



# Chapter 14

## Transport

### TOPIC-WISE MULTIPLE-CHOICE QUESTIONS

#### INTRODUCTION, TRANSPORT IN PLANTS

#### KIPS MCQs

- (1) Most of the ions enter the root hairs:
  - (a) In bulk flow
  - (b) Active transport
  - (c) Facilitated diffusion
  - (d) All of these
- (2) The uptake of minerals by roots:
  - (a) Is passive process
  - (b) Is active process
  - (c) May be against concentration gradient
  - (d) All of these
- (3) Ions moving in the \_\_\_\_\_ pathway cannot reach beyond endodermis.
  - (a) Apoplast
  - (b) Symplast
  - (c) Vacuolar
  - (d) Both "a" & "b"
- (4) Pick out correct route of water molecule from soil to xylem:
  - (a) Soil-cortex-epidermis-endodermis
  - (b) Soil-epidermis-cortex-endodermis
  - (c) Soil-root hairs-endodermis-cortex
  - (d) Soil-plasmodesmata-root hairs-epidermis
- (5) Mycorrhizae are present in:
  - (a) 50% of the vascular plants
  - (b) 70% of Gymnosperms
  - (c) 90% of gymnosperms
  - (d) 90% of Angiosperms
- (6) Which factor determines water potential?
  - (a) Solute concentration
  - (b) Pressure potential
  - (c) Potential energy of water molecules
  - (d) Both "a" & "b"
- (7) One liter of \_\_\_\_\_ percentage glucose solution will be having maximum water potential.
  - (a) 1
  - (b) 10
  - (c) 20
  - (d) 50
- (8) In a solution which of the following will decrease the water potential?
  - (a) K.E. of water molecules
  - (b) Solute concentration
  - (c) Pressure potential
  - (d) All of these
- (9) In a solution, \_\_\_\_\_ is equal to water potential.
  - (a) Water potential plus solute potential
  - (b) Water potential minus solute potential
  - (c) Solute potential minus Generator potential
  - (d) Solute potential plus pressure potential
- (10) Force exerted by the protoplast against the cell wall is called \_\_\_\_\_ potential.
  - (a) Osmotic
  - (b) Pressure
  - (c) Solute
  - (d) Generator
- (11) When a cell is placed in a solution with higher solute concentration \_\_\_\_\_ potential of cell will decrease.
  - (a) Solute
  - (b) Water
  - (c) Both "a" and "b"
  - (d) Neither "a" nor "b"
- (12) The casparian strips are present in:
  - (a) Cortex cells of roots
  - (b) Endodermis cells of roots
  - (c) Cells of pericycle
  - (d) Cells of phloem

- (13) Which of the following process cause substances to move across membranes without the expenditure of cellular energy?  
 (a) Endocytosis (b) Active transport  
 (c) Diffusion (d) None of these
- (14) The shrinkage of protoplast due to exosmosis is:  
 (a) Ascent of sap (b) Guttation  
 (c) Plasmolysis (d) Deplasmolysis
- (15) The roots of prosopis may penetrate deep in soil up to:  
 (a) 5m (b) 25m  
 (c) 50m (d) 70m

**FAST TRACKERS MCQs**

- (16) Change in water potential of a system due to the presence of solute molecules is called: (LHR 2017)  
 (a) Pressure potential (b) Solute potential  
 (c) Matric potential (d) Gravitational potential
- (17) The loss of water through hydathodes is called: (DGK 2017)  
 (a) Transpiration (b) Bleeding  
 (c) Guttation (d) Imbibition
- (18) Pathway of water consisting of interconnected protoplasts in roots cells is called: (DGK 2017)  
 (a) Apoplast (b) Symplast  
 (c) Protoplast (d) Tonoplast
- (19) Water potential of pure water is: (SGD 2017)  
 (a) +10 (b) + 5  
 (c) Zero (d) - 10
- (20) Loss of liquid water through secreting glands or hydathodes is called: (SWL 2017)  
 (a) Transpiration (a) Evaporation  
 (c) Guttation (d) Imbibition
- (21) Bleeding phenomenon is not shown by: (MTN 2017)  
 (a) Strawberry (b) Sugar maple  
 (c) Grape wine (d) palms
- (22) The maximum depth of roots of Prosopis is: (BWP 2017)  
 (a) 40 meters (b) 50 meters  
 (c) 60 meters (d) 70 meters
- (23) Casparian strips are present in: (GRW 2018)  
 (a) Epidermis (b) Endodermis  
 (c) Cortex (d) Pericycle
- (24) The casparian strips are present in: (LHR 2019)  
 (a) Cortex cells of roots (b) Endodermis cells of root  
 (c) Cells of pericycle (d) Cells of phloem
- (25) The phenomenon in which loss of liquid water secreting glands takes place is: (GRW 2019)  
 (a) Imbibition (b) Guttation  
 (c) Ascent of sap (d) Bleeding
- (26) Apoplast pathway become discontinuous is endodermis due to: (DGK 2019)  
 (a) Pericycle (b) Casparian strip  
 (c) Cortex (d) Xylem

- (27) Lenticels are aerating pores formed in the: (SGD 2019)  
 (a) Bark (b) Epidermis  
 (c) Endodermis (d) Pericycle
- (28) The loss of water through Hydathodes in leaves is called: (MCN 2021)  
 (a) Bleeding (b) Transpiration  
 (c) Guttation (d) Imbibition
- (29) Casparian strips are present in cells of root: (RWP 2019, SGD 2021)  
 (a) Cortex (b) Epidermis  
 (c) Endodermis (d) Phloem
- (30) Guttation occurs in plants through: (RWP 2017, DGK 2021)  
 (a) Cuticle (b) Hydathodes  
 (c) Lenticels (d) Stomata

**ENTRY TEST BASED MCQs**

- (31) Water and minerals move down their concentration gradient through plasmodesmata, to cells of cortex, endodermis, pericycle and then to sap in the xylem cells. This is also known as the: (MDCAT 2019)  
 (a) Symplastic pathway (b) Vacuolar pathway  
 (c) Mineral absorption pathway (d) Apoplastic pathway
- (32) Flow of blood in the capillaries is adjusted by: (UHS 2022)  
 (a) Heart directly (b) Pre-capillary sphincters  
 (c) Meta-arteriole (d) Valves

**ASCENT OF SAP**

**KIPS MCQs**

- (33) The xylem water tension is strong enough to pull water to \_\_\_\_\_ meters.  
 (a) 200 (b) 300  
 (c) 400 (d) 500
- (34) \_\_\_\_\_ % of the absorbed water is used by plants in its activities during photosynthesis.  
 (a) 1 (b) 2  
 (c) 3 (d) 99
- (35) Which of the following is soluble in water?  
 (a) Cellulose (b) Pectin  
 (c) Lignin (d) None of these
- (36) Root pressure may play a significant role in plants with:  
 (a) Smaller size (b) Larger size  
 (c) With slow rate of transpiration (d) Both "a" & "b"
- (37) When leaves transpire the water potential of mesophyll cells is?  
 (a) Increased (b) Decreased  
 (c) Does not change (d) first increased and then decreased
- (38) Hydathodes are associated with:  
 (a) Transpiration (b) Guttation  
 (c) Conduction (d) None of these

**FAST PAPERS MCQs**

- (39) Cohesion tension theory was proposed by: (SGD 2017)  
 (a) Dixon (b) Robert Brown  
 (c) Sacks (d) Van Mohl

