Biology
Classified MCQ
Unit 4
2000 - 2020

Unit 4 – Plant form and function

Structure and functions of plant tissues.

(1) Which of the following statements is incorrect regarding collenchyma cells?
(2) They are living at maturity.
(3) They have primary cell walls only.
(4) They are capable of further cell division.
(5) They are found inboth primary and secondary plant bodies.
(6) They have unevenly thickened cell walls. (2000)

(2) Which of the following is and incorrect statement?
(1) In phloem sieve tubes, transport of sucrose may take place in both directions.
(2) Sucrose is the only organic substance transported in phloem.
(3) Sucrose is secreted into sieve tube elements of phloem by companion cells.
(4) ATP energy is used in phloem loading.
(5) Sieve tube elements are living cells although they do not have nuclei. (2006)

(3) Characteristics of two plant cells named P and Q are given below.
Cell P: Thick secondary cell wall, isodiametric, pits in cell wall, large lumen
Cell Q: Thick secondary cell wall, not isodiametric, no pits in cell wall, narrow lumen

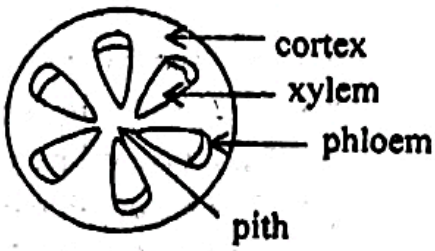
The cells P and Q are respectively
(1) a companion cell and a vessel element.
(2) a sieve tube element and a trachied.
(3) a vessel element and a sclerenchyma cell .
(4) a vessel element and a trachied.
(5) a trachied and a vessel element. (2018-13)

(4) Which of the following statements regarding the epidermis of plants is correct?
(1) It usually consists of several layers of cells.
(2) It is a permanent tissue.
(3) Root hairs are multicellular projections of epidermal cells.
(4) Trichomes are specialized epidermal cells.
(5) Deposition of suberin in epidermal cells prevents water loss. (2019-12)

(5) Collencyma cells differ from parenchyma cells because collenchyma cells
(1) are non-living when mature
(2) have a large central vacuole
(3) have unevenly thickened cell walls.
(4) are thickened with lignin
(5) are present in the vascular tissues of plants. (2020-13)

Growth and development of a plant

(1) The diagram given below represents a cross section of a part of a plant as seen under the low power of a microscope.



Which of the following statements is correct regarding the above diagram?
(1) It has vicollateral vascular cundles.
(2) It represents a transverse section of a dicot stem.
(3) Metaxylem of the vascular bundles is located towards the centre of the diagram.
(4) Tissues shown are primary and secondary in origin.
(5) It represents a transverse section of a monocot root. (2001)

(2) Interfascicular cambium in most dicotyledonous stems
(1) is a primary meristem
(2) is of secondary origin
(3) consists of several layers
(4) consist of parenchyma cells with large vacuoles
(5) produces secondary medullary rays (2004)

(3) Which of the following is/are not true regarding the structure of monocotyledonous stems?
(A) Well differentiated cortex and pith.
(B) Vascular bundles arranged in several rings.
(C) No cambium in vascular bundles.
(D) Protoxylem in the vascular bundle may break down to form a cavity.
(E) Vascular bundles enclosed by a ring of sclerenchyma cells. (2009)

(4) Which of the following is/are true about dicotyledonous stems after secondary thickening?
(A) All tissues outside the vascular cambium form the bark.
(B) Vascular cambium forms a ring of several layers of meristematic cells.
(C) Pith of the stem has disapeared.
(D) Cells of medullary rays transport substances radially in the stem.
(E) Sapwood as well as heart wood, transport water. (2009)

(5) Which of the following is incorrect regarding the root apex of monocotyledonous plants?
(1) Apical initials produce new cells in all directions.
(2) Root hairs differentiate in the zone of cell elongation.
(3) Protoxylem differentiates at the peripheral zone of procambium.
(4) Pith is differentiated from procambium.
(5) Cells of the root cap divide continuously. (2010)

(6) Sclerenchyma cells which are supporting cells in plants are normally located in which of the following region / regions of dicotyledonous plants?
(A) Cortex in primary stem
(B) Bundle sheath in leaves
(C) Xylem tissues
(D) Phloem tissues
(E) Pith (2014)

(7) The growth of which one of the following is responsible for continued growth and elongation of leaves of grass in a lawn, following mowing by machine or grazing by animals?

(1) Apical meristem (2) Lateral meristem (3) Intercalary meristem
(4) Axillary buds (5) Interfascicular cambium (2015)

(8) All features given in which one of the following responses are present in a plant with trimerous flower parts?

(1) Parallel veins in leaves, embryos with one cotyledon, fibrous roots, branched lipids in cell membrane
(2) Seeds in fruits, dominant sporophyte, several kinds of RNA polymerases, scattered vascular bundles in stem.
(3) Embryos with one cotyladon, photosynthetic gametophyte, vascular bundles in the stem without cambia, unbranched lipids in cell membrane
(4) Parallel veins in leaves, heterospory, fibrous roots, protein synthesis that begins with formyl methionine.
(5) Scattered vascular bundles in stem, perianth, naked seeds, unbranched lipids in cell membrane (2018-6)

(9) Select the correct statement regarding the adaptations of plants for efficient photosynthesis.

(1) Plants are branched in a pattern that is suitable to absorb the maximum amount of carbon dioxide from atmosphere.
(2) Large leaves are present in plants growing in dry environments to maximize light capture.
(3) Leaves of some plants are arranged almost vertically to get the maximum amount of light.
(4) Leaves of some plants are arranged horizontally to avoid damage by over intense light.
(5) Plants grow tall to avoid shading by neighbouring plants. (2019-13)

(10) Shoot apical meristem

(1) increases height and diameter of stem
(2) produces cells inwards and outwards
(3) is composed of parenchyma cells.
(4) is composed of undiffentiated cells.
(5) contributes to primary and secondary growth of stem. (2020-14)

Transport

Process of gaseous exchange in plants.

