

First year Biology complete notes

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CHAPTER 14

DIFFUSION: Free movement of molecules from higher to lower concentration. It is also called passive transport. During this process, the energy of cell is not used.

FACILITATED DIFFUSION: A kind of diffusion in which molecules diffuse with the help of transport enzyme. For example glucose diffuses into cell with the help of intrinsic proteins.

OSMOSIS: Movement of molecules from higher to lower concentration, through cell membrane. This is also passive process.

ACTIVE TRANSPORT: Movement of molecules from lower to higher concentration. This process mostly occurs in those cells which have large number of mitochondria. It is active process and the energy of cell is used.

IMBIBITION: Uptake of water by hydrophilic (water loving) tissue (such as seeds), which results into increase in size.

TURGID CELL: When water enters into cell, it becomes full of water and is called turgid cell. The process of cell filling is called turgidity.

PLASMOLYSIS: Shrinkage of protoplasm due to removal of water from cell is called plasmolysis. Plasmolysis occur when cell is exposed to hypotonic solution

INCIPIENT PROTOPLASM: Beginning of shrinkage of protoplasm during of plasmolysis

DEPLASMOLYSIS: A reverse condition of plasmolysis in which water enters into cell and shrunken protoplasm again gets its normality. De-plasmolysis occur when cell is exposed to hyper tonic solution.

HYPERTONIC SOLUTION: A solution which contains a higher concentration of solutes than the cells, so that water is drawn out of the cells.

HYPOTONIC SOLUTION: A solution which has higher concentration of solvent (water) than solute (salts). It causes water to move from outside to inside of cell.

ISOTONIC SOLUTION: A solution which has equal concentration of solvent and solute.

SYMPLAST: Movement of solution from cytoplasm of one cell to other and onwards is called symplast movement.

APOPLST: Movement of solution between cell wall and cell membrane of cells is called apoplast movement.

ASCENT OF SAP: Upward movement of solution from root to leaf of a plant is called ascent of sap.

XYME: Woody tissue in vascular plants that provides support and carries water and nutrients up from the roots. It is made up of four parts including trachids and vessels, through which water goes upward.

VESSELS: Thick walled tube like structure of xylem which pick maximum water

TRACHIDS: Elongated cells of xylem. They have pointed ends and pick less water as compared to vessels.

TRANSPIRATION: Removal of water from aerial parts of plants into air through stomata and lenticels.

STOMATA: Openings found in leaves and stem of herbal plants. They are made due to modification of guard cells.

LENTICLES: Pore on the stem of woody plants through which gases are exchanged between the plant and the atmosphere

HYDATHODES: Pores present at the margin of leaf. Through these pores, water is transpired in the form of droplets during night

GUTTATION: Removal of water from hydathodes of leaf at night in the form of droplets.

SOURCE TO SINK MOVEMENT: Movement of food material from leaf to the body tissues of plant is called source to sink movement. Leaf is source and body tissue receiving food are called sink.

PHLOEM LOADING: When food enters into phloem, it is called phloem loading

PHLOEM UNLOADING: When phloem hands over food to body tissue and becomes empty is called phloem unloading

OPLEN CIRCULATORY SYSTEM: A type of system for the circulation of blood in which the blood surrounds all organs and is not restricted to blood vessels. E.g. Arthropods and **mollusks**.

CLOSE CIRCULATORY SYSTEM: A type of circulatory system in which blood is enclosed in blood vessels. E.g. Frog, Fishes, Snake, Duck and man

HAEMOLYPH: The fluid which flows through the hemocoel of invertebrates which have open circulatory systems, like mollusks, arthropods, and tunicates. The fluid is like a combination of the fluids blood and lymph in vertebrates.

INCOMPLETE DOUBLE CIRCULATION: When oxygenated and deoxygenated blood mix together in an animal

COMPLETE DOUBLE CIRCULATION: When oxygenated and deoxygenated blood remains separated in an animal

BLOOD: A fluid (may be colorless or red in color), through which transport of gases, nutrients, hormones and waste products occur.