- (40) Closely associated with root pressure is a phenomenon: (MTN 2019)  
 (a) Transpiration (b) Exudation  
 (c) Evaporation (d) Humidity
- (41) Structures that are involved in guttation are: (BWP 2021)  
 (a) Cuticle (b) Stomata  
 (c) Lenticels (d) Hydathodes
- (42) The volume of dry seed may increase up to 200 times by: (BWP 2019, RWP 2021)  
 (a) Diffusion (b) Osmosis  
 (c) Imbibition (d) Active transport
- (43) Hydathodes are linked with one the given processes. (SWL 2022)  
 (a) Imbibition (b) Bleeding  
 (c) Guttation (d) Transpiration
- (44) Guttation occurs in plants through: (BWP 2022)  
 (a) Cuticle (b) Hydathodes  
 (c) Lenticels (d) Stomata

**ENTRY TEST BASED MCQs**

- (45) Four plants are present in different environmental conditions. Plant A is present in warm climate with continuous rainfall, plant B is present in a cool forest, plant C is present in warm climate with little breeze while plant D is present in warm climate high wind speed. Which one of the above plants will have highest rate of transpiration? (MDCAT 2019)  
 (a) Plant B (b) Plant C  
 (c) Plant D (d) Plant A

**TYPES OF TRANSPIRATION****KIPS MCQs**

- (46) Type of transpiration which does not occur in all plants is:  
 (a) Cuticular (b) Lenticular  
 (c) Stomatal (d) None of these
- (47) In dorsiventral leaves stomatal transpiration occurs through stomata located on \_\_\_\_\_ epidermis.  
 (a) Upper (b) Lower  
 (c) Both "a" & "b" (d) None of these
- (48) When the guard cells become turgid, transpiration?  
 (a) Increases (b) Decreases  
 (c) No effect (d) Stops
- (49) In isobilateral leaves stomatal transpiration occurs through \_\_\_\_\_ epidermis.  
 (a) Upper (b) Lower  
 (c) Both "a" & "b" (d) None

**PAST PAPERS MCQs**

- (50) The total transpiration through cuticle is: (LHR 2018)  
 (a) 5 – 7% (b) 1 – 7%  
 (c) 2 – 4% (d) 2 – 5%
- (51) Among the total transpiration taking place in plants, cuticular transpiration is about: (MTN 2019)  
 (a) 1 – 2 % (b) 5 – 7 %  
 (c) 50 – 60 % (d) 90 %

- (52) The pathway involving system of adjacent cell wall: (LHR 2021)  
 (a) Simplest (b) Apoplast  
 (c) Plasmodesmata (d) Vascular
- (53) What happens when the guard cells are turgid? (LCK 2022)  
 (a) Stoma open (b) Stoma closed  
 (c) No effect on stoma (d) Sugar level drop

### OPENING AND CLOSING OF STOMATA

#### KIPS MCQs

- (54) Exposure to the blue light is:  
 (a) Acidification of environment (b) Uptake of  $K^+$  ions of guard cells  
 (c) Turgidity of guard cells (d) All of these
- (55) Which of the following is NOT true of guard cells?  
 (a) They are present in the epidermis of leaf  
 (b) They are connected with plasmodesmata with other epidermal cells  
 (c) They contain chloroplasts  
 (d) They are kidney shaped

#### PAST PAPERS MCQs

- (56) Which light enhance the uptake of  $k^+$  in guard:  
 (a) Red (b) Blue  
 (c) Green (d) Violet
- (57) Plants open their stomata by actively pumping which ions, causing water to follow by osmosis. (GRW 2021)  
 (a) Sodium ions (b) Potassium ions  
 (c) Magnesium ions (d) Iron
- (58) Plasmodesmata are found in: (SWL 2021)  
 (a) Symplast (b) Apoplast  
 (c) Protoplast (d) Chloroplast

### FACTORS AFFECTING THE RATE OF TRANSPIRATION

#### KIPS MCQs

- (59) The rate of transpiration doubles by every rise of temperature about:  
 (a)  $5^{\circ}C$  (b)  $10^{\circ}C$   
 (c)  $15^{\circ}C$  (d)  $20^{\circ}C$

### TRANSLOCATIO OF ORGANIC SOLUTES

#### KIPS MCQs

- (60) Phloem is generally found on the outer side of.  
 (a) Xylem (b) Epidermis  
 (c) Cortex (d) Both "a" & "b"
- (61) Cytoplasmic components are scarce in quantity in:  
 (a) Companion cells (b) Sieve tube cells  
 (c) Cortex cells (d) All of these
- (62) Root of beet acts as:  
 (a) Source (b) Sink  
 (c) Both "a" & "b" (d) Producer
- (63) Average velocity of movement of sugars in phloem is:  
 (a) 1meter/8years (b) 1 meter/day  
 (c) 1 meter/hour (d) 20 cm/min.

- (64) Which the following is/are a sink?  
 (a) Fruit (b) Root  
 (c) Immature leaf (d) All of these
- (65) While moving towards the sieve elements sucrose takes the \_\_\_\_\_ pathway mostly:  
 (a) Apoplast (b) Symplast  
 (c) Vacuolar (d) Both "a" & "b"
- (66) Pressure flow theory accounts for the:  
 (a) Mass flow of molecules within phloem (b) Diffusion within xylem  
 (c) Mass flow of molecules within xylem (d) Diffusion within phloem
- (67) Transport of photosynthate from the mesophyll cells to phloem tissue involves:  
 (a) Diffusion (b) Active transport  
 (c) Carrier mediated transport (d) All of these
- (68) From phloem to sink, sugars are transported by:  
 (a) Diffusion (b) Active transport  
 (c) Carrier mediated transport (d) All of these
- (69) According to pressure flow theory, which of the following usually serves as sink:  
 (a) Leaves (b) Stem  
 (c) Roots (d) None of the these

**PAST PAPERS MCQs**

- (70) The pressure flow theory was first proposed in 1930 by: (FSD 2021)  
 (a) Ernst Haeckel (b) Ernst Munch  
 (c) Flemming (d) Dixon
- (71) The cells which supply ATP and proteins to sieve tubes are: (LHR 2022)  
 (a) Companion (b) Epidermal  
 (c) Tracheids (d) Vessels
- (72) How sugars are transported in plant cells? (SGD 2022)  
 (a) By sieve (b) By sieve pipes  
 (c) By sieve element (d) By sieve compound

**TRANSPORT IN ANIMALS**

**(TRANSPORTATION IN HYDRA AND PLANARI) (a)**

**KIPS MCQs**

- (73) Which of the following has maximum surface area to volume ratio?  
 (a) Amoeba (b) Hydra  
 (c) Sponge (d) Whale
- (74) Habitat of hydra is:  
 (a) Terrestrial (b) Fresh water  
 (c) Marine (d) Both "b" & "c"
- (75) Diffusion is the process involved in the movement of materials into and out of the cells in:  
 (a) Hydra (b) Planaria  
 (c) None of "a" & "b" (d) Both "a" & "b"
- (76) There is no special transport system in:  
 (a) Planaria (b) Hydra  
 (c) Paramecium (d) All of these
- (77) Ectodermal cells in hydra get food from endodermal cells by:  
 (a) Diffusion (b) Active transport  
 (c) Endocytosis (d) Exocytosis

