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Moving substances from one part of the body to another ii) Explain the need to transport in plants and animals to force nutrients to move from one point to another the movement of respiratory gases, i.e. oxygen and carbon IV oxide elimination metabolic waste movement hormones movement of water movement salts of motion enzymes

(b) (i) Describe the structure and function of the root hairs of the root hairs are near the tip of the root. As projections that are in contact with soil particles they are permeable to water and mineral salts, therefore used to absorb water and mineral salts There a large amount offers a large surface area (ii) The condition of the ways in which root hair is adapted to their functions root hair long / narrow / numerous to increase the surface area to absorb water and mineral salts many mitochondria in the cytoplasm to supply energy to the energy supply to speed up the absorption rate of water and mineral salts (c) (i) Compare the internal structure of the dicotyledon root and the monocotyledon root (ii) to quench the similarities and differences between dicotyledon and monocotyledonous root similarities used for fixing and absorbing water, and mineral salts, both have root hairs, epidermis, bark, endodermis and vascular beams (xylem and phloem) can both be used to store food/storage organs Differences Monocotyledonous phloem and xylem located in the shape of a ring alternately pith present Dicotyledonous phloem lies between the radial rays of the central xylem (star-shaped) pith missing iii) Compare the internal structure of the monocotyledon Dicotyledonous stalk i) Give Similarities and differences between monocotyledonous and dicotyledonous stem similarities are both used to protect how to conduct water, salt and food both have an epidermis, bark, pericycle and vascular bundles differences Monocotyledon The vascular bundles are many and scattered some of them are hollow cores or cores missing no cambium layer so can not pass the secondary growth of very little bark Dicotyledonous vascular bundles small and located in a concentric ring Near the epidermis pit large and well-developed state structure no layer of cambium so can not pass the secondary growth of very little presence of the bark cambium so undergoes secondary growth of the bark has several layers of cells c) (i) Name the transport structures of the flowering plant xylem vessels and tracheids transporting water and mineral salts from the soil Phloem translocates made food from other parts of the body in which xylem vessels are adapted to their function lignified To facilitate capillaries there are no transverse walls for continuous flow / water column bordered pits for lateral water movement (a) Why do flowering plants need water? Photosynthesis transport turgidity w h helps in supporting solvent plants i.e. environment for chemical reactions cooling effect during seed germination ii) Describe the movement of water from the soil into the leaves of a high plant Soil water exists as a thin film in the soil, between soil particles the concentration of root hair cell juice more than that of the surrounding solution in the soil, thus, Drawing water molecules through the cell wall and cell membrane in the root hair of the osmosis water drawn into the root hair cell dilutes the cell juice makes it less concentrated than in the adjacent cortex cells because of the osmotic gradient water moves from root hair cells to the cortex, from cell to cell osmosis, through endodermis active transport to xylem root vessels that carry water into the xylem vessels of the stem into the xylemic vessels of Stem leaves after that as in stem water moves the plant, helped by the narrowness of xylem vessels (capillaries), root pressure, the attraction of water molecules to each other (clutch). Bringing water molecules to the walls (adhesion) of stem water enters the xylem leaves the water moves in the xylem vessels of the stem in a continuous (continuous) column of water until the leaves of the tree leaves once in the leaves the water moves into the mesophyll cells of the osmosis, As the water evaporates from the spongy channel of the mesophyll cells their juice becomes more concentrated than the neighboring cells as a result of the water flowing into the cell from other surrounding cells, which in turn takes in water from the xylemic vessels in the veins of the leaves it creates a pull (sucking force) called transpiration pull that pulls the flow of water from the stems into the stem and roots. The transpiration pull supports a continuous column of water from the roots to the leaves. (iii) Name the process by which mineral salts enter the plant of active transport diffusion (i) Explain the forces that make water and mineral salts move through plant mineral salts taken due to diffusion due to the concentration of gradient between the mineral ion in the juice and those in the soil decision of active transport involves energy in the form of ATP due to breathing, which causes mineral salts through the plant against the concentration of the gradient of water moves wasp moz through the semi-permeable membrane of the root hair and between the stem cell cells in stem water moves in cohesion (bringing water molecules to each other) it also moves by adhesion (attraction of water molecules to walls) capillary due to narrowness of xylem vessels transpiration pull occurs when water vapor evaporates from substomaal chambers into the pressure of the air root is a force that Water to stem from the roots and causes guttation / exudation ii) Explain the absorption of mineral salts by plants plants require mineral salts to metabolize and proper functioning of their body mineral salts taken from the soil in the root hair in the form of the solution by active transport, which requires energy of active transport involves substances called carriers, taken together with water, and then transported to the stems and leaves the main process involved in the absorption and movement of mineral salts is active transport b) (i) What is transpiration? Loss of water from plant to atmosphere ii) Name the places through which transpiration occurs in plant stomata (stomatal transpiration) lenticula (lenticular transpiration) cuticle (cuticular transpiration) iii) (c) (i) The larger the stomata, the higher the speed and vice versa turgidity of the guard cells that control the