(1) Which of the following is correct regarding plant – water relationships?
(1) both entry of water into a plant and loss of water by transpiration take place along a water potential gradient.
(2) Water movement across the symplast requires expenditure of metabolic energy.
(3) Water moves across the apoplast while solutes do not.
(4) Water movement across vacuolar pathway can take place against a concentration gradient.
(5) Guttation is an active process requiring metabolic energy. (2000)

(2) Which of the following statements is incorrect?
(1) Water potential of stomatal guard cells increases in the presence of sun light.
(2) Transport of potassium ions into guard cells, from adjoining epidermal cells helps to open the stomata in the presence of sun light.
(3) Pattern of cellulose thickenings in guard cells is involved in the mechanism of opening and closing of stomata.
(4) Stomata of plant leaves may close when the transpiration is excessive.
(5) In some plants, stomata are found mainly on the upper epidermis of leaf. (2006)

(3) Stomata open when plant leaves are exposed to light. Which of the following will not happen in guard cells, when stomata open?
(1) Starch is hydrolysed to sugar.
(2) Starch is synthesised from sugar.
(3) K^+ move into guard cells from other epidermal cells.
(4) Water potential of guard cells decreases.
(5) Pressure potential of guard cells increases. (2007)

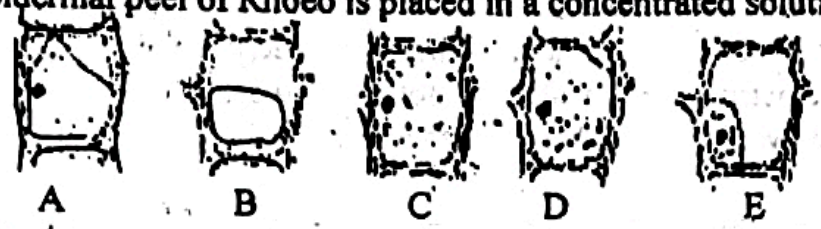
(4) Which of the following does not involve active transport across the cell membranes?
(1) The transport a mineral ions from apoplast to the symplast.
(2) The transport of sugar from leaf cells into sieve tube element of the phloem.
(3) The transport of sugar from one sieve tube element to the adjacent sieve tube element.
(4) K^+ uptake by guard cells in stomatal movements.
(5) The transport of mineral ions into the vascular pathway. (2014-16)

(5) Which of the following experimental conditions would reduce transpiration without affecting photosynthesis?
(1) Transferring the plant to dry soil.
(2) Increasing the level of CO_2 around the plant.
(3) Decreasing the relative humidity around the plant.
(4) Injecting K^+ into guard cells.
(5) Injecting ABA into guard cells. (2015)

(6) During the opening of stomata
(1) sodium ions are actively transported into guard cells.
(2) turgor pressure of guard cells reduces.
(3) carbon dioxide content in the substomatal cavity increases.
(4) water potential in guard cells decreases.
(5) potassium ions are passively transported into guard cells. (2019-14)

Concepts and processes involve in transport of water and minerals

(1) The following figures show various stages of changes that can be observed when coloured epidermal peel of Rhoeo is placed in a concentrated solution of sugar.



A B C D E

Which of the following indicates the correct sequence of various stages?

(1) C, A, D, E, B (2) E, B, A, D, C (3) E, B, C, A, D
(4) C, D, A, B, E (5) A, D, E, B, C (2000)

(2) Which of the following is not a part of the apoplast of a plant?

(1) Cell wall of a parenchyma cell. (2) Cavity of a xylem vessel.
(3) Cavity of a sieve tube. (4) Cell wall of guard cells.
(5) Cell wall of transfer cells. (2001)

(3) Which one of the following could be considered as a passive process?

(1) Movement of mineral ions from soil solution into vacuoles of root hair cells.
(2) Movement of sucrose from mesophyll cells into sieve tubes.
(3) Movement of sucrose from one sieve tube element to the next sieve tube elelment.
(4) Movement of K^+ ions from guard cells into epidermal cells.
(5) Movement of Na^+ ions from the golmerular filtrate through the wall of proximal convoluted tubule. (2001)

(4) When a piece of leaf epidermis as immersed in distilled water for thirty minutes the cells became fully turgid and attained equilibrium. Which one of the following statements is correct with regard to these cells in equilibrium?

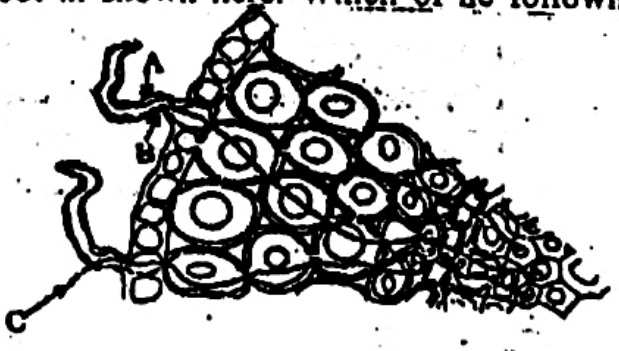
(1) Water potential and solute potential of the cell sap have equal and opposite values.
(2) Water potential and pressure potential of cell sap have equal values.
(3) Solute potential and pressure potential of cell sap have equal and ipposite values.
(4) Water potential of cell sap is less than water potential of distilled water.
(5) Solute potential of cell sap is more than the pressure potential of cell sap. (2001)

(5) Which one of the following factors can be considered as least important in the vertical transport of water through the xylem in a tall tree?

(1) Cohesive force (2) Transpiration pull (3) Adhesive force
(4) Water potential gradient (5) Root pressure (2003)

(6) A diagram of a cross-section of a root indicating the three major pathways (A, B, C) of horzontal water transport across the root in shown here. Which of he following represents the apoplast pathway.