**CIRCULATORY SYSTEM****KIPS MCQs**

- (78) Which of the following has a closed circulatory system?  
 (a) Snail (b) Insect  
 (c) Squid (d) Spider
- (79) Closed circulatory system transports:  
 (a) Oxygen (b) CO<sub>2</sub>  
 (c) Food (d) All of these
- (80) Which of the following is absent in earthworm?  
 (a) Blood (b) Haemoglobin  
 (c) WBC (d) RBC
- (81) Open circulatory system is:  
 (a) More primitive (b) More advanced  
 (c) More efficient (d) Both "b" & "c"
- (82) \_\_\_\_\_ is chief collecting vessel in earthworm:  
 (a) Dorsal Blood Vessel (b) Ventral Blood Vessel  
 (c) Commissural Vessels (d) Subneural blood vessel
- (83) RBCs are not involved in transport of oxygen in:  
 (a) Human (b) Earthworm  
 (c) Cockroach (d) Both 'b' & 'c'
- (84) In cockroach, the blood flows in all these except:  
 (a) Perivisceral sinus (b) Haemocoel  
 (c) Capillaries (d) Perineural sinus

**PAST PAPERS MCQs**

- (85) Open circulatory system is present in: (SGD 2019)  
 (a) Man (b) Cockroach  
 (c) Earthworm (d) Leach
- (86) The heart of cockroach has many chambers. (MTN 2021)  
 (a) 11 (b) 12  
 (c) 13 (d) 14

**VERTEBRATE BLOOD CIRCULATORY SYSTEM****KIPS MCQs**

- (87) Number of ventricles in amphibians is:  
 (a) Zero (b) 1  
 (c) 2 (d) 2
- (88) Which of the following does not have a completely divided four chambered heart?  
 (a) Crocodile (b) Snake  
 (c) Man (d) Pigeon
- (89) Aortic trunk in humans:  
 (a) Emerges from left ventricle (b) Leads to carotids  
 (c) Leads to systemic arches (d) All of these
- (90) No systemic arch disappears in:  
 (a) Pigeon (b) Horse  
 (c) Rat (d) Crocodile
- (91) Bulbous arteriosus is \_\_\_\_\_ in fishes.  
 (a) Part of sinus venosus (b) Proximal part of ventral aorta  
 (c) Distal part of ventral aorta (d) Proximal part of dorsal aorta

- (92) Which of the following is true about mammals?  
 (a) They have right aortic arch only (b) They have left aortic arch only  
 (c) They have left and right aortic arches (d) They do not have aortic arch
- PAST PAPERS MCQs**
- (93) Single circuit heart is found in: (MTN 2017, LHR 2017)  
 (a) Birds (b) Fishes  
 (c) Reptiles (d) Mammals
- (94) The heart of fishes is: (LHR 2018)  
 (a) Single circuit (b) Double circuit  
 (c) Triple circuit (d) Multi circuit
- (95) The heart of which animals never receive Oxygenated Blood: (MTN 2019)  
 (a) Amphibians (b) Fishes  
 (c) Birds (d) Reptiles
- (96) Single circuit heart is present in: (FSD 2017, GRW 2017, BWP 2019)  
 (a) Fish (b) Amphibia  
 (c) Reptiles (d) Mammals
- (97) Cavum venosum and cavum pulmonate are pockets present in heart of: (SWL 2019)  
 (a) Birds (b) Mammals  
 (c) Reptiles (d) Fish
- (98) The left systemic arch disappears in: (LHR 2019)  
 (a) Mammals (b) Fish  
 (c) Reptiles (d) Birds
- (99) Single court heart is found in: (LHR 2021)  
 (a) Amphibians (b) Reptiles  
 (c) Aves (d) Fish
- (100) Which one of the given part of fish body has oxygenated blood? (SWL 2022)  
 (a) Sinus venous (b) Dorsal aorta  
 (c) Ventral aorta (d) Atrium
- (101) Single circuit circulation is found in: (LHR 2017, FSD 2019, FSD 2022)  
 (a) Man (b) Cat  
 (c) Fish (d) Bird

### TRANSPORT IN MAN

#### (THE CIRCULATORY FLUID-THE BLOOD)

#### KIPS MCQs

- (102) A person is weighing 60kg. What will be the approximate weight of his blood?  
 (a) 1 Kg (b) 4Kg  
 (c) 5 Kg (d) 10 Kg
- (103) Together the inorganic ions and salts make up \_\_\_\_\_ % of the plasma:  
 (a) 0.09 (b) 0.9  
 (c) 9 (d) 19
- (104) Which of the following are in highest quantity in plasma?  
 (a) inorganic salts (b) Organic nutrients  
 (c) Plasma proteins (b) Nitrogenous wastes
- (105) Normal pH of human blood is:  
 (a) 7 (b) 7.4  
 (c) 4.7 (d) 7.2



- (106) Which of the following are the least in number?  
 (a) Neutrophils (b) Basophils  
 (c) Lymphocytes (d) Monocytes
- (107) Select the set of WBC's with function opposite to each other:  
 (a) Eosinophil & Basophils (b) Neutrophils & Eosinophil  
 (c) Monocytes & Lymphocytes (d) Platelets & RBC's
- (108) Which of the following has the longest life span?  
 (a) Lymphocytes (b) Monocytes  
 (c) Basophils (d) Eosinophil
- (109) Which of the following is not included in granulocytes?  
 (a) Eosinophils (b) Eosinophil  
 (c) Neutrophils (d) Lymphocyte
- (110) The solutes in plasma can be divided into \_\_\_\_\_ categories.  
 (a) 3 (b) 5  
 (c) 6 (d) 9
- (111) Small particles in blood are phagocytosed by:  
 (a) Neutrophils (b) Eosinophil  
 (c) Basophils (d) Monocytes
- (112) Interferons protect our body by attacking on:  
 (a) Proteins of invading organisms (b) Carbohydrates of invading organisms  
 (c) Nucleic acids of invading organisms (d) None of these
- (113) Cholesterol is the precursor of \_\_\_\_\_ hormone.  
 (a) Polypeptide (b) Steroid  
 (c) Proteins (d) Amino acid derivatives
- (114) \_\_\_\_\_ WBCs are present in highest proportion in blood.  
 (a) Neutrophils (b) Basophils  
 (c) Lymphocytes (d) Eosinophil
- (115) Which salts is most abundant in blood plasma?  
 (a) KCl (b) NaCl  
 (c) MgCl<sub>2</sub> (d) CaCl<sub>2</sub>

**PAST PAPERS MCQs**

- (116) In normal human body percentage of plasma in blood volume is: (DGK 2017)  
 (a) 45% (b) 30%  
 (c) 55% (d) 60%
- (117) In male human beings the amount of red blood cells per cubic millimeter is: (LHR 2017)  
 (a) 5 - 5 1/2 million (b) 4 - 4 1/2 million  
 (c) 6 - 6 1/2 million (d) 3 - 3 1/2 million
- (118) Plasma proteins constitute present by weight of plasma. (GRW 2017)  
 (a) 1-2 (b) 3-6  
 (c) 7-9 (d) 10-13
- (119) Which one of the following is not cell but the fragment of large cells (SWL 2017)  
 (a) Basophils (a) Leucocytes  
 (c) Platelets (d) Erythrocytes
- (120) A substance that inhibit blood clotting is: (MTN 2017)  
 (a) Heparin (b) Fibrinogen  
 (c) Fibrin (d) Thrombin

