fabaceae family includes Zygomorphic and perigynous flowers as well as Diadelphous condition.

58. Match the following

a. Pseudocarp	(i) *Cocos nucifera*
b. Parthenocarp	(ii) *Phoenis dactylifera*
c. Edible pericarp	(iii) *Pyrus malus*
d. Edible endosperm	(iv) *Musa*

(1) a(iv), b(iii), c(ii), d(i)
(2) a(i), b(ii), c(iv), d(iii)
(3) a(iii), b(iv), c(ii), d(i)
(4) a(iii), b(i), c(ii), d(iv)

Sol.[3]

59. Correct matching is-

a. Pseudocarp	(i) *Pyrus malus*(apple)
b. Parthenocarp	(ii) *Musa*(banana)
c. Edible pericarp	(iii) *Phoenis dactylifera*(date palm)
d. Edible endosperm	(iv) *Cocos nucifera*(coconut)

60. Match the following

Column-I	**Column-II**
a. Tendril in *Clematis*	(i) Stipule
b. Tendril in *Smilax*	(ii) Petiole
c. Tendril in *Vitis*	(iii) Leaflet
d. Tendril in *Pisum*	(iv) Axillary bud

(1) a (i), b (ii), c (iii), d (iv)
(2) a (ii), b (i), c (iv), d (iii)
(3) a (i), b (iii), c (iv), d (iii)
(4) a (ii), b (iii), c (i), d (iv)

Sol.[2]

61. Correct matching is-

Column-I	**Column-II**
a. Tendril in *Clematis*	(i) Petiole
b. Tendril in *Smilax*	(ii) Stipule
c. Tendril in *Vitis*	(iii) Axillary bud
d. Tendril in *Pisum*	(iv) Leaflet

62. Stilt roots are found in
(1) Maize, *Ficus*
(2) *Bombax*, *Sorghum*
(3) *Pandanus*, *Sorghum*
(4) *Mirabilis*, *Ipomoea*

Sol.[3] Stilt roots are aerial adventitious **roots** which grow obliquely downwards from basal nodes of the main stem and fix firmly to the soil.

63. Tetradynamous condition of stamens is seen in
    (1) *Ocimum*
    (2) Mustard
    (3) *Salvia*
    (4) *Calotropis*

    Sol.[2] Tetradynamous condition of stamens is found in mustard (Brassica campestris) plant of family Cruciferae (Brassicaceae). In tetradynamous condition four stamens remain long and two short.

64. Which of these is **not** found in castor seed?
    (1) Endosperm
    (2) Caruncle
    (3) Perisperm
    (4) Chalazosperm

    Sol.[4] Non-endospermic seeds do not have an endosperm in the mature seed. The cotyledons are thick and fleshy, and function as the sole food storage organs. Dicot plants have non-endospermic seeds. Exception is castor plant.

65. Find out the **correct** one (w.r.t. edible part of fruit)

Column-I	**Column-II**
a. Mango	(i) Fleshy thalamus
b. Litchi	(ii) Fleshy mesocarp
c. Apple	(iii) Mesocarp and endocarp
d. Banana	(iv) Aril

    (1) a(iii), b(i), c(iv), d(ii)
    (2) a(i), b(ii), c(iii), d(iv)
    (3) a(iv), b(iii), c(i), d(ii)
    (4) a(ii), b(iv), c(i), d(iii)

    Sol.[4]

66. Correct matching is

Column-I	**Column-II**
a. Mango	(i) Fleshy mesocarp
b. Litchi	(ii) Aril
c. Apple	(iii) Fleshy thalamus
d. Banana	(iv) Mesocarp and endocarp

67. $C_{1+2+(2)}\ A_{1+(9)}$ represents the part of floral formula of family
    (1) Solanaceae
    (2) Poaceae
    (3) Brassicaceae
    (4) Fabaceae

    Sol.[4] Fabaceae contain paipillonaceous corolla and diadelphous condition.