(1) A, B, C
(2) A,. C, B
(3) B, C, A
(4) B, A, C
(5) C, B, A (2003)



(7) Which of the following statements regarding casparian strips of roots is incorrect?
(1) They can be seen only in younger plant roots.
(2) They do not affect the movement of water through symplast.
(3) They are found only in radial walls of endodermal cells.
(4) They are permeable to water but not for solutes.
(5) Their cell walls are thickened with suberin. (2005)

(8) Which of the following statements regarding water potential is incorrect?
(1) Soil water has a lower water potential than plant roots.
(2) Water potential increase with increasing temperature.
(3) At the stage of incipient plasmolysis water potential of a cell is equivalent to its solute potential.
(4) In osmosis water moves from higher water potential to a lower water potential.
(5) Water potential of atmosphere is less than that of mesophyll cells. (2005)

(9) When a plant cell is at the stage of incipient plasmolysis.
(1) its water potential is zero
(2) its solute potential is zero
(3) its pressure potential is zero
(4) its solute potential is greater than water potential
(5) its solute potential is less than water potential. (2006)

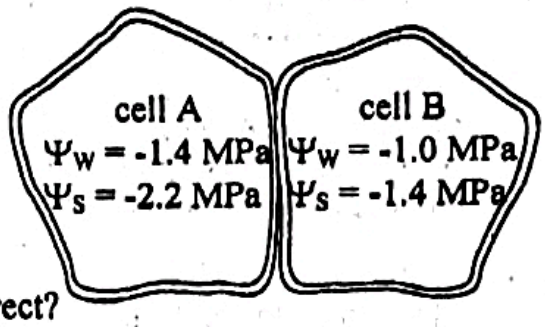
(10) Which of the following statements is incorrect?
(1) Water entering a root hair cell of a plant root may pass into a pericycle cell through apoplast.
(2) Both cell membrane and cell wall of cortical cells are fully permeable to water.
(3) Mineral ions of soil solution cannot enter symplast of root hair cell by simple diffusion.
(4) Root may absorv mineral ions against a concentration gradient.
(5) Enododermis provides a barrier for the passage fo solutes to xylem, from cortex. (2006)

(11) Which one of the following is not a part of the apolast of a plant?
(1) cell wall of root hair cells. (2) lumen of xylem vessels.
(3) lumen of phloem sieve tubes. (4) cell wall of mesophyll cells.
(5) intercellular spaces of root cortex. (2007)

(12) Which of the following is not caused by changes of water potential?
(1) Absorption of K^+ by root cells.
(2) Wilting of plant leaves in dry days.
(3) Sleep-movements of legume leaves in the evening.
(4) Opening of stomata in the morning.
(5) Transpiration through the cuticle of leaves. (2009)

(13) Which of the following processes does not involve active transport of material?
(1) Transport of soil mineral nutrients into plant root hair cells.
(2) Transport of K^+ into guard cells during stomatal movement.
(3) Transport of sugar from mesophyll cells of leaves into sieve tube cells.
(4) Transport of photosynthetic products from one sieve tube cell to another sieve tube cell.
(5) Transport of mineral nutrients through cell wall to the symplast. (2011)

(14) A and B are two plant cells adjecent to each other. The Ψ_W and Ψ_S value of the two cells are indecated in the diagram



Which one of the following statements is incorrect?
(1) Water will move from cell B to cell A.
(2) Movement of water will occur until Ψ_W of the two cells are equal
(3) Ψ_P of cell A is 1.0 MPa
(4) Ψ_P of cell B is 0.6 MPa
(5) The Ψ_W and Ψ_S values of normal plant cells are always negative. (2011)

(15) Which of the following substances are generally transported in the xylem?
(A) Nitrates (B) Water (C) Phosphates
(D) Vitamins (E) Auxins (2011)

(16) Which of the following statements is incorrect regarding water potential?
(1) Water potential of vacuolar solution in root hair cell is higher than that of soil solution.
(2) Pure water has highest water potential.
(3) Ascent of sap in the xylem takes place along a decreasing gradient of water potential.
(4) Cells of halphytic plants normally has a lower water potential.
(5) When transpiration takes place the water potential of outside air is lover than that of air inside the plant leaf. (2012)

(17) Which of the following is most likely to occur if a plant cell with a solute potential of – 0.3 MPa and a pressure potential of 0.2 MPa is placed in pure water?
(1) Water will move out of the cell.
(2) Water will move into the cell.
(3) Solutes will move out of the cell.
(4) There will be no net movement of water either into or out of the cell.
(5) Water may move into or out of the cell depending on the direction of the water potential gradient. (2015)

(18) Transport of water and minerals in plants
(1) occurs in both directions.
(2) is not aided by transpiration.
(3) is an active process.
(4) is explained by pressure flow hypothesis.
(5) occurs under a negative pressure gradient. (2018-12)

(19) Dissolving of solutes in water
(1) increases water potential and solute potential.
(2) decreases water potential and solute potential
(3) decreases water potential and increases solute potential.
(4) increases water potential and decreases solute potential.
(5) affects water potential and solute potential independent of each other. (2020-15)

(20) Osmosis
(1) occurs due to diffusion of water molecules through a permeable membrane.
(2) occurs from a low water potential to a high water potential.
(3) is an active process.
(4) is the mechanism by which water enters root hairs from soil.
(5) reduces pressure in the sieve tube at the source. (2020-16)

Processes involve in translocation of food in plants.