- (121) **Histamine is produced by:** (FSD 2019)  
 (a) Neutrophils (b) Eosinophils  
 (c) Basophils (d) Monocytes
- (122) **A substance that inhibits blood clotting is:** (LHR 2019)  
 (a) Heparin (b) Fibrinogen  
 (c) Fibrin (d) Thrombin
- (123) **A substance produce by basophils that inhibits blood clotting is:** (SWL 2019)  
 (a) Fibrinogen (b) Heparin  
 (c) Histamine (d) Globulin
- (124) **Basophils produce a substance that inhibits blood clotting:** (LHR 2019)  
 (a) Heparin (b) Platelets  
 (c) Fibrinogen (d) Eosinophil
- (125) **The mammalian red blood cells are:** (GRW 2019)  
 (a) Biconvex (b) Convex  
 (c) Concave (d) Biconcave
- (126) **How much of the cytoplasm of red blood cells have haemoglobin?** (DGK 2019)  
 (a) 91 % (b) 93 %  
 (c) 95 % (d) 97%
- (127) **Which type of white blood cell stays 10 to 20 hours blood then become macrophage:** (MTN 2021)  
 (a) Monocyte (b) Neutrophil  
 (c) Basophil (d) Eosinophil
- (128) **Percentage of red pigment the haemoglobin in cytoplasm of red blood cells is \_\_\_\_\_ %.** (GRW 2021)  
 (a) 95 (b) 90  
 (c) 85 (d) 80
- (129) **The average life span of red blood cells in human is about \_\_\_\_\_ month/months.** (GRW 2021)  
 (a) One (b) Two  
 (c) Three (d) Four
- (130) **It is estimated that in normal person's blood cells or cell like bodies constitute by volume of blood.** (GRW 2021)  
 (a) 55% (b) 50%  
 (c) 45% (d) 40%
- (131) **The weight of blood in a man of 60kg is:** (LHR 2022)  
 (a) 5 kg (b) 10 kg  
 (c) 15 kg (d) 20 kg
- (132) **From where the red blood cells are formed in a person at the age of 35:** (DGK 2022)  
 (a) Liver (b) Spleen  
 (c) Bone marrow (d) Stem cells in bone marrow
- (133) **The volume of plasma in 10L blood of man is:** (MTN 2022)  
 (a) 5.5 L (b) 7.5 L  
 (c) 9.5 L (d) 11.5 L
- (134) **Which of the following initates the process of blood clotting?** (RWP 2022)  
 (a) Conversion of fibrinogen to fibrin (b) Conversion of fibrin to fibrinogen  
 (c) Exposure of blood to air (d) By platelets

**ENTRY TEST BASED MCQs**

- (135) \_\_\_\_\_ proteins are produced by WBCs in response to \_\_\_\_\_ and provide immunity. (UHS 2022)  
 (a) Antibiotics, antigen (b) Antibodies, RBC  
 (c) Globulin, histamine (d) Antibodies, antigen
- (136) A type of blood cell that produces heparin is \_\_\_\_\_. (MDCAT 2017)  
 (a) Basophil (b) Eosinophil  
 (c) Neutrophil (d) Monocyte
- (137) Which of the following is agranulocyte cell? (MDCAT 2017-Retake)  
 (a) Neutrophil (b) Basophil  
 (c) Eosinophil (d) Lymphocyte
- (138) Which one of the following cells do not have nucleus? (MDCAT 2018)  
 (a) Eosinophils (b) Basophils  
 (c) Platelets (not a cell) (d) Neutrophils
- (139) The major function of Basophils is to: (MDCAT 2019)  
 (a) Destroy small particles by phagocytosis  
 (c) Release heparin to prevent blood clotting  
 (b) Inactivate inflammation producing substances  
 (d) Transport oxygen
- (140) Percentage of protein in human blood is: (MDCAT 2017-Retake)  
 (a) 1-2 (b) 7-9  
 (c) 7-10 (d) 6-9

**BLOOD DISORDERS****KIPS MCQs**

- (141) The uncontrolled production of white blood cells results in: (BWP 2017)  
 (a) Leucaemia (b) Oedema  
 (c) Thalassaemia (d) Lymphoma
- (142) Thalassaemia is also called: (LHR 2018)  
 (a) Cooley's anaemia (b) Thomas anaemia  
 (c) Peter's anaemia (d) Mendl's anaemia
- (143) Leucaemia is the result of uncontrolled production of: (FSD 2021)  
 (a) Leucocytes (b) Thrombocytes  
 (c) Erythrocytes (d) Platelets

**PUMPING ORGAN-THE HEART****KIPS MCQs**

- (144) Right atrium open into right ventricle by means of:  
 (a) Tricuspid valve (b) Bicuspid valve  
 (c) Semilunar valve (d) Mitral valve
- (145) Aortic valve closes:  
 (a) After the contraction of atria  
 (b) At the beginning of ventricular contraction  
 (c) During diastole  
 (d) At the end of ventricular contraction
- (146) Rhythmicity of heart is under control of:  
 (a) Somatic nervous system (b) Autonomic nervous system  
 (c) Peripheral nervous system (d) All of these
- (147) \_\_\_\_\_ chamber of the heart is comparatively smaller than the other side.  
 (a) Left atrium (b) Left ventricle  
 (c) Right ventricle (d) Right atrium

- (148) **Semilunar valve is present in base of:**  
 (a) Aorta (b) Pulmonary trunk  
 (c) Left atrioventricular septum (d) Both a & b
- (149) **The inner most layer of heart is called:**  
 (a) Epicardium (b) Myocardium  
 (c) Endothelium (d) Endocardium
- (150) **Papillary muscles attached with tricuspid valves are extensions of walls of:**  
 (a) Lt. atrium (b) Rt. Ventricle  
 (c) Lt. ventricle (d) Rt. Atrium
- (151) **The walls of left ventricle are \_\_\_\_\_ times thicker as compared to right ventricle.**  
 (a) 1 (b) 2  
 (c) 3 (d) 4
- (152) **Which of the following artery supplies blood to heart muscles?**  
 (a) Pulmonary (b) Coronary  
 (c) Systemic (d) None of these

**PAST PAPERS MCQs**

- (153) **The heart is enclosed in a double membranous sac called:** (LHR 2016)  
 (a) Epicardium (b) Myocardium  
 (c) Pericardium (d) Endocardium
- (154) **Atrioventricular valve present in left side of heart is:** (DGK 2019)  
 (a) Tricuspid (b) Bicuspid  
 (c) pulmonary (d) Semilunar
- (155) **The wall of left ventricle is thicker than that of right ventricle:** (MTN 2022)  
 (a) 1 time (b) 2 time  
 (c) 3 time (d) 4 time
- (156) **The right atrium receives deoxygenated blood from this part of the body\_\_\_\_\_.** (FSD 2022)  
 (a) Brain (b) Body  
 (c) Lungs (d) Kidney

**ENTRY TEST BASED MCQs**

- (157) **Bicuspid valve is present in which part of heart?** (MDCAT 2017-Retake)  
 (a) Right atrium and right ventricle (b) Left atrium and left ventricle  
 (c) Right atrium and left ventricle (d) Left atrium and right ventricle
- (158) **The thickest chamber of human heart is:** (MDCAT 2018)  
 (a) Left atrium (b) Right atrium  
 (c) Left ventricle (d) Right ventricle
- (159) **Which one of the following act as a pacemaker in heart?** (MDCAT 2018)  
 (a) Atria ventricular node (b) Sino-atrial node  
 (c) Atria ventricular bundles of fibers (d) Bundle of His
- (160) **Cardiac cycle lasts about:** (MDCAT 2017-Retake)  
 (a) 0.4 sec (b) 0.01 sec  
 (c) 0.8 sec (d) 0.5 sec
- (161) **Which statement is correct about atrial systole?** (MDCAT 2018)  
 (a) Atria relax and ventricles contract  
 (c) Atria contract and ventricle also contract  
 (b) Atria and ventricles are relaxed  
 (d) Ventricles remain relax while atria contract