BLOOD PRESSURE: The force of the blood on the walls of arteries. Two levels of blood pressure are measured-the higher, or systolic, pressure, which occurs each time the heart pushes blood into the vessels, and the lower, or diastolic, pressure, which occurs when the heart rests. In a blood pressure reading of 120/80, for example, 120 is the systolic pressure and 80 is the diastolic pressure. A reading of 120/80 is said to be the normal range. Blood pressure that is too high can cause health problems such as heart attacks and strokes.

BLOOD PLASMA: This is whole blood minus the cells. It has over 90 % water and remaining 10 percent salts, proteins, glucose, autotoxins etc

HYPERTENSION: Low blood pressure or a sudden drop in blood pressure. A person rising quickly from a sitting or reclining position may have a sudden fall in blood pressure, causing dizziness or fainting.

BILIVERDIN: A green pigment found in bile which is formed during heme catabolism, mainly the breaking down of old red blood cells, within the liver. It has the chemical formula $C_{33}H_{34}N_4O_6$. It transforms into the red-orange bile pigment bilirubin.

BILIRUBIN: A red-orange pigment found in bile which is formed when old red blood cells are broken down in the liver. It can also form from other types of heme catabolism. It has the chemical formula $C_{33}H_{36}N_4O_6$. It is transformed from the green bile pigment biliverdin, which is directly formed from heme catabolism. Excessive bilirubin in the blood results in jaundice.

CARBONIC ANHYDRASE: An enzyme in RBCs which play role in transport of carbon di-oxide

PLATELETS: A particle found in the bloodstream that binds to fibrinogen at the site of a wound to begin the blood clotting process. Platelets are formed in bone marrow, where they arise from cells called megakaryocytes.

LEUKAEMIA: A kind of blood cancer in which WBC count increases so much that they stop RBC from proper functioning. This cancer is due to Radiation, Cytotoxic drugs, Retrovirus and genetic disorder.

THALASSAEMIA: An inherited blood disease in which, victim, is unable to make hemoglobin protein. It may be minor or major.

PERICARDIUM: Double layered membrane which surrounds the heart is called pericardium

CARDIAC CYCLE: The complete round of cardiac systole and diastole with the intervals between, or commencing with, any event in the heart's action to the moment when that same event is repeated.

DIASTOLE: The resting period of heart chambers is known as diastole

SYSTOLE: Contraction of heart muscles is known as systole

HEART MURMUR: A diseased condition of heart in which any of the heart walls become defective and produce hissing sounds.

SINO-ATRIAL NODE: The impulse generating (pacemaker) tissue located in the right atrium, under the epicardium at the upper end of the sulcus terminalis.

A-V-NODE: It is a similar tissue like SAN. It is located in right atrium below SAN.

BLUE BABIES: A bluish discoloration, applied especially to such discoloration of skin and mucous membranes due to excessive concentration of reduced hemoglobin in the blood.

ARTERIES: The vessels in the body that supply oxygenated blood to the tissues.

VEINS: The vessels carrying blood toward the heart

CAPILLARIES: The smallest vessels which contain oxygenated blood. The capillaries, allowing red blood cells to travel in single file, are responsible for delivering oxygen to the tissues on a cellular level

SPHYGMOMANOMETER: The original blood pressure apparatus first used to measure arterial pressure

LYMPH: The almost color-less fluid that bathes body tissues and is found in the lymphatic vessels that drain the tissues of the fluid that filters across the blood vessel walls from blood. Lymph carries lymphocytes that have entered the lymph nodes from the blood.

LYMPHATIC SYSTEM: The tissues and organs (including the bone marrow, spleen, thymus and lymph nodes) that produce and store cells that fight infection and the network of vessels that carry lymph.

LYMPH NODE: Small bean-shaped organ made up of a loose meshwork of reticular tissue in which are enmeshed large numbers of lymphocytes, macrophages and accessory cells located along the lymphatic system.

EDEMA: Swelling of tissues due to accumulation of tissue fluids is called edema. It occurs when lymph vessels somehow fail to pick the water from tissues

TRANSPORTATION

IN AMOEBA

It occurs through Diffusion

IN PARAMEIUM

It occurs through Diffusion

IN HYDRA

Through diffusion

IN EARTHWORM

Through dorsal, ventral and sub-neural blood vessel The circulatory system is closed type.