(1) Which of the following statements regarding the transport of organic food material in the phloem is/are incorrect?
(A) The food material transported is mainly glucose.
(B) Transport of food material through the sieve tubes of phloem requires metabolic energy.
(C) Transport of food material can occur in both directions within the phloem.
(D) Transport of food material is stopped when phloem is treated with respiratory inhibitors.
(E) The rate of transport of food material may vary within the day. (2000)

(2) Out of the following, which substance is chiefly conducted through the phloem?
(1) gases (2) water (3) synthesized food
(4) mineral salts (5) nitrogenous waste (2002)

(3) Which of the following is an incorrect statement?
(1) In phloem sieve tubes, transport of sucrose may take place in both directions.
(2) Sucrose is the only organic substance transported in phloem.
(3) Sucrose is secreted into sieve tube elements of phloem by companion cells.
(4) ATP energy is used in phloem loading.
(5) Sieve tube elements are living cells although they do not have nuclei. (2006)

(4) Which of the following helps least, in phloem translocation?
(1) Mitochondria in companion cells.
(2) Plasmodesmata between companion cells and sieve cells.
(3) Sieve plates of sieve tubes.
(4) Transpiration.
(5) Hydrostatic pressure in sieve tubes. (2008)

(5) Which statement regarding phloem, is incorrect?
(1) Loading sucrose into sieve tubes is done by transfer cells using respirtory energy.
(2) Osmosis is not an important factor for transport of phloem sap.
(3) Transport of phloem sap within sieve tubes can take place in both directions at different times.
(4) Sieve tube elements contain cytoplasm but no nuclei.
(5) Phloem also transports amino acids, growth substances and chemicals applied to plants, in addition to sucrose. (2009)

(6) Which of the following is not transported by phloem tissue in plants?
(1) Potassium ions (2) Phosphate ions (3) Vitamins
(4) Nitrate ions (5) Herbicides (2013)

Processes of water loss inplants.

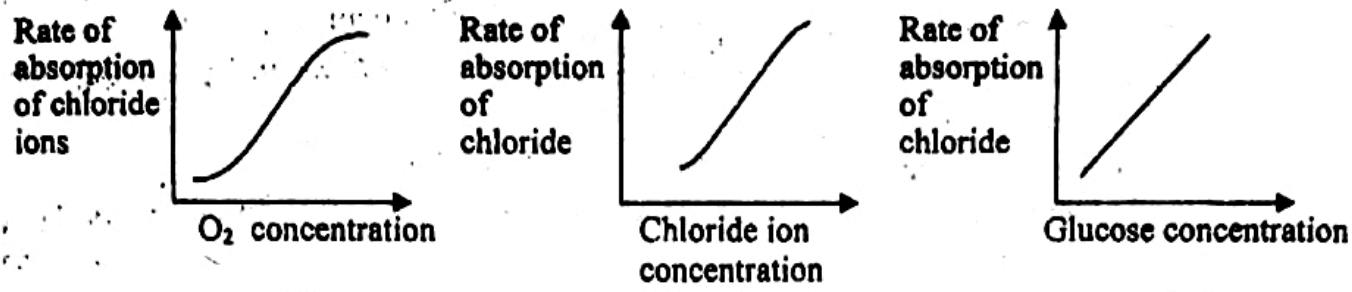
(1) Which one of the following situations contributes to the opening of stomata?
(1) When K^+ ions move out of guard cells into neighbouring cells.
(2) When water potential of guard cells decreases below that of neighbouring cells.
(3) When guard cells absorb water by active transport.
(4) When concentration of starch in guard cells increases.
(5) When humidity of the atmosphere increases rapidly. (2001)

(2) A major function of K^+ in a plant is seen in
(1) Stomatal movement (2) Chlorophyll synthesis
(3) Cell division (4) Electron transport chain
(5) Synthesis of vitamins (2003)

(3) Experiments to measure the rate of transpiration of plant shootsmay fail if the shoots are not cut under water. This is because.
(1) when shoots are cut in air, the xylem vessels get blocked-by exudates.
(2) transpiration cannot take place unless there is a continuous column of water in the xylem.
(3) when shoots are cut in air, the stomata are closed and transpiration is restricted.
(4) when air enters the xylem vessels, the cohesive forces of water columns are lost.
(5) the amount of water lost in transpiration cannot be measured when shoots are cut in air. (2007)

(4) Which of the following is an incorrect statement?
(1) Stomata open when guard cells absorb K^+ ions from neighbouring cells.
(2) Guttation takes place when stomata are closed.
(3) Transpiration may take place through the cuticle.
(4) Rate of transpiration of a plant shoot can be estimated using a potometer.
(5) Transpiration helps the roots to absorb water. (2008)

(5) The graphs below show the effect of various factors on the rate of absorption of chloride ions by discs of carrot tissue from a solution in a flask.



(a) (b) (c)

Which of the above graphs support/supports the hypothesis that chloride ion absorption by carrot tissue involves.

1) a and b only 2) b and c only 3) a and c only
4) a, b and c 5) c only (2013)

(6) Which of the following processes in plants increases in the absence of light?

(1) Absorption of minerals (2) Absorption of water
(3) Ascent of sap (4) Elongation of internodes
(5) Guttation (2016-15)

(7) Which of the following factors least affects the rate of transpiration in plants?

(1) Humidity (2) Wind (3) Available water in soil for plants
(4) Light (5) Texture of soil (2017-14)

Nutrition

Modes of nutrition in organisms.

Nutritional requirements

(1) Which one of the following elements when absent will produce deficiency symptoms first in the mature parts of the plant?

(1) K (2) Mg (3) S (4) Cu (5) N (2003)

(2) Which fo the following terms best describes organisms, which fix atmospheric CO_2 and obtain energy from inorganic chemicals?

(1) chemoheterotrophs (2) chemotrophs
(3) chemoautotrophs (4) photoautotrophs
(5) photoheterotrophs (2006)

(3) Which one of the follo wing cannot be considered as an example for mutualism?