## CARDIAC CYCLE, MECHANISM OF HEAR EXCITATION & CONTRACTION

### KIPS MCQs

- (162) The function of (a)V node in heart is:  
 (a) Delay the excitations before entering into the ventricles  
 (b) Receive excitations from atrium and supply it ventricles  
 (c) Initiate excitation in normal condition  
 (d) Both a & b
- (163) Dubb sound is made due to:  
 (a) Closing of atrioventricular valves  
 (b) Closing of semilunar valves  
 (c) Opening of semilunar valves  
 (d) Opening of atrioventricular valves
- (164) \_\_\_\_\_ is called the pace maker of the heart:  
 (a) S.A node  
 (b) V node  
 (c) V bundles  
 (d) Excitable fiber of ventricle
- (165) The delay of ventricular contraction that occurs due to (a)V node is about:  
 (a) 0.8 sec  
 (b) 0.15 sec  
 (c) 0.15 ms  
 (d) 0.5 sec
- (166) The duration of cardiac cycle is about:  
 (a) 0.8 sec  
 (b) 0.15 sec  
 (c) 0.15 ms  
 (d) 0.5 sec

### PAST PAPERS MCQs

- (167) One cardiac cycle is completed in: (RWP 2017)  
 (a) 0.3 Second  
 (b) 0.4 Second  
 (c) 0.8 Second  
 (d) 0.5 Second
- (168) One complete heart beat consists of one systole and one diastole which lasts for about: (FSD 2017, GRW 2018)  
 (a) 0.2 second  
 (b) 0.8 second  
 (c) 0.5 seconds  
 (d) 1.0 seconds
- (169) One complete heart beat lasts for: (MTN 2019)  
 (a) 1.0 sec  
 (b) 0.8 sec  
 (c) 0.5 sec  
 (d) 2.0 sec

## ELECTROCARDIOGRAM, ARTIFICIAL PACE MAKER, BLUE BABIES

### KIPS MCQs

- (170) P wave in ECG occurs:  
 (a) Just prior to atrial contraction  
 (b) Just after the contraction of ventricle  
 (c) Just prior to ventricular contraction  
 (d) Ventricular relaxation
- (171) In blue babies cyanosis occurs due to  
 (a) Mixing of blood between ventricle  
 (b) Mixing of blood between atria  
 (c) Mixing of blood in aorta & pulmonary artery  
 (d) Both 'b' & 'c'

## BLOOD VESSELS

### KIPS MCQs

- (172) Arteriosclerosis is caused by:  
 (a) Atheroma  
 (b) Advancing age  
 (c) Both of these  
 (d) None of these

- (173) **Flow of blood to heart through veins is facilitated by:**  
 (a) Muscle pump (b) Semilunar valves  
 (c) Gravity (d) Both a & b
- (174) **The Thrombus & Embolus are:**  
 (a) Blood clot (b) Plug of blood constituents  
 (c) Solid mass (d) All of these
- (175) **Atheroma is deposition of:**  
 (a) Platelets (b) Lipoid material  
 (c) Broken elastic fiber (d) R. BCs
- (176) **Exchange of material occur at:**  
 (a) Venues & capillaries (b) Arterioles & capillaries  
 (c) Capillaries only (d) Venues & arterioles
- (177) **Valves are present in:**  
 (a) Arteries and veins (b) Veins only  
 (c) Veins and capillaries (d) Arteries only
- (178) **Larger bore is present in:**  
 (a) Arteries (b) Veins  
 (c) Venues (d) Arterioles
- (179) **The total cross-sectional area is greatest in:**  
 (a) Capillaries (b) Aorta  
 (c) Arteries (d) Veins
- (180) **The velocity of blood flow is greatest in:**  
 (a) Capillaries (b) Aorta  
 (c) Arteries (d) Veins
- (181) **No pulse is observed in:**  
 (a) Capillaries (b) Arteries  
 (c) Veins (d) Both a & c
- (182) **Muscles and elastic fibers are absent in:**  
 (a) Capillaries (b) Aorta  
 (c) Arteries (d) Veins
- (183) **Thrombus in \_\_\_\_\_ may leads to myocardial infarction.**  
 (a) Aorta (b) Coronary artery  
 (c) Pulmonary artery (d) All of these
- (184) **The total cross sectional area is greatest in:**  
 (a) Capillaries (b) Aorta  
 (c) Arteries (d) Veins
- PAST PAPERS MCQs**
- (185) **Hepatic portal vein carries blood from:** (DGK 2019)  
 (a) Liver (b) Alimentary canal  
 (c) Kidneys (d) Lungs
- (186) **The arteries divide into smaller vessels called:** (MTN 2021)  
 (a) Veins (b) Venues  
 (c) Capillaries (d) Arteries
- (187) **The valves present in the veins are called:** (RWP 2019, SDG 2021)  
 (a) Bicuspid (b) Semi-lunar  
 (c) Tricuspid (d) Aortic
- (188) **The renal vein brings the impure blood from \_\_\_\_\_.** (BWP 2022)  
 (a) Brain (b) Kidney  
 (c) Lungs (d) Liver

**ENTRY TEST BASED MCQs**

- (189) Flow of blood in the capillaries is adjusted by: (UHS 2022)  
 (a) Heart directly (b) Pre-capillary sphincters  
 (c) Meta-arteriole (d) Valves
- (190) Elastic fibers are absent in the walls of \_\_\_\_\_. (MDCAT 2017)  
 (a) Aorta (b) Veins (correct in key)  
 (c) Arteries (d) Capillaries

**BLOOD PRESSURE & RATE OF BLOOD FLOW****PAST PAPERS MCQs**

- (191) In myocardial infarction, which organ is affected: (LHR 2021)  
 (a) Lungs (b) Eye  
 (c) Kidney (d) Heart
- (192) Discharge of blood from blood vessel is called as: (BWP 2021)  
 (a) Stroke (b) Heart attack  
 (c) Thrombosis (d) Haemorrhage
- (193) Match heart attack with one of the following: (RWP 2021)  
 (a) Stroke (b) Oedema  
 (c) Hypertension (d) Myocardial infarction
- (194) Disruption of control system of the heart leads to: (SGD 2022)  
 (a) Hypertension (b) Heart attack  
 (c) Stroke (d) Hemorrhage

**LYMPHATIC SYSTEM****KIPS MCQs**

- (195) System responsible for the transport of materials from body tissue to blood:  
 (a) Blood vascular system (b) Lymphatic system  
 (c) Immune system (d) Circulatory system
- (196) The correct pathway of passage of lymph:  
 (a) Interstitial fluid → lymph vessel → lymphatics → lymph node  
 (b) Interstitial fluid → lymph node → lymph vessel → lymphatics  
 (c) Interstitial fluid → lymphatics → lymph node → lymph vessel  
 (d) Interstitial fluid → lymph vessel → lymph node → lymphatics
- (197) The flow of lymph is maintained by:  
 (a) Activity of skeletal muscles (b) Movement of viscera  
 (c) Breathing movements (d) All of these
- (198) In humans lymph nodes are mostly present in:  
 (a) Neck (b) Axilla  
 (c) Groin (d) All of these
- (199) Which one is not a lymphoid mass?  
 (a) Tonsils (b) Spleen  
 (c) Thyroid (d) None of these
- (200) Which is not the function of lymphatic system?  
 (a) Absorption of material from lymph (b) Defend against diseases  
 (c) Absorption of digested fats (d) Transport lymph to circulatory system
- (201) Lymph is a fluid in transit between:  
 (a) Interstitial fluid & blood (b) Blood & plasma  
 (c) Interstitial fluid & plasma (d) None of these

(202) The flow of lymph is maintained by:

- (a) Activity of skeletal muscles  
(b) Movement of viscera  
(c) Breathing movements  
(d) All of these

#### PAST PAPERS MCQs

(203) Lymph vessels empty in:

- (a) Arteries  
(b) Arteriole  
(c) Capillaries  
(d) Vein

(DGK 2021)

#### ENTRY TEST BASED MCQs

(204) The lymphatic vessels of the body empty the lymph into blood stream at: (UHS 2022)

- (a) Abdominal vein  
(b) Jugular vein  
(c) Sub-clavian vein  
(d) Bile duct

(205) Thoracic lymph duct of the lymphatic system opens into \_\_\_\_\_. (MDCAT 2017)

- (a) Superior vena cava  
(b) Inferior vena cava  
(c) Subclavian vein  
(d) Renal vein

(206) Large lymph vessels ultimately form larger lymph duct, which drains its lymph into: (MDCAT 2019)

- (a) Carotid and Aorta  
(b) Subclavian Vein  
(c) Subclavian artery  
(d) Vena cava and Aorta

### IMMUNITY AND ITS TYPES

#### KIPS MCQs

(207) Vaccination is the example of:

- (a) Artificial Active immunity  
(b) Natural Active immunity  
(c) Artificial passive immunity  
(d) Natural passive immunity

(208) In case of snake bite venom passive immunity is produced by the antitoxin, so the serum is called:

- (a) Antiserum  
(b) Antitoxin  
(c) Antivenom  
(d) Anti snake bite

(209) An antibody molecule consists of \_\_\_\_\_ polypeptide chains.

- (a) 2  
(b) 4  
(c) 5  
(d) 6

(210) Heavy and light chains of antibodies are held together by:

- (a) Hydrogen bonds  
(b) Ionic bonds  
(c) Disulphide bonds  
(d) All of these

(211) Receptor site of an antibody for germs consist of:

- (a) Variable site of heavy chain  
(b) Constant and variable site of heavy chain  
(c) Consist site of light and heavy chain  
(d) Variable site of heavy and light chain

(212) Bursa of Fabricius is:

- (a) Lymphoid tissue present in mammals  
(b) A part of respiratory system of birds  
(c) Present in bird and is a lymphoid tissue  
(d) A site where E lymphocytes are broken down

(213) Cell mediated response is a characteristic of:

- (a) B lymphocytes  
(b) T cells  
(c) Monocytes  
(d) Basophils

(214) Antibodies are produced by:

- (a) B cells  
(b) T cells  
(c) Granulocytes  
(d) Plasma clone cells



- (215) **Phagocyte act as:**  
 (a) 1<sup>st</sup> line of defense (b) 2<sup>nd</sup> line of defense  
 (c) 3<sup>rd</sup> line of defense (d) 4<sup>th</sup> line of defense
- (216) **An Immunogen is:**  
 (a) Globular protein to kill antigens  
 (b) A foreign particle which stimulate the production of antibodies  
 (c) A plasma protein for clotting  
 (d) Produced by plasma clone cells
- (217) **Antibodies are produced by:**  
 (a) T cells (b) T helper cells  
 (c) B cells (d) None of these

**PAST PAPERS MCQs**

- (218) **Passive immunity is developed by injecting:** (LHR 2018)  
 (a) Vaccine (b) Serum  
 (c) Antiserum (d) Antibiotics
- (219) **Antiserum is a serum containing:** (LHR 2017, MTN 2017, MTN 2019)  
 (a) Hormones (b) Antigen  
 (c) Enzyme (d) Antibodies
- (220) **Immunoglobulins present in plasma play a role in:** (MTN 2021)  
 (a) Defense against disease (b) Water balance  
 (c) Transport O<sub>2</sub> (d) Salt balance
- (221) **It is a third mechanism to defend the body against the foreign invaders is:** (LHR 2021)  
 (a) Skin (b) Mucous membranes  
 (c) Phagocytes (d) Immune system
- (222) **Which of the following is not a part of human immune system?** (RWP 2022)  
 (a) Antibody (b) Antigen  
 (c) B – lymphocyte (d) T – lymphocyte

**ENTRY TEST BASED MCQs**

- (223) **The antibody molecule consists of \_\_\_\_\_ polypeptide chains:** (MDCAT 2017)  
 (a) Eight (b) Six  
 (c) Four (d) Two
- (224) \_\_\_\_\_ **cells survive for a few days and secrete a huge no of antibodies in blood, tissue fluids or lymph.** (MDCAT 2017)  
 (a) Memory cells (b) T-lymphocytes  
 (c) B-lymphocytes (d) Plasma cells
- (225) **The intermediate protection from infection of snake bite can be obtained by:** (MDCAT 2017)  
 (a) Active Immunity (b) Passive immunity  
 (c) Natural active immunity (d) Vaccination
- (226) **How many polypeptide chains are present in an typical antibody structure:** (MDCAT 2017-Retake)  
 (a) 1 (b) 3  
 (c) 2 (d) 4
- (227) **Vaccination is:** (MDCAT2017-Retake)  
 (a) Natural active immunity (b) Artificial active immunity  
 (c) Natural passive immunity (d) Artificial passive immunity

- (228) Cell mediated immune response is given by: (MDCAT 2018)  
(a) Neutrophils (b) Macrophages  
(c) T-lymphocytes (d) B-lymphocytes
- (229) Antivenom given after a snake bite venom is an example of: (MDCAT 2018)  
(a) Artificial active immunity (b) Artificial passive immunity  
(c) Natural active immunity (d) Natural passive immunity
- (230) In immunoglobulins/antibodies, two light chains and two heavy chains are linked to each other by: (MDCAT 2018)  
(a) Covalent bonds (b) Disulphide bonds  
(c) Hydrogen bonds (d) Ionic bonds
- (231) Now-a-days every new born gets regular shots of vaccine for polio. It contains \_\_\_\_\_ for polio to make a child immune against this disease. (MDCAT 2019)  
(a) Antisera (b) Antibiotics  
(c) Antibodies (d) Antigens
- (232) A person got an infection, he became ill but then he survived. What do you think which type of immunity he would have developed?  
(a) Naturally induced active immunity (b) Active immunity  
(c) Artificially induced active immunity (d) Passive immunity

**ANSWER KEY**

(Topic-Wise Multiple Choice Questions)

1		31	a	61	b	91	b	121	c	151	c	181	d	211	d
2		32	b	62	c	92	c	122	a	152	b	182	a	212	c
3		33		63	c	93	b	123	b	153	c	183	b	213	b
4		34		64	d	94		124		154		184	a	214	d
5		35		65	b	95	b	125		155		185		215	D
6		36		66	a	96	a	126		156		186		216	a
7		37	b	67	d	97		127		157	c	187		217	D
8		38	b	68	d	98	d	128		158	c	188	b	218	c
9		39	a	69	c	99		129		159	b	189	b	219	
10		40		70	b	100		130		160	c	190	b	220	
11		41		71	a	101	c	131		161	d	191		221	
12	b	42	c	72		102	c	132		162	d	192	d	222	
13	c	43		73	a	103	b	133		163	b	193	d	223	c
14	c	44		74	b	104	c	134		164	a	194		224	d
15	c	45	c	75	d	105	b	135	d	165	b	195	b	225	b
16	b	46		76	a	106	b	136	a	166	a	196	c	226	d
17	c	47		77	a	107	a	137	d	167	c	197	d	227	b
18	a	48		78	c	108	a	138	c	168	b	198	d	228	c
19	c	49		79	d	109	d	139	c	169	b	199	d	229	b
20	c	50		80	d	110	c	140	b	170	a	200	a	230	b
21	a	51	b	81	a	111	d	141	a	171	b	201	a	231	d
22	b	52		82	a	112	c	142		172	c	202	d	232	a
23		53		83	d	113	b	143		173	d	203			
24	b	54		84	c	114	a	144	a	174	d	204	c		
25		55	b	85		115	b	145	d	175	b	205	c		
26		56		86		116	d	146	b	176	c	206	b		
27		57		87	b	117	a	147	b	177	b	207	a		
28		58		88	b	118	c	148	d	178	b	208	c		
29	c	59		89	d	119	c	149	d	179	a	209	b		
30	b	60	d	90	d	120	c	150	b	180	b	210	c		

**KIPS SHORT QUESTIONS****INTRODUCTION, UPTAKE OF MINERAL AND WATER BY PLANTS****KIPS QUESTIONS**

**Q:1 Define transport. What is its need?**

**Ans: Definition:**

The movement of any object from one place to another with help or without help of other body is known as transport.