IN GRASSHOPPER

The circulatory system is open and supply of colorless blood is free to whole body

OSTIA

The heart of grasshopper

HUMAN HEART

PERICARDIUM

The covering of heart

PERICARDIAL FLUID

A fluid between heart and pericardium

AURIULAR SEPTUM

A division line between two auricles

VENTRIULAR SEPTUM

A division line between two ventricles

TRICUSPID VALVE

A valve between right auricle and ventricle. It stops the back flow of blood to auricle

BICUSPID VALVE

A valve between left auricle and ventricle. It stops the back flow of blood to left auricle

SINO-AURIULAR NODE

A tissue in right atrium, which maintains the speed of heart beat

PACE MAKER

Same as above

ARTERIAL SYSTEM

ARTERY	SUPPLY
External carotid	Head and face

Internal carotid	Brain
Subclavin	Fore limbs
Intercostal	Ribs and muscles
Coeliac	Liver, stomach and spleen
Anterior mesenteric	Front part of intestine
Posterior mesenteric	Posterior part of intestine
Renal	Kidneys
Genital or Gonadal	Testes and ovaries
Iliolumber	Body wall
Iliac	Hind limbs
Caudal	Tail region

VENOUS SYSTEM

VEINS	COLLECTION
External jugulaer	Region below ear
Internal jugular	Brain, Tongue, Face
Subclavin	Fore limbs and shoulders
Azygous	Intercostal muscles
Bronchial	Thoracic region
External iliac	Legs
Internal Iliac	Ventral abdomen
Iliolumber	Back of body
Gonadial	Reproductive organs
Renal	Kidneys
Hepatic	Liver
Intercostal	Muscles of lower 7 ribs

BLOOD

PLASMA

It is 60 percent of the total blood which contain blood protein, glucose, amino acids, hormones etc.
90% of plasma is water and 10% dissolved substances.

CORPUSCLES

They are 40 % and of two types

	ERYTHROCYTES	LEUCOCYTES
SHAPE	Biconcave,	Irregular
NUCLEUS	Absent	Present
COMPOSITION	Bone marrow	Bone marrow, Lymph nodes,
LIFE	120 days	Spleen, Thymus gland
DESTRUCTION	Spleen	20-30 hours
		Blood vessels

HEMOGLOBIN

A protein in RBC. It has affinity with oxygen

OXYHAEMOGLOBIN

Hemoglobin after carrying oxygen

AGRANULCYTE

WBC with clear cytoplasm

GRANULOCYTE

WBC with granules

NEUTROPHILS

A type of WBC which phagocyte

MONOCYTES

An other type of WBC with same function

LYMPHOCYTES

A type of WBC which produce anti-toxic substance to neutralize the toxic effect

PLATELETS

Biconvex, colorless non-nucleated cells, which help in blood clotting

LYMPH

A fluid which is obtained from blood plasma. Its main function is to help in body resistance.

TRANSPIRATION

Removal of extra amount of water from aerial parts of plant

STOMATAL

A type of transpiration in which the water is

TRANSPIRATION CUTICULAR

A type of transpiration in which the water is removed from cuticle (surface) of plant

TRANSPIRATION LENTICULAR

A type of transpiration in which water is removed from woody parts of plant

GUTTATION

The removal of water from aerial parts of plant during night. This water is removed in the form of drop lets

PRACTICE SHEET

1. Each organism must synthesize its own -----for energy
 - (a) Glucose
 - (b) ATP**
 - (c) ADP
 - (d) None
2. When glucose is glycolysed, waste products are suppose to be not produced
 - (a) True
 - (b) False**
3. Loading of food from photosynthetic cells into sieve tubes of phloem is called
 - (a) short distance transport**
 - (b) Long distance transport
 - (c) Both a&b
 - (d) None
1. In order to translocation of food material, plants need
 - (a) Short distance transport
 - (b) Long distance transport
 - (c) Both a&b**
 - (d) None
2. The rate of diffusion depends up on
 - (a) Size of molecule
 - (b) Nature of molecule
 - (c) Both a&b**
 - (d) None
3. Smaller molecules move across the cell membrane
 - (a) Faster that large molecules**
 - (b) Slower that large molecules
 - (c) Both large and small move at same time
 - (d) None
4. At high temperature, the rate of diffusion is
 - (a) Low
 - (b) Moderate
 - (c) High**
 - (d) All
5. Charged particles, and ions, including Glucose can pass through cell membrane
 - (a) Easily
 - (b) Requires support of intrinsic proteins**
 - (c) It s conditional
 - (d) None
6. Glucose molecule can not pass the barrier of cell membrane, therefore it requires help of intrinsic proteins to help in crossing
 - (a) True**
 - (b) False
7. When any required chemical can not diffuse across cell membrane, it requires help of
 - (a) Facilitated diffusion
 - (b) Intrinsic proteins
 - (c) Transport proteins
 - (d) Both a&b**
8. The energy of cell is not used in the process of
 - (a) Diffusion**