(1) Growth of epipytes on tree trunks.
(2) Algae and fungi forming lichens.
(3) Bacteria living in root nodules of legume plants.
(4) Mycorrhizae formed by fungi with roots of higher plants.
(5) Rhizozphera bacteria living on root surfaces of higher plants. (2007)

(4) Deficiency of which one of the elements does not cause chlorosis?
(1) K (2) Ca (3) Mg (4) Fe (5) N (2007)

(5) Which statement regarding nutrition of plants, is incorrect?
(1) Deficiency of nitrogen causes chlorosis.
(2) Magnesium is necessary for the formation of chlorophyll.
(3) Calcium helps in maintaining osmotic balance of cells.
(4) Sulphur helps in the formation of some co-enzymes.
(5) Phosphorous is transported from older leaves to younger ones. (2009)

(6) Which of the following statements is/are correct regarding essential elements in plants?
(A) They are components of the structural material in plants.
(B) Plants cannot complete the life cycles without these nutrients.
(C) Plants show deficiency sysmptoms when some of the essential elements are in short supply.
(D) Atmosphere is the major reservoir of essential elements.
(E) All essential elements are macronutrient elements. (2011)

(7) Which of the following is **incorrect** regarding insectivorous plants?
(1) They are photoautotrophic.
(2) They are saprophytic.
(3) They obtain nitrogen by digesting insects.
(4) Some of them are aquatic.
(5) They often grow in soils that do not have sufficient amount of nitrogen. (2015)

(8) Which of the following "Nutrition type – Example" combinations is/are correct?
(A) Symbiotic – *Cuscuta*
(B) Saprophytic – *Mucor*
(C) Chemoautotrophic – *Nitrobactor*
(D) Holozoic – *Drosera* (2016-44)

(9) Select the correct statement regarding nutritional requirements of plants.
(1) Iron is a macronutrient required by plants
(2) Deficiency of sulphur can be identified by chlorosis of older leaves.
(3) Magnesium is a component of carotenoids.
(4) Deficiency of nitrogen causes chlorosis mainly in young leaves.
(5) Molybdenum is required for nitrogen metabolism. (2019-16)

(10) Which of the following statements regarding the responses of plants to light is correct?
(1) There are two major classes of photoreceptors in plants.
(2) Blue light photoreceptors regulate seed germination.
(3) Exposure to direct sunlight stimulates vertical growth.
(4) Green and red are the most important colours of light for regulating photomorphogenesis.
(5) Positive phototropism occurs due to faster elongation of cells in the brighter side of the shoot. (2019-17)

(11) Chlorosis in older leaves may be caused due to deficiency of which of the following elements?
(1) Mg and S (2) N and P (3) Cl and Fe (4) Mn and Zn (5) Mo and Ni
(2020-17)

Reproductive process in plant
Adaptations of plants for terrestrial life

(1) Which of the following statements is/are incorrect regarding *Nephrolepis*?
(A) Plant body is differentiated into roots, stem and leaves.
(B) Possesses multicellular reproductive structures.
(C) No thallus phase is present in the life cycle.
(D) Show heterospory.
(E) Vascular tissues are present. (2000)

(2) Which of the following is incorrect regarding both *Selaginella* and *Cycas*?
(1) Male gametes are motile.
(2) Female gametophyte produces several archegonia.
(3) Megaspore produces one female gametophyte.
(4) Embryo is nutritionally supported by female gametophyte.
(5) Sporophytes are dioecious. (2001)

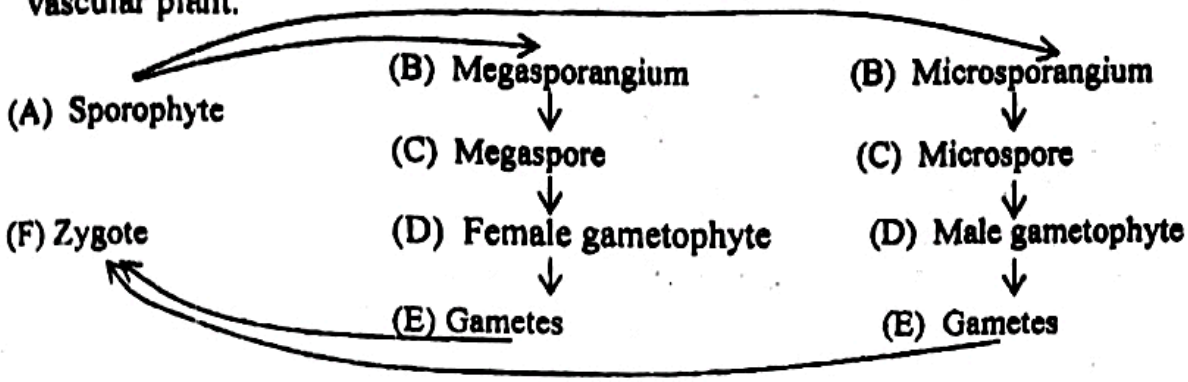
(3) Which one of the following features is absent in the life-cycle of angiosperms?
(1) An alternation between haploid and diploid generations.
(2) Development of microspores and megaspores.
(3) Dominant sporophytic generation.
(4) A reduced gametophytic generation.
(5) Meiosis occurring during gamete formation. (2002)

(4) In *Poganatum*,
(1) The sporophyte is totally dependant on the gametophyte.
(2) Gametophyte is dioecious.
(3) Two types of spores are formed.
(4) Male gametes are biflagellate.
(5) Spores germinate while still within the sporangium, before their release. (2002)

(5) What is/are the feature/s that can be seen in *Nephrolepis* but not in *Poganatum*?
(A) Well developed vascular tissue. (B) Independent gametophyte.
(C) Independent sporophyte. (D) Haploid spores.
(E) Motile reproductive cells. (2002)

(6) Which one of the following is seen only in angiosperms?
(1) Development of an embryo in the life cycle.
(2) Presence of seeds.
(3) Presence of heteromorphic alterntion of generation in the life cycel.
(4) Presence of double fertilization in the life cycle.
(5) Presence of xylem and phloem in the vascular system. (2003)

• Question 7 and 8 are based on the following chart of the life cycle of a heterosporous vascular plant.