68. Fleshy axis, bracts, fused perianth & pericarp are edible in the fruits of
    (1) Pineapple
    (2) Date palm
    (3) Okra
    (4) Strawberry

    Sol.[1] Pineapple is an inferior berry fruit develop grom multicarpellary syncarpous ovary having seeds embedded in fleshy part and thin epicarp.

69. Which of the following represents the modification of stem for photosynthetic purpose?
    (1) Bulbil, corm
    (2) Sucker, rhizome
    (3) Phyllode, cladophyll
    (4) Phylloclade, cladode

    Sol.[4] "phylloclade" to refer a portion of a leaf-like stem or branch with multiple nodes and internodes, and "cladode" for a single internode of a phylloclade.

70. Which of the following root shows napiform type of root modification?
    (1) Turnip
    (2) *Ipomoea*
    (3) Carrot
    (4) *Momordica*

    Sol.[1] Turnip contain napiform type tap root while carrot contain conical shape tap root.

71. Swollen spongy petiole is present in
    (1) *Hydrilla*
    (2) *Eichhornia*
    (3) *Vallisneria*
    (4) *Jasmine*

    Sol.[2] Eichhornia is a free-floating aquatic plant. The petiole bears a large membranous stipule, which forms a sheath around the next younger leaf. Petioles are spongy and form a bulbous float containing air-filled lacunate tissue.

72. Androecium in Brassicaceae family is
    (1) Didynamous
    (2) Tetradynamous
    (3) Synandrous
    (4) Syngenesious

    Sol.[2] In Cruciferae or Brassicaceae, the androecium has 6 stamens that show tetradynamous condition. The stamens are arranged in two whorls. The outer whorl has short stamens while the inner whorl has long stamens.

73. A culm is a
    (1) Unbranched stem showing distinct solid nodes and hollow internodes
    (2) Branched stem showing distinct solid nodes and hollow internodes
    (3) Unbranched stem showing distinct solid nodes and solid internodes
    (4) Branched stem showing distinct solid nodes and solid internodes

    Sol.[1] Bamboo is characterized by a jointed stem called a culm having solid nodes and hollow internodes.

74. Select an **incorrect** statement regarding umbel inflorescence
    (1) Flowers are pedicellate
    (2) Only one type of flowers are produced
    (3) Individual flowers are surrounded by involucre of bracts
    (4) Individual flowers are well spaced out

    Sol.[3] The pedicels are sometimes called the rays of the umbel and the bracts, when brought into a cluster or circle, form an involucre.

75. Endospermic seeds are produced
    (1) Only in gymnosperms
    (2) Only in monocots
    (3) Both gymnosperms and many monocots and also some dicots
    (4) Only in monocots and some dicots

    Sol.[3] In most monocot, Gymnos and some dicot seeds, the food reserve remains in the endosperm. They are called endospermic or albuminous seeds, e.g., cereals, castor, bean.

76. Food is stored in the apical part of adventitious root in
    (1) Nodulated root
    (2) Nodulose root
    (3) Fasciculated root
    (4) Moniliform root

    Sol.[2] Nodulose roots : These roots become swollen at their tips due to accumulation of food e.g., Curcuma amada (Mango – ginger).

77. Petiole is modified into tendrils in
    (1) *Clematis*
    (2) *Acacia*
    (3) *Eichhornia*
    (4) *Smilax*

    Sol.[1] In *Lathyrus aphaca,* the entire leaf is modified into tendril. In *Pisum sativum,* the upper leaflets modified into tendrils. In *Gloriosa,* the leaf tip modified into tendril. In *Clematis*, the petiole is modified into tendril. In *Smilax,* the stipule is modified into tendril.