**Need:**

It is the main requirements in living organisms for distribution of nutrients and removal of wastes.

**Q:2 Define facilitated diffusion. How does it differ from diffusion?**

**Ans: Facilitated Diffusion:**

Facilitated diffusion is a type of diffusion in which carrier molecules within the cell membrane transport nutrients across the membrane. The carrier molecules are proteins, which are present with cell membranes of epidermal and other root cells.

**Difference from Diffusion:**

It is facilitated with carrier proteins while diffusion is spontaneous process.

**Q:3 Define incipient plasmolysis.**

**Ans:** The point at which plasmolysis is just about to happen is called incipient plasmolysis.

A incipient plasmolysis the protoplast has just stopped to exert any pressure against the cell wall.

**Q:4 What is osmotic potential?**

**Ans:** The osmotic potential is a measure of the change in water potential of a system due to the presence of solute molecules. Osmotic potential is always negative and if more solute molecules are present more negative is the osmotic potential.

**Q:5 Why animal cells cannot withstand a higher pressure potential?**

**Ans:** The animal cells cannot withstand higher pressure potential as there is no cell wall around protoplast. Thus the turgid cells burst in a solution of higher water potential.

**Q:6 What is kPa?**

**Ans:** kPa is equivalent to 1000 Pascals. It is the pressure exerted by a vertical force of one Newton on an area of 1 meter square.

**Q:7 What is an apoplast pathway?**

**Ans:** It is the pathway involving system of adjacent cell walls which is continuous throughout the plant roots. In the roots apoplast pathway becomes discontinuous in the endodermis due to the presence of Casparian strips.

**Q:8 Define plasmolysis and deplasmolysis.**

**Ans: Plasmolysis**

Plasmolysis is the shrinkage of protoplast due to exosmosis of water and such a cell is called plasmolysed cell.

**Deplasmolysis**

Return of cell from plasmolysed state to its original form is called deplasmolysis and such a cell is called deplasmolysed cell.

**PAST PAPERS QUESTIONS**

**Q:9** Differentiate between active transport and facilitated diffusion.

(SGD 2017)

**Q:10** Define Osmosis

(MTN 2017)

**ASCENT OF SAP AND TRANSPIRATION****KIPS QUESTIONS****Q:11 How xylem walls are strengthened?****Ans:** The lignin and cellulose provide strength to cell wall of xylem vessels. Therefore, the xylem walls have high tensile strength.**Q:12 What are different factors involved in movement of  $K^+$  ions in and out of guard cells?****Ans:** The level of carbon dioxide in the spaces inside the leaf and light control  $K^+$  ion movement into the guard cells.

- Low level of carbon dioxide favour opening of the stomata thus allowing an increased carbon dioxide level and increased rate of photosynthesis.
- Exposure to the light acidify the environment of the guard cell by pumping out  $H^+$  ions which enable the guard cells to take up  $K^+$  followed by water uptake resulting in increased turgidity of guard cells so the stoma are open.
- Vice versa.

**Q:13 Define hydathodes and what are their functions?****Ans:** Hydathodes are water secreting glands through which loss of liquid water or guttation takes place.**Q:14 Differentiate between Cuticular and Lenticular transpiration.****Ans:**

Cuticular Transpiration	Lenticular Transpiration
The loss of water in the form of water vapours through the cuticle of leaves is called cuticular transpiration.	The loss of water vapours through lenticels (aerating pores formed in the bark) present in the stem of some plants is called lenticular transpiration.
About 5-7% of total transpiration takes place through this route.	It is 1-2% of the total transpiration by a plant.

**Q:15 What is meant by root pressure?****Ans:** Active secretion of salts from the other cells into the xylem sap lowers the water potential of the xylem sap, therefore water enters xylem cells by osmosis increasing the level of sap and hydrostatic pressure in xylem cells which pushes the water upwards. It is root pressure and is the second force involved in ascent of sap however the sap in the xylem does not rise to enough height in most plants. Also the root pressure is least effective during day when transpiration pull is active.**Q:16 What is guttation? What does it differ from transpiration?****Ans: Guttation:**

Guttation or exudation is loss of liquid water through water secreting glands called hydathodes.

**Difference with Transpiration**

Guttation	Transpiration
It occurs through hydathodes.	It commonly occurs through stomata.
Water is secreted.	Water is evaporated.

**Q:17 Describe the contribution of Sacks in biology.****Ans:** Sacks in 1874 suggested that the water molecules move along the cell walls of xylem vessels due to imbibition.

Imbibition forces (like dry cell wall and thicker protoplasm) may develop in the plant body. The dry cell walls can attract and absorb large amount of water. The amount of water in the protoplasm is also increased.

**Q:18 Define imbibitions.**

**Ans:** Imbibition is a process in which the colloidal particles in the soil or cell wall components take up water and it binds to surfaces of these particles. It has been suggested that water moves along the cell walls of xylem vessels due to imbibition. The cell wall components especially cellulose, pectin and lignin and protoplasm can take up water; swell and increase in volume. However, they do not dissolve in water. Imbibition is a reversible process and when water is lost the original volume of the cell wall and protoplasm is restored.

**Q:19 What is bleeding in plants? What factors are responsible for bleeding?**

**Ans: Bleeding:**

Sometimes it so happens that certain plants, when cut, or otherwise wounded, show a flow of sap from the cut ends or surfaces quite often with a considerable force. This phenomenon is called bleeding.

**Factors:**

There are two main factors responsible for bleeding:

- (1) The hydrostatic pressure in xylem and phloem elements.
- (2) The root pressure which is exerted by the xylem tissues of roots

**Q:20 What is a lenticel?**

**Ans:** Lenticels are aerating pores formed in the bark through which exchange of gases takes place and water is lost in the form of water vapours (Transpiration). Externally they appear as scars or small protrusions on the surface of stem. Lenticels consist of a loose mass of small, thin-walled cells. At each lenticel the cork cambium forms oval, spherical or irregular cells which are very loosely arranged, having lot of intercellular spaces.

**Q:21 Define transpiration. Enlist its types.**

**Ans: Transpiration:**

The evaporation of water from the aerial parts of the plant especially through stomata of leaves is a process called transpiration.

Transpiration has very important role in the ascent of sap.

**Types:** There are three types of transpiration depending upon the route of escape of water vapours from the aerial parts of the plant

- (1) Cuticular transpiration
- (2) Lenticular transpiration
- (3) Stomatal transpiration

**Q:22 Enlist various benefits of transpiration.**

**Ans:**

- (1) It helps in ascent of sap.
- (2) It provides cooling effect to plant body.