(7) Which of the following plants show life cycles represented by the above chart?
(1) *Nephrolepis* and *Poganatum* (2) *Selaginella* and *Nephrolepis*
(3) Angiosperms and *Cycas* (4) *Nephrolepis* and angiosperms
(5) *Selaginella* and *Poganatum* (2003)

(8) The haploid generation in the above life cycle represented by stages.
(1) A, B and C (2) B, C and D (3) C, D and E
(4) D, E and F (5) E, F and A (2003)

(9) Which of the following features cannot be seen in Bryophytes?
(A) Heteromophic alternation of generation. (B) Independent sporophyte.
(C) Flagellated reproductive structures. (D) Heterospory.
(D) Reproductive structures with sterile cells. (2003)

(10) Plants which show heteromorphic alternation of generations always
(1) have independent gametophytes and independent sporophytes.
(2) have morphologically dissimilar gametophytes and sporophytes.
(3) have sporophytes which are more differentiated than gametophytes.
(4) have sporophytes which are less differentiated than gametophytes.
(5) have small gametophytes and large sporophytes. (2004)

(11) Which one of following features distinguishes mosses from ferns?
(1) Presence of nutritionally independent gametophytes.
(2) Presence of alternation of generations in the life cycle.
(3) Requirement of water for fertilization.
(4) Lack of a well developed vascular system.
(5) Absence of heterospory. (2004)

(12) Which of the following statements regarding life cycle of plants in incorrect?
(1) *Poganatum* has unisexual gametophytes.
(2) *Neprolepis* spores are dispersed by water.
(3) *Selaginella* produce two types of sporangia.
(4) *Cycas* produce seeds without fruits.
(5) *Selaginella* gametophyte grows inside spore wall. (2005)

(13) Which of the following statements regarding a comparison of the ovules of *Cycas* angiosperms is incorrect?
(1) *Cycas* ovule has archegonia but angiosperm ovule does not.
(2) *Cycas* ovule has a pollen chamber but angiosperm ovule does not.
(3) Angiosperm ovule has one embryo sac while *Cycas* ovule has several embryo sacs.

(4) Angiosperm ovule has only one egg cell while *Cycas* ovule has several eg cells.
(5) Angiosperm ovule has a funiculus but *Cycas* ovule does not. (2007)

(14) Which is the incorrect statement regarding a comparison of life cycles of *Nephrolepis* and *Selaginella*?
(1) *Nephrolepis* produces sori but *Selaginella* does not.
(2) *Nephrolepis* produces one type of gametophyte while *Selaginella* produces two types of gametophytes.
(3) Gametophytes of *Nephrolepis* are photosynthetic but those of *Selaginella* are not.
(4) Anthrozoids of *Nephrolepis* are multiflagellate while those of *Selaginella* are biflagellate.
(5) Gametophytes of *Nephrolepis* produce many antheridia while those of *Selaginella* produce only a single antheridium. (2007)

(15) Which of the following comparisons regarding *Poganatum* and *Nephrolepis* is incorrect?

	Poganatum	*Nephrolepis*
(1)	Sporophyte is not differentiated into stem, root and leaves.	Sporophyte is differentiated into stem, root and leaves.
(2)	Gametophyte is bisexual.	Gametophyte is bisexual.
(3)	Male gametes are biflagellate.	Male gametes are multiflagellate.
(4)	Sporangia are not produced in groups.	Sporangia are produced in groups.
(5)	Zygote does not produce and embryo.	Zygote produces an embryo.

(2008)

(16) Which of the following statements is incorrect regarding *Cycas* ?
(1) Sporophytes are unisexual.
(2) Megasporangium produces several female gametophytes.
(3) Microsporangia open by annulus.
(4) Pollen tube is nourished by nucellus.
(5) Male gametes are multicilliate. (2008)

(17) Which of the following features of *Nephrolepis* does not indicate that it is adapted to land habit better than Bryophytes?
(1) Gametophyte is a short lived generation in the life cycle.
(2) Gametophyte produces multi-flagellate male gametes.
(3) Sporophyte is differentiated into stems, leaves and roots.
(4) Sporophyte propagates asexully.
(5) Sporangia tare covered by an indusium. (2010)

(18) Diploid stage of the life cycle is shortest in
(1) *Poganatum* (2) *Nephrolepis* (3) *Selaginella*
(4) *Cycas* (5) *Musa* (2011)

(19) Which of the following statements regarding *selaginella* is incorrect?
(1) Two types of sporangia are produced.
(2) A motile stage is present in the life cycle.
(3) Embryo has a dormant period.
(4) Sporangia are produced in a strobilus.
(5) Gametophyte is dioceous. (2012)

(20) In *Selaginella* , meiosis occurs during the formation of
(1) spores (2) gametophyte (3) gametes (4) sporophyte (5) embryo
(2013)

(21) Which one of the following features distinguishes *Nephrolepis* from *Pogonatum* ?
(1) Presence of well developed vascular system.
(2) Absence of heterospory
(3) Presence of alternation of generation in the life cycle.
(4) Requirement of external water for fertilization
(5) Nutritionally independent sporyphyte (2013)

(22) Which one of the following features of the life cycles of gymnosperms and angiosperms does not help to distinguish them from other vascular plants?
(6) The presence of alternation of generations.
(7) The presence of ovules
(8) The presence of integuments
(9) The production of pollen.
(10) The presence of a dependent gametophyte (2014)

(23) Which of the following feature/features is/are not common to all phyla of vascular plants?
(A) Development of seeds
(B) Alternation of generations
(C) Photosynthetic gametophyte
(D) Heterospory
(E) Dominant sporophyte (2016-49)

(24) Seedless vascular plants that do not bear flowers can be seen in which of the following phylum/phyla?
(A) Pterophyta (B) Lycophyta (C) Coniferophyta
(D) Cycadophyta (E) Bryophyta (2017-41)

(25) A feature seen in the sexual reproduction of all land plants is
(1) non-requirement of external water for fertilization.
(2) internal fertilization.
(3) reduced gametophyte.
(4) production of two types of spores.
(5) having two types of sporophytes. (2019-16)

(26) Examples for plants showing homospory are
(1) *Pogonatum* and *Nephrolepis*. (2) *Lycopodium* and *Selaginella*.
(3) *Selaginella* and *Cycas*. (4) *Lycopodium* and *Gnetum*.
(5) *Nephrolepis* and *Pinus*. (2020-20)

Sexual reproduction in flowering plants.