78. When flowers arise from one lateral side of inflorescence axis alternately forming the zig-zag axis. This type of inflorescence in called
    (1) Helicoid cyme
    (2) Biparous cyme
    (3) Scorpioid cyme
    (4) Spadix

    Sol.[3] Scorpioid Cyme: When the lateral branches develop on alternate sides, forming a zigzag, the cymose inflorescence is known as scorpioid or alternate-sided cyme, e.g., in Gossypium (cotton), Heliotropium

79. Epiphyllous roots are observed in which of the following?
    (1) *Bryophyllum*
    (2) *Zingiber*
    (3) *Colchicum*
    (4) *Pothos*

    Sol.[1] The roots which arise from the leaf are epiphyllous. These roots have the ability to develop into new plants from leaves that fall to the ground in *Bryophyllum.*

80. In which of the following inflorescence fleshy receptacle forms a hollow cavity with an apical opening and flowers are developed on inner wall of the hollow cavity?
    (1) Cyathium
    (2) Capitate
    (3) Hypanthodium
    (4) Verticillaster

    Sol.[3] Hypanthodium inflorescence is characterized by the floral axis being fleshy and closed forming a pear shaped receptacle. Flowers are unisexual in cymose clusters.

81. Choose the correct option for spines
    (1) Leaf or stem modification, woody, nonvascular
    (2) Stem modification, vascular, woody
    (3) Leaf modification, vascular, deeply seated
    (4) Superficial outgrowth, nonvascular, ephemeral

    Sol.[3] spines are modified leaves that have vascular supply and deeply seated found in cactii.

82. Choose the odd one out w.r.t. flower symmetry
    (1) Mustard
    (2) Chilli
    (3) *Datura*
    (4) *Cassia*

    Sol.[4] Mustard, Datura and chilli have actinomorphic symmetry wile cassia has zygomorphic symmetry.

83. Consider the following four statements A, B, C and D and select the right option for two correct statements:
(A) In vexillary aestivation, the large posterior petal is called - *standard*, two lateral ones are *wings* and two small anterior petals are termed *keel*.
(B) The floral formula for Liliaceae is $\oplus \male\female P_{3+3}A_{3+3}\underline{G}_{(3)}$
(C) In Pea flower the stamen are monadelphous
(D) The floral formula for Solanaceae is $\oplus \male\female K_{(3)}C_{(3)}A_{(4)}\underline{G}_{(2)}$
The correct statements are:-

(1) (A) and (B)
(2) (B) and (C)
(3) (C) and (D)
(4) (A) and (C)

Sol.[1] Pea flowers having diadulphous stamens and $\oplus \male\female K_{(5)}\overset{\frown}{C}_{(5)}\overset{\frown}{A}_{(5)}\underline{G}_{(2)}$ is the correct floral formula of solanaceae.

84. Read the following statements carefully:-
(a) Alternate type of phyllotaxy is found in china rose, mustard and sunflower plants
(b) Opposite type of phyllotaxy is found in *Calotropis* and guava plants
(c) Whorled type of phyllotaxy is found in *Alstonia* plant
(d) Palmately compound leaves are found in neem plant
(e) In opposite type of phyllotaxy a single leaf arises at each node in alternative manner
Select the correct and incorrect statement(s) from the above statements:-
(1) a, b, c and d–correct,e - incorrect
(2) a, d and e - correct, b & c - incorrect
(3) a, b and c – correct, d & e - incorrect
(4) a, b, c and e – correct, d – incorrect

Sol.[3] Pinnately compound leaves are found in neem plant and in opposite type of phyllotaxy two leaves arises at each node in alternative manner.

85. Consider the following four statements A, B, C & D. Select the right option for two correct statements.
Statements:
A. Scutellum observed in a grain of wheat or maize is comparable to endosperm of the seed in other monocotyledons.
B. A fruit develops from hypanthodium inflorescence is called syconus.
C. An example of seed with endosperm, perisperm & caruncle is castor.
D. The floral formula of sun hemp five fused corolla.

The correct statements are:-

(1) A & B
(2) B & C
(3) C & D
(4) A & C

Sol.[2] Sun hemp is the member of fabaceae and fabaceae mambers have corolla in polypetalous condition and scutellum in monocot seed is the shield shaped cotyledon.

86. Find incorrect match:-
    (1) *Capsicum*, Tomato – Solanaceae
    (2) *Allium cepa* (onion) – Liliaceae
    (3) *Aloe vera*, Garlic – Fabaceae
    (4) Pea, Bean, Gram – Fabaceae

    Sol.[3] *Aloe vera*, Garlic are members of Liliaceae family.