- (b) Facilitated diffusion
 - (c) Both a&b
 - (d) None
9. The cells or tissue carrying out active transport are characterized by presence of numerous
- (a) **Mitochondria**
 - (b) Endoplasmic reticulum
 - (c) Ribosomes
 - (d) All
10. Sodium potassium pump is example of
- (a) Passive transport
 - (b) **Active transport**
 - (c) Facilitated diffusion
 - (d) All
11. The absorption of soluble glucose by villi, from intestine into blood vessels is
- (a) **Active transport**
 - (b) Passive transport
 - (c) Facilitated diffusion
 - (d) All
12. Plants have 2 types of tissues, hydrophilic and hydrophobic. If hydrophilic tissue uptakes water and its sizes is enlarged, it defines
- (a) Absorption
 - (b) **Imbibition**
 - (c) Assimilation
 - (d) All
13. One of the following processes is not example of imbibition
- (a) Swelling up of seed after in taking water
 - (b) Wrapping of wooden framework
 - (c) **Turgidity of cell**
 - (d) None
14. Addition of solute particles
- (a) **Lower the water potential**
 - (b) Increase the water potential
 - (c) Both a&b
 - (d) None
15. Water potential is actually capacity to loose water
- (a) **True**
 - (b) False
16. All solutions have negative water potential
- (a) **True**
 - (b) False
17. The pressure exerted upon a solution to keep it is equilibrium with pure water is called
- (a) Water potential
 - (b) **Osmotic potential**
 - (c) Both a&b
 - (d) None
18. Osmotic potential is actually a measure of the tendency of water to move by osmosis
- (a) **True**
 - (b) False
19. The other term used for **water potential** is
- (a) **Pressure** potential
 - (b) Osmotic potential

- (c) Both a&b
 - (d) None
20. Other than cell wall, the regulation of water is controlled by
- (a) Cell wall
 - (b) Vacuole**
 - (c) Cytoplasm
 - (d) Nucleus
21. The concentration of solute in a solution is termed as
- (a) Water potential
 - (b) Osmotic potential
 - (c) Pressure potential
 - (d) Solute potential**
22. A cell which is filled with water is called
- (a) Flaccid
 - (b) Imbibed
 - (c) Turgid**
 - (d) All
23. Removal of cellular water followed by shrinkage of protoplasm is due to
- (a) De-plasmolysis
 - (b) Plasmolysis**
 - (c) Osmosis
 - (d) Facilitated diffusion
24. If a turgid cell is placed in hypertonic solution, it will
- (a) Loose water by exo-osmosis**
 - (b) Gain water by endo-osmosis
 - (c) It will remain turgid
 - (d) It will burst
25. When turgid cell starts losing its water, and protoplasm starts shrinkage, at that time cell condition is called
- (a) Incipient plasmolysis**
 - (b) Incomplete plasmolysis
 - (c) Both a&b
 - (d) None
26. If a plasmolysed cell is placed in hypotonic solution, the water will flow into cell by endo-osmosis. The shrunken protoplasm will gain its normal position. This defines
- (a) Plasmolysis
 - (b) De-plasmolysis**
 - (c) Cell turgidity
 - (d) None
27. After de-plasmolysis, the cell becomes
- (a) Turgid (full of water)**
 - (b) Flaccid (empty)
 - (c) Both a&b
 - (d) None
28. The out growth of epidermal cells will form
- (a) Roots
 - (b) Root hairs**
 - (c) Root cap
 - (d) Branch roots
29. The Root hairs -----the surface area for absorption
- (a) Increase**