(1) Which of the following is/are least likely to have contributed to the dominance of flowering plants on earth
(A) Autotrophic mode of nutrition
(B) Large size of the plants
(C) Evolution of seeds
(D) Presence of cutin on the aerial surface of plants
(E) Efficient mechanisms for dispersal of spores and seeds (2000)

(2) Which of the following is incorrect regarding the embryo sac of angiosperms?
(1) The embryosac contains a diploid nucleus.
(2) Meosis takes place inside the embryo sac.
(3) Embryo sac is nourished by the nucellus.
(4) Embryo sac gives rise to the endosperm.
(5) Embryo sac contains only one female gamete. (2008)

(3) In angiosperms, Which of the following does not develop from the fertilized ovum?
(1) Cotyledons (2) Endodermis (3) Sclerides
(4) Trachieds (5) Sieve tubes (2011)

(4) Which of the following statements is incorrect regarding parthenocarpy?
(1) Parthenocarpy occurs naturally in certain species of plants.
(2) Parthenocarpy can be induced by some plant growth substances.
(3) In parthenocarpy fruits are formed from the ovary without fertilization of ovules.
(4) Parthenocarpy is commonly seen in fruits such as banana.
(5) Parthenocarpic fruits contain infertile seeds. (2012)

(5) In angiosperms, meiosis occurs during the formation of
(1) pollen mother cells (2) embryo sac (3) megasporangium
(4) megaspore mother cell (5) nuclei in the pollen tube (2013)

(6) A fruit is
(1) a mature ovary (2) a mature ovule (3) the seed and integuments
(4) the fused carpels (5) the enlarged embryosac (2014)

(7) Which of the following is incorrect regarding parthenocarpy?
(1) Parthenocarpic fruits do not contain seeds.
(2) Parthenocarpy is the development of a fruit from an ovary without fertilization.
(3) Parthenocarpy can be induced by artificial methods.
(4) Parthenocarpy is the development of fruits with infertile seeds.
(5) In some species of plants parthenocarpy occurs naturally. (2015)

(8) The male gametophyte of a flowering plant is the
(1) pollen sac (2) microspore. (3) sperm cell.
(4) microspore mother cell. (5) pollen grain. (2018-27)

(9) Seed of a fruit is developed from
(1) egg cell (2) central cell (3) embryo sac (4) ovule (5) ovary (2020-18)

Types of movements in plants

(1) The incorrect response about the comparison between taxis (tactic movements) and tropism (tropic movements) is

	Taxis	Tropism
(1)	Can be seen in some unicellular organisms.	Can be seen in higher plants and some fungi.
(2)	Stimulus can be direct or diffused.	Stimulus is uni directional (unilateral)
(3)	The response is either towards, or away from the stimulus.	Response is always towards the stimulus.
(4)	The entire organism moves.	Only a part of the plant moves.
(5)	Not a growth movement.	Always a growth movement.

(2002)

(2) Which of the following is not true regarding nastic movements?
(1) They occur in a part of a plant.
(2) They are growth or turgor movements.
(3) Direction of response does not depend on the direction of stimulus.
(4) Mechanism of movement depends on the movement of auxin.
(5) Responding cells are located in special regions of the plant. (2008)

(3) Which of the following statements of comparison between tropic movements and nastic movements of plants, is incorrect?
(1) Tropic movements involve a part of a plant, while nastic movements involve the whole plant.
(2) In tropic movements, the direction of response is related to the direction of stimulus, but in nastic movements, there is no such relationship.
(3) Nastic movements are mediated through specialized organs while tropic movements are not.
(4) Both these movements may be mediated through hormones.
(5) Nastic movements are mediated through turgor changes of cells, while tropic movements are not. (2009)

(4) Which of the following statements regarding movements in plants is not correct?
(1) Nyctinastic movements are associated with changes in turgor of parenchymatous cells.
(2) Movement of gameted of higher plants are tactic movements.
(3) Wrapping of plant tendrils around a support is a thigmotropic movement.
(4) In geotropic movements cytokinins play a major role.
(5) Opening and closing of a flower is a nastic movement. (2012)

(5) In which of the following plant movements the direction of the stimulus determines the direction of the response?
(A) Phototropism (B) Geotropism (C) Nyctinasty
(D) Thigmotropism (E) Photonasty (2013)

(6) Opening of some flowers in the day and closing at night is an example of
(1) tactic movement (2) thigmonastic movement
(3) nyctinastic movement (4) phototropic movement
(5) thigmotropic movement (2017-28)

(7) Select the correct statement regarding thigmotropism
(I) It can be seen in male gametes of some plants.
(2) Auxins are not involved in it.
(3) Unequal elongation in different regions of plant can occur during it.
(4) Pollen tube growing towards ovule is an example for it.
(5) Cytokinins are involved in it. (2018-26)

Role of plant growth substances.

(1) Which of the following classes of plant hormones play a major role in cell division?
(1) Auxins (2) Gibberellins (3) Abcissic acid
(4) Cytokinins (5) Ethylene (2000)

(2) Auxins stimulate
(1) cell division of stem apex. (2) rooting of stem cutting.
(3) growth of lateral buds. (4) ripening of fruits.
(5) breaking of seed dormancy. (2002)

(3) Which of the following statements regarding plant growht substance in incorrect?
(1) Ethylene promotes ripening of fruits.
(2) Auxins promote root initiation.
(3) Gibberellins break seed dormancy.
(4) Cytokinines delay aging of leaves.
(5) Abscisic acid breaks seed dormancy. (2005)

(4) Main site of hormone production in plant is the
(1) cambium (2) apical meristem (3) mesophyll
(4) vascular tissue (5) ground tissue (2005)