opening and closing of the stomata when they open the speed of transpiration is the high size of the leaves, where the larger the surface area, the higher the rate of drop of transpiration of the leaves leads to a decrease in the rate of transpiration, and the drying of the leaves reduces the rate of transpiration Thin cuticula reduces the distance through which the water evaporates, hence the increase in the speed of transpiration. The lack of cuticles also increase the speed of transpiration (ii) Explain the environmental factors that affect the speed of transpiration in plants high temperature increases the speed of transpiration and low temperature reduces the speed of speed when the high speed of transpiration is higher in moving air (wind) than in the air high intensity of light increases the internal temperature, hence the higher rate of evaporation leads to a higher rate of high speed of transpiration of water access to water in the water. more atmospheric pressure losses in the atmosphere when high leads to more evaporation and when low leads to low water evaporation rate iii) The state of structural differences between xylem vessels and sieve tube tubes have a transverse wall while xylem vessels have no xylem vessels lignified while sieve tubes do not sieve tube cytoplasm elements while the cytoplas did not have a single xylem vessels lignified while the sieve tubes do not sieve the tubes of the cytoplasm elements. iv) State adaptation plants that allow them to reduce water loss of thick wax cuticles reduced the size of leaves / spikes / spikes shed the leaves of the sunken stomata. Water vapor accumulates in depression stomata reducing the concentration of water vapor gradient, leading to a decrease in evaporation of rolling leaves v) Condition of factors that cause an increase in the rate of transpiration from leaves increase light Explain how lowering leaves on a hot sunny day is beneficial for a plant to reduce the surface area exposed to the sun, reducing to cuticular transpiration (c) Explain how aquatic and terrestrial plants are adapted to solve the problems of transpiration a. Mesophytes, which they grow in soils with sufficient water loss, are perfectly balanced by the absorption of more soil without special adaptations. The xerophytes they grow in dry root conditions grow very deep to absorb the water juicy / meaty leaves to store water a few stomata, which sunken thickened wax leaves cuticle hairy and often folding some needle leaves like / spikes or scales of leaf surfaces are reduced i.e. small leaves all these adaptation to reduce water loss c. Hydrophyte plants that grow in the presence of water leaves scleroids broad leaves have a lot of stomata only on the top side (none on the lower surface) some leaves float on the lack of water or the reduction of the cuticle leaves of large air spaces some leaves are submerged poorly developed or reduced vascular beams (i) what such translocation of the transmission of industrial food substances in the part where they are needed ii) The name of the tissue that is responsible for the translocation of plants Name the processes that cause the translocation of manufactured food active transport diffusion masses stream Cytoplasmic flow iv) Draw a tagged diagram, to represent phloem tissue (ii) The state functions of laboratory structures of cytoplasmic threads of translocation Companion cell supply of nutrients for a sieve tube power cell for translocation regulates the activity of tube cells / elements of the Sieve tube element carrying food down for example, oxygen oil / lipid tar vitamins Describe an experiment that you would conduct in order to demonstrate that phloem transports manufactured food substances at the plant. Ring experiment cut the ring in the bark, including phloem from the stem of the tree plant phloem is located next to or just below the bark observe daily for some time (more than three weeks) the swelling of the bark appears over the ring is due to the accumulation of food from the leaves of the bark of the second similar plant removed carefully leaving the phloem intact tumor does not appear ii) The use of radio-active tracers C14 is found at the end of the products photosynthesis This, removes the second similar plant Finally discovered in phloem C14 is to move in both directions iii) Collecting exudate from stylets aphids feed on certain plant phloem, using their stylets of mouth parts are opened with sharp razor exes from parts of the mouth collected, and then analyzed sucrose turns out to be one of the main components phloem translocates manufactured food e) Describe an experiment that you would conduct to demonstrate that xylem transports water i. Either cut the stem of a young plant or a sprig of wood under water, or uproot a young herbaceous plant and rinse the soil gently to put a little water in a glass and add dye i.e. eosin or red ink and place a cut in a small Between 20 minutes and one hour cut a thin area of the stem or sheet mount it on the slide and examine under a microscope observes and notes the distribution of dye or ink, the dye appears only in the vessels of xylem ii. OR use radio-active tracers, C14 in the form of a carbon ring plant then put it in a container containing radio-active phosphorus solution Radio-active phosphorus later detected in the leaves. 2. (a) (i) List the components of the animal blood vessel transport system, in which materials circulate around the blood of the body, a liquid environment that contains dissolved substances and heart cells, the pumping mechanism that keeps the blood in circulation ii) The difference between closed and open circulatory systems closed the system has blood vessels through which the blood moves, for example, the vertebrate open system has no blood vessels, hence the blood is in direct contact with the tissues e. the benefits of a closed circulatory system before the open blood system? The closed system has continuous vessels, hence, able to generate high blood pressure circulating at a greater distance circulates blood with a higher rate Effective transportation of nutrients and waste animals more active iv) The difference between one circulatory system and dual circulatory system single blood passes through the heart once in the full body chain Double blood circulation gets to the heart twice in the full circulation of the lung circulation from the

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