87. Character shown by members of Fabaceae (Pea, Bean) is:-
    (1) Ovary with marginal placentation
    (2) False septum
    (3) Swollen placenta
    (4) Presence of perianth

    Sol.[1] Fabaceae have marginal placentation while Solanaceae have swollen placenta in ovary.

88. A flower having many free carpels will develop into:-
    (1) Schizocarpic fruit
    (2) Sorosis
    (3) Simple fruit
    (4) Etaerio

    Sol.[4] A fruit formed from several carpels derived from the same flower, e.g. a raspberry is aggregate/Etario fruit.

89. Fruit in liliaceae is:-
    (1) Drupe
    (2) Capsule
    (3) Legume
    (4) Siliqua

    Sol. [2] Capsule or rarely berry type fruit found in Liliaceae.

90. Monoadelphous condition is present in:-
    (1) China rose
    (2) Pea
    (3) Citrus
    (4) Mustard

    Sol. [1] When the stamens are united into one bunch or one bundle it's called Monadelphous stamens present in malvaceae

91. *Sesbania* belongs to family:-
    (1) Liliaceae
    (2) Fabaceae
    (3) Solanaceae
    (4) Compositae

    Sol. [2] Fabaceae, which is the third largest family among the angiosperms after Orchidaceae (orchid family) and Asteraceae (aster family), consists of more than 700 genera and about 20,000 species of trees, shrubs, vines, and herbs and is worldwide in distribution.

92. Imbricate aestivation is present in
    (1) *Calotropis*
    (2) Chinarose
    (3) *Cassia*
    (4) Cotton

    Sol. [3] in imbricate aestivation the members of a whorl are not present in a regular manner for example cassia and gulmohar.

93. Which of the following is false fruit?
    (1) Apple
    (2) Cashewnut
    (3) Strawberry
    (4) All of the above

    Sol. [4] A fruit formed from other parts of the plant as well as the ovary, especially the receptacle, such as the strawberry or fig.

94. Fruit in solanaceae is:-
    (1) Capsule, rarely berry
    (2) Berry or capsule
    (3) Legume
    (4) Drupe

Sol. [2] Fruits including tomatoes, eggplant, bell peppers and chili, all of which are closely related members of the Solanaceae are berry fruits while datura have capsule type fruit.

95. **Assertion**: Bract is reduced leaf found at the base of the pedicel.

Reason: Flowers with bracts are called ebracteate and those without bracts, abracteate.

(1) Both Assertion and Reason are correct and Reason is the correct explanation of Assertion.
(2) Both Assertion and Reason are correct but Reason is not the correct explanation of Assertion.
(3) Assertion is correct but Reason is incorrect.
(4) Both Assertion and Reason are incorrect.

Sol.[3] Flowers with bracts are called bracteate and those without bracts, ebracteate and genrally a single bract is present at base of pedicel of flower.

96. The standard petal of a papilionaceous corolla is also called.
(1) Carina
(2) Pappus
(3) Vexillum
(4) Corona

Sol. [3]: The standard petal of a papilionaceous corolla is also called Vexillum, and vaxillum overlaps 2 wings and wings overlap keel or carina.

97. Which of the following is not a stem modification?
(1) Pitcher of *Nepenthes*
(2) Thorns of citrus
(3) Tendrils of cucumber
(4) Flattened structures of *Opuntia*

Sol. [1] : Pitcher of *Nepenthes* is not a stem modification it is leaf modification in which petiole modified into tendril and leaf lamina modified into pitcher.

98. Stems modified into flat green organs performing the functions of leaves are known as:
(1) Cladodes
(2) Phyllodes
(3) Phylloclades
(4) Scales

Sol. [3]: Stems modified into flat green organs performing the functions of leaves are known as Phylloclades while phyllode is a modified petiole and cladode is one to two internode long stem.

99. The term ' polyadelphous' is related to:
    (1) calyx
    (2) gynoecium
    (3) androecium
    (4) corolla

Sol. [3]: The term ' polyadelphous' is related to androecium in which the stamens attach in more then two bundle for example citrus.