### **PAST PAPERS QUESTIONS**

- Q:23** What is guttation? (FSD 2017)  
**Q:24** What is bleeding in Plants? (MTN 2017)  
**Q:25** What is meant by bleeding in plants? (DGK 2017, SGD 2017)  
**Q:26** What is lenticular transpiration? (DGK 2017)  
**Q:27** How guttation differ from imbibition? (RWP 2017)

### **TRANSLOCATION**

#### **TIPS QUESTIONS**

**Q:28 State pressure flow theory.**

**Ans:** Pressure flow theory states that the flow of solution in the sieve elements is driven by an osmotically generated pressure gradient between source and sink.

**Q:29** Enlist all the types of cells in the phloem tissues.

**Ans:**

- (1) Sieve elements
- (2) Phloem parenchyma cells
- (3) Companion cells
- (4) Some fibers, sclereids and latex containing cells.

### PAST PAPERS QUESTIONS

**Q:30** How sieve tubes and companion cells communicate?

(DGK 2017)

### TRANSPORTATION IN ANIMALS

#### KIPS QUESTIONS

**Q:31** Give the names of three main blood vessels and their functions in earthworm.

**Ans:** The three main blood vessels in earthworm are:

- Dorsal blood vessel that collects blood from the 14th segment backwards.
- Ventral blood vessel which is chief distributing vessel with backward flow.
- Subneural vessel which is a collecting vessel.

**Q:32** What is closed circulatory system?

**Ans:** It is a type of blood circulatory system in which blood always remains in the blood vessels, and does not come in direct contact with other cells of the body.

Closed circulatory system is found in annelids, cephalopod mollusks (squids and octopus), echinoderms and vertebrates.

### VERTEBRATE BLOOD CIRCULATORY SYSTEM

#### KIPS QUESTIONS

**Q:33** What is a single circuit heart? Give example.

**Ans:** Type of heart through which only one type of blood flows is called single circuit heart e.g. as in fishes.

**Q:34** State the pathway of blood in a single circuit heart.

**Ans:** Type of heart through which only one type of blood flows is called single circuit heart e.g. as in fishes.

Sinus venosus receives deoxygenated blood from the body. This blood is passed first to atrium and then to ventricle. Ventricle has thick muscular wall, which on contraction pushes blood to ventral aorta via conus arteriosus. Ventral aorta carries blood to gills, where oxygenation of blood occurs. This oxygenated blood is distributed to body via dorsal aorta.

**Q:35** What is pulmonary circulation?

**Ans:** Circulation of blood between heart and lungs is called pulmonary circulation.

It is as follows.

Deoxygenated blood from different body parts returns to right atrium. Right atrium pushes this blood to right ventricle, from where pulmonary arteries carry this deoxygenated blood to lungs for oxygenation. From lungs oxygenated blood is carried to left atrium by pulmonary veins. Left atrium pushes this blood to left ventricles from which blood is supplied to aorta.

### PAST PAPERS QUESTIONS

**Q:36** Differentiate between pulmonary circulation and systemic circulation.

(SWL 2017)

**Q:37** Differentiate between single circuit and double circuit heart.

(FSD 2017)

**Q:38** Differentiate between systematic and pulmonary circulation.

(DGK 2017)

**TRANSPORT IN MAN, BLOOD****KIPS QUESTIONS****Q:39** What are different functions of plasma proteins?**Ans:**

- (1) Provide defence against diseases
- (2) Maintain viscosity
- (3) Facilitate transport of materials
- (4) Clotting of blood

**Q:40** What are the salient features of thalassaemia?

**Ans:** It is characterized by the presence of microcytes by splenomegaly (enlargement of spleen) and by changes in the bones and skin. This disease is more common in children especially of Mediterranean parents. The blood of these patients is to be replaced regularly, with normal blood.

**Q:41** Give the role of platelets.

**Ans:** They are involved in blood clotting. They help in conversion of soluble plasma fibrinogen into insoluble fibrin. The fibrin threads enmesh red blood cells and other platelets in the area of damaged tissue forming a blood clot. The clot serves as a temporary seal to prevent bleeding until the damaged tissue can be repaired.

**Q:42** Give two important chemicals produced by basophils what function do they perform?**Ans:** Basophils releases;

- Heparin to prevent blood clots and
- Histamine, which causes inflammation.

**HEART****KIPS QUESTIONS****Q:43** What are blue babies?

**Ans:** Failure of interatrial foramen (an opening present in the inter-atrial septum) to close or of ducts arteriosus to fully constrict results in cyanosis (blueness of skin) of new born. This is due to mixing of blood between two atria and the mixed blood is supplied to the body of newborn babies resulting in blueness of skin-thus the name blue babies.

**PAST PAPERS QUESTIONS****Q:44** What are blue babies?

(LHR 2017, SWL 2017, RWP 2017)

**BLOOD VESSELS****KIPS QUESTIONS****Q:45** What do you know about vein?

**Ans:** Veins are blood vessels that transport blood from body cells towards heart. The walls of veins have three layers, but the middle layer is relatively thin and slightly muscular with few elastic fibres. The semilunar valves are present in veins which prevent the back flow of blood as it is moving towards the heart.

**Q:46** Define hypertension.

**Ans:** It is a condition of high blood pressure. Prolonged high blood pressure damages the lining vessels and also leads to weakening of heart muscles, with declining efficiency of its pumping action.

**Q:47** What is atherosclerosis?

**Ans:** Artherosclerosis is a degenerative arterial change in which thickening of middle layer of arteries takes place leading to narrowing and hardening of arteries. This increases the risk of formation of thrombus. The disease is because of old age.



**Q:48 Differentiate between an artery and a vein.**

**Ans:**

Artery	Vein
Artery is a blood vessel which carries blood away from the heart to different parts of the body. The wall of the artery is made up of three layers. <ul style="list-style-type: none"> <li>• Outer, (made of connective tissue and elastic fibres)</li> <li>• Middle (made of thick muscular tissue and elastic fibres) and</li> <li>• Inner, endothelium.</li> </ul>	Vein is a blood vessel which carries blood from body cells towards heart. The wall of veins has same three layers as are present in artery.

**PAST PAPERS QUESTIONS**

- Q:49** Define heart attack and give its causes. (GRW 2017)
- Q:50** What are the preventive measures for the eradication of hemorrhage problems? (DGK 2017)
- Q:51** What is Haemorrhage? Give its cause. (BWP 2017)
- Q:52** Differentiate between Thrombus and Embolus. (BWP 2017, LHR 2017)
- Q:53** Define stroke and write its effects. (RWP 2017)

**LYMPHATIC SYSTEM  
IMMUNITY**

**KIPS QUESTIONS**

**Q:54 Explain immunity and give its types.**

**Ans:** The capacity to recognize entry of any foreign material into the body and to mobilize cells and cell products to help remove the particular sort of foreign material with greater speed and effectiveness is called immunity. The immunity may be active immunity or passive immunity.

- (1) Active Immunity: The use of vaccines, which stimulate the production of antibodies in the body and make a person immune against the disease, is called active immunity.
- (2) Passive Immunity: The antibodies are introduced in the form of antisera. Passive immunity response is immediate but not long lasting.

**Q:55 What is difference between antigen and antibody?**

**Ans:**

Antigen	Antibody
Antigen or immunogen is a foreign substance, often a protein which stimulates the formation of antibodies.	Antibodies are proteinaceous substances that are specific and cause the destruction of the antigens, which stimulated their production.

**PAST PAPERS QUESTIONS**

- Q:56** What is humoral immune response? (LHR 2017)
- Q:57** Define antigen and antibody. (GRW 2017)
- Q:58** Define active and passive immunity. (RWP 2017)