(5) Select the incorrect statement/statements.
(A) Plant growth substances are involved in the regulation of plant movements.
(B) IBA is a natural plant growth substance.
(C) Unilateral light affects the distribution of IAA in tips of plant shoots.
(D) IAA stimulates the growth of axillarty buds of plants.
(E) IBA is used to induce adventitious roots in stem cuttings. (2006)

(6) Which of the following is a narural plant growth substance?
(1) IBA (2) NAA (3) MCPA (4) 2-4-D (5) ABA (2008)

(7) Which of the following is/are incorrect regarding cytokinin?
(A) It is produced in root apex.
(B) It is transported in xylem tissue.
(C) It promotes germination of seeds.
(D) It is commonly used in tissue culture.
(E) It promoted elongation of stems. (2010)

(8) Which one of the following classes of plant hormones are essential for mitosis and cell division?
(1) Auxins (2) Gibberellins (3) Abscisic acid
(4) Gytokinins (5) Ethylene (2011)

(9) Which of the following plant growht substances are transported through the xylem?
(1) Auxins and Cytokinins (2) Cytokinins and Abscisic acid
(3) Gibberellins and abscisic acid (4) Ethylene and Cytokinins
(5) Auxins and Gibberellins (2012)

(10) Which of the following plant growth substances is/are transported through the xylem?
(A) IAA (B) Gibberellic acid (C) Cytokinins
(D) Abscisic acid (E) Ethylene (2014)

(11) Which of the following is **incorrect** regarding transport of plant growth substances?
(1) IAA is transported through parenchyma cells from stem apices.
(2) Cytokinins are transported from root apices throgh xylem.
(3) Gibberellins produced in young leaves are transported through xylem.
(4) Abscisic acid produced in root caps is transported through xylem.
(5) Ethylene produced in fruits is transported in phloem. (2015)

(12) Which of the following plant growth substances prevents leaf fall?
(1) Abscisic acid (2) Auxins (3) Cytokinins
(4) Gibberellins (5) Ethylene (2016-27)

(13) Select the plant growth substance which stimulates elongation of internodes and activates the enzymes in seed germination.
(1) Ethylene (2) Abscisic acid (3) Cytokinin
(4) Gibberellin (5) Auxin (2018-20)

(14) Some plant hormones are given below
A – Abscisic acid
B – Cytokinins
C – Ethylene
D – Gibberellins
Of the above hormones, leaf senescence is promoted by
(1) A and B only (2) A and C only (3) B and C only
(4) C and D only (5) A, B and C only (2020-19)

Diversity of organisms within kingdom Protista

(1) 5 (2) 5

Diversity of organisms within kingdom Plantae

(1)	4	(2)	3	(3)	5	(4)	2	(5)	5	(6)	2
(7)	5	(8)	2	(9)	2	(10)	4	(11)	4	(12)	4
(13)	3	(14)	3								

Diversity of organisms within kingdom Fungi

(1)	4	(2)	3	(3)	5	(4)	2

Diversity of organisms within kingdom Animalia
External features of classes of Animal Phyla
Characteristic features of phylum chordata and classes of chordata

(1)	3	(2)	2	(3)	3	(4)	1	(5)	2	(6)	2
(7)	3	(8)	1	(9)	5	(10)	3	(11)	2	(12)	5
(13)	3	(14)	1	(15)	4	(16)	4	(17)	4	(18)	3
(19)	all	(20)	3	(21)	4	(22)	4	(23)	3	(24)	4
(25)	3	(26)	3	(27)	2	(28)	2	(29)	1/5	(30)	3
(31)	4	(32)	5	(33)	2	(34)	5	(35)	4	(36)	1
(37)	4	(38)	5	(39)	1	(40)	3	(41)	3	(42)	2
(43)	5										

Unit 4

Structure and functions of plant tissues.

(1)	4	(2)	2	(3)	all	(4)	2/4	(5)	3

Growth and development of a plant

(1)	2	(2)	1	(3)	3	(4)	2	(5)	2	(6)	4
(7)	3	(8)	2	(9)	5	(10)	4				

Process of gaseous exchange in plants.

(1)	1	(2)	1	(3)	2	(4)	3	(5)	2	(6)	4

Concepts and processes involve in transport of water and minerals

(1)	4	(2)	3	(3)	3	(4)	3	(5)	5	(6)	2
(7)	4	(8)	1	(9)	3	(10)	1	(11)	3	(12)	1
(13)	4	(14)	3/4	(15)	5	(16)	1	(17)	2	(18)	5
(19)	3	(20)	4								

Processes involve in translocation of food in plants.

(1) 3 (2) 3 (3) 2 (4) 4 (5) 2 (6) 4

Processes of water loss inplants.

(1) 2 (2) 1 (3) 4 (4) 2 (5) 4 (6) 4
(7) 5

Nutrition
Modes of nutrition in organisms.
Nutritional requirements

(1) 2, 5 (2) 3 (3) 1 (4) 2 (5) 3 (6) 5
(7) 2 (8) 2 (9) 5 (10) 1 (11) 5

Reproductive process in plant
Adaptations of plants for terrestrial life

(1) 4 (2) 5 (3) 5 (4) 2, 4 (5) 5 (6) 4
(7) 3 (8) 3 (9) 5 (10) 2 (11) 4 (12) 2
(13) 3 (14) 3 (15) 2,5 (16) 2 (17) 2 (18) 1
(19) 3 (20) 1 (21) 5 (22) 1 (23) 2 (24) 3
(25) 2 (26) 1

Sexual reproduction in flowering plants.

(1) 3 (2) 2 (3) 4 (4) 5 (5) 2 (6) 1
(7) 4 (8) 5 (9) 4

Types of movements in plants

(1) 3 (2) 4 (3) 1 (4) 4 (5) 1 (6) 3
(7) 3

Role of plant growth substances.

(1) 4 (2) 2 (3) 5 (4) 2 (5) 5 (6) 5
(7) 5 (8) 4 (9) 2 (10) 4 (11) 3 (12) 2
(13) 4 (14) 2