- (b) Decrease
 - (c) Depends up on soil
 - (d) None
30. The root hairs are attached with soil particles because they have
- (a) Love for water
 - (b) Sticky wall**
 - (c) Suppose to up-take water
 - (d) All
31. Most of the water is absorbed at
- (a) Root tip**
 - (b) Middle of root because it is wide
 - (c) Both a&b
 - (d) None
32. When root hairs absorb water it
- (a) Directly enters into xylem
 - (b) It reaches xylem through cortex cells**
 - (c) There is no cortex in roots
 - (d) All
33. When water crosses Plasmodesmata and crosses through cytoplasm of cells and finally reaches in xylem, this route is called
- (a) Symplast**
 - (b) Apoplast
 - (c) Both a&b
 - (d) None
34. When water moves between cell wall and cell membrane and finally reaches the xylem, this route is called
- (a) Symplast
 - (b) Apoplast**
 - (c) Both a&b
 - (d) None
35. Plants uptake from soil
- (a) Solvent
 - (b) Solute
 - (c) Solution**
 - (d) None
39. The water absorbed from soil directly goes to xylem cells
- (a) It goes from root hairs to xylem
 - (b) It goes from root hairs to cortex and than xylem**
 - © It can enter from any part of root
 - (d) None
40. Plants have more stomata in
- (a) Leaves**
 - (b) Herbaceous stem
 - © Both a&b
 - (e) None
41. Stephen Hales (1927) discovered
- (a) Transpirational Pull
 - (b) Root Pressure**
 - © Guttation
 - (d) Transpiration
42. Guttation water is removed in the form of droplets from

- (a) Stomata
- (b) Lenticles

© **Hydathodes**

- (d) All

43. One of the following has inverse effect on transpiration

- (a) Wind
- (b) Light

© Soil water

- (d) Humidity

44. The mechanism by which food material is transported to various parts of plants is called

- (a) Transportation

(b) **Translocation**

© Ascent of Sap

- (d) Phloem loading

45. In phylum arthropod entire body is filled with colorless blood and is called

(a) **Haemocoel**

- (b) Hemolymph

© Both a&b

- (d) None

46. Blood and interstitial fluids are collectively known as

(a) **Hemolymph**

- (b) Hemocoel

© Both a&b

- (d) All

47. Heart of one of the following animals never receives oxygenated blood

- (a) Frog

(b) **Fish**

© Man

- (d) Snake

48. One of the following is miss-match

- (a) Frog -----3 chambered heart

(b) Reptiles-----**2 chambered heart**

© Man-----four chambered heart

- (d) Birds-----Four chambered heart

49. One of the following reptiles has divided ventricle, so the heart is four chambered

- (a) Snake

(b) **Crocodile**

© Lizard

- (d) Turtle

50. Blood is red color connective tissue having colorless

(a) **Plasma**

- (b) Platelets

© Thrombocytes

- (d) None

51. The enzyme -----present in RBC plays important role in transport of Co₂

- (a) Estrases

(b) **Carbonic anhydrases**

© Glucosidases

- (d) None
52. The total life span of erythrocytes is
 (a) 100 days
 (b) **120 days**
 © 210 days
 (d) Variable
53. Total life span of leucocytes is
 (a) **20-30 hours**
 (b) 24 hours
 © 10 hours
54. Mammalian RBCs are non-nucleated because to
 (a) **Accommodate more Hb**
 (b) They are immature
 © Have short life
 (e) All
55. In one of the following condition, there is increased number of leucocytes in blood
 (a) Thalassaemiia
 (b) **Leukemia**
 © Myocardial infraction
 (d) All
56. A blood disorder in which Hb is not produced in RBCs is
 (a) **Thalasemia**
 (b) Hemophilia
 © Both a&b
 (c) None
57. Heterozygous babies have thalasemia
 (a) Major
 (b) **Minor**
 © Both a&b
 (d) None
58. Contraction of hear muscles is called systole, and during that
 (a) Blood returns to heart
 (b) **Goes to body**
 © Blood is pushed out of heart
 (d) Both b&c
59. The volume of blood pumped per minute by left ventricle into systemic circuit is called
 (a) Cardiac cycle
 (b) **Cardiac out put**
 © Heart beat
 (d) None
60. Normal heart beat of humans is
 (a) 70 per 60 seconds
 (b) **72 per 60 seconds**
 (c) 77 per 60 seconds
 (d) Variable

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