BIOLOGY

Worksheet-14

STEP

A PROJECT BY PUNJAB GROUP

Worksheet-14 (i)

(Gas Exchange)

Q.1 Air passageways of human being consist of following parts EXCEPT:

A) Nostrils and nasal cavities

B) Bronchi, bronchioles and alveolar ducts

C) Pharynx, larynx and trachea

D) Air sacs and alveoli

Q.2 Both nasal cavities are collectively sub divided into:

A) Three passageways

B) Five passageways

C) Four passageways

D) Six passageways

Q.3 Each nasal cavity is sub divided into three passageways by the projection of bones from the walls of the:

A) External nose C) Middle nose

B) Internal nose D) Posterior nose

Q.4 The nasal cavity leads into the throat or pharynx by:

A) Three internal openings

B) Two internal openings

C) Four internal openings

D) Five internal openings

Q.5 The larynx or voice box is a complex cartilaginous structure surrounding the:

A) Upper end of trachea

B) Upper end of pharynx

C) Lower end of trachea

D) Upper end of bronchi

Q.6 One of the cartilage has a muscularly controlled hinge like action and serves as a lid which automatically covers the opening of the larynx and is called:

A) Glottis C) Voice box

B) Epiglottis D) Vocal cord

Q.7 Glottis is the opening of:

A) Larynx C) Trachea

B) Pharynx D) Windpipe

Q.8 In the glottis the mucous membrane is stretched across into two thin edged fibrous bands called:

A) Vocal cords C) Nerve cords

B) Epiglottis D) Notochord

Q.9 The commonly held belief that the epiglottis closes downward upon the larynx when food is swallowed is:

A) Quite true C) Not quite true

B) Quite wrong D) Quite baseless

Q.10 The degree of closure of larynx is determined partly by:

A) Backward movement of the tongue

B) Upward movement of the larynx

C) Backward movement of the tongue and upward movement of the larynx

D) Backward movement of the larynx and upward movement of the tongue

Q.11 What forces the epiglottis into more or less horizontal position:

A) Forward movement of the tongue

B) Upward movement of the larynx

C) Backward movement of the tongue

D) Downward movement of the larynx

Q.12 Food does not enter the partly open larynx and obstruct breathing primarily because the:

A) Epiglottis diverts the food mass to one side of the opening

B) Esophageal sphincter is contracted

C) Esophageal sphincter is relaxed

D) Glottis is so narrow to receive the food

Q.13 Trachea upon entering into the thorax divides into:

A) Right and left bronchi
B) Upper and lower bronchi
C) Dorsal and ventral bronchi
D) Smaller and larger bronchi

Q.14 These are mainly made up of circular smooth muscles:

A) Larynx C) Bronchi
B) Trachea D) Bronchioles

Q.15 These continue to divide and sub divide deep into the lungs and finally open into a large number of air sacs:

A) Larynx C) Bronchi
B) Trachea D) Bronchioles

Q.16 Pleural membranes line the part of the thoracic cavity containing the lungs, so the lungs are in the:

A) Pleural cavity C) Thoracic cage
B) Rib cage D) Diaphragm

Q.17 Air enters the lungs from the oral cavity or nasal passages via trachea and bronchi and eventually reaches the:

A) Air sacs C) Bronchioles
B) Alveoli D) Thoracic cavity

Q.18 These are the organs placed in the chest cavity:

A) Air sacs C) Thorax
B) Alveoli D) The lungs

Q.19 Chest cavity is bound on sides by:

A) Ribs C) Ribs and Muscles
B) Muscles D) Diaphragm

Q.20 C shaped cartilaginous rings present in the wall of trachea prevent it from:

A) Bending
B) Collapsing
C) Opening
D) Changing its diameter

Q.21 Lungs are covered with double layered thin membranous sac called:

A) Air sacs C) Pleura
B) Alveoli D) Rib cage

Q.22 An uninterrupted supply of energy is required for activities at:

A) Cell level
B) Organs level
C) Tissue level
D) Cell, Organs and Tissue levels

Q.23 It is the process by which cell utilizes oxygen, produces carbon dioxide, extracts and conserves the energy:

A) Organismic respiration
B) Breathing
C) External Respiration
D) Cellular respiration

Q.24 In human being respiratory pigment is:

A) Myoglobin C) Hemocyanin
B) Hemoglobin D) Oxyhaemoglobin

Q.25 It is contained in the red blood cells:

A) Myoglobin C) Hemocyanin
B) Hemoglobin D) Phycoerythrin

Q.26 Oxyhemoglobin is unstable and splits into the normal purple red colored hemoglobin and oxygen in the condition of:

A) Low oxygen concentration and less pressure
B) Low oxygen concentration and more pressure
C) High oxygen concentration and more pressure

D) High oxygen concentration and low pressure

Q.27 Carbonic anhydrase enzyme present in R.B.C facilitates:

A) Splitting up of oxyhemoglobin

B) Splitting up of carboxyhemoglobin

C) Formation of hemoglobin

D) Formation of carboxyhemoglobin

Q.28 The maximum amount of oxygen which normal human blood absorbs and carries at sea level is about:

A) 19.6 ml/100 ml of blood

B) 20 ml/98 ml of blood

C) 20 ml/100 ml of blood

D) 19.6 ml/98 ml of blood

Q.29 Under normal conditions, blood of alveoli of the lungs is:

A) Completely oxygenated

B) Not oxygenated at all

C) Not completely oxygenated

D) Over oxygenated

Q.30 At oxygen tension of 115 mm mercury the hemoglobin will carry oxygen as given below:

A) 20 ml / 100 ml of blood

B) 21 ml / 100 ml of blood

C) 19.6 ml / 100 ml of blood

D) 22 ml / 100 ml of blood

Q.31 When oxygen pressure falls below 60 mm mercury in any cell and tissue, the oxygen saturation of hemoglobin:

A) Increases very sharply

B) Increases slowly

C) Decreases very sharply

D) Decreases slowly

Q.32 For a scuba diver to breathe, the oxygen pressure should be:

A) Same as at sea level

B) Lesser than that at sea level

C) Greater than that at sea level

D) Inversely proportional to the depth

Q.33 The oxygen carrying capacity of hemoglobin is decreased by:

A) Deceasing carbon dioxide pressure

B) Decreasing temperature of the blood

C) Decreasing pH of the blood

D) Increasing pH of the blood

Q.34 The oxygen carrying capacity of hemoglobin is increased by:

A) Increasing carbon dioxide pressure

B) Increasing temperature of the blood

C) Increasing pH of the blood

D) Decreasing pH of the blood

Q.35 The capacity of hemoglobin to hold oxygen becomes less by:

A) Increasing oxygen tension

B) Increasing pH of the blood

C) Decreasing temperature of the blood

D) Increasing carbon dioxide pressure

Q.36 Increased carbon dioxide tension favors the:

A) Greater liberation of oxygen from the tissue to the blood

B) Greater liberation of oxygen from the blood to the tissues

C) Lesser liberation of oxygen from the blood to the tissues

D) Greater liberation of carbon dioxide from the blood of the tissues

Q.37 What results in a decreased ability of hemoglobin to bind oxygen:

A) Decreased pH

B) Increased hydrogen ion concentration

C) Combination of hydrogen ions with protein part of hemoglobin

D) Low temperature

Q.38 As regulator of alveolar ventilation carbon dioxide is much important in:

A) Conditions of shock

B) Conditions of emergency

C) Conditions of shock and emergency

D) Normal conditions

Q.39 The carbon dioxide carried as carboxyhemoglobin is _____ of the total carried by blood.

A) 5% C) 20%

B) 70% D) 5%

Q.40 The carbon dioxide carried by other plasma proteins is:

A) 5% C) 20%

B) 70% D) 5%

Q.41 The maximum amount of CO_2 is carried by blood as:

A) Carboxyhemoglobin

B) Dissolved in plasma

C) Bicarbonate ion

D) Combined with potassium

Q.42 The carbon dioxide carried as bicarbonate ions is combined with:

A) Potassium C) Sodium

B) Calcium D) Magnesium

Q.43 Pick up the chemical change promoted by carbonic anhydrase enzyme:

A) $HbO \longrightarrow Hb + O_2$

B) $H^+ + HCO_3^- \longrightarrow H_2CO_3$

C) $H_2CO_3 \longrightarrow H^+ + HCO_3^-$

D) $H_2CO_3 \longrightarrow CO_2 + H_2O$

Q.44 What occurs finally in blood capillaries of tissues:

A) $HCO^- + H^+ \longrightarrow H_2CO_3$

B) $H_2CO_3 \longrightarrow CO_2 + H_2O$

C) $CO_2 + H_2O \longrightarrow H_2CO_3$

D) $Hb + O_2 \longrightarrow HbO_2$

Q.45 What occurs in blood capillaries surrounding the alveoli:

A) $CO_2 + H_2O \longrightarrow H_2CO_3$

B) $Hb + O_2 \longrightarrow HbO_2$

C) $H_2CO_3 \longrightarrow CO_2 + H_2O$

D) $HCO_3 + H^+ \longrightarrow H_2CO_3$

Q.46 It diffuses out from the capillaries of the lungs into space of alveolar sac:

A) Oxygen

B) Carbon dioxide

C) Carboxyhemoglobin

D) Oxyhemoglobin

Q.47 It diffuses out from the alveolar sac into the capillaries of the lungs:

A) Oxygen

B) Carbon dioxide

C) Carboxyhemoglobin

D) Oxyhemoglobin

Q.48 Small amount of carbon dioxide is also carried by corpuscles by combining with:

A) Sodium C) Calcium

B) Potassium D) Magnesium

Q.49 How much amount of CO_2 is given off by blood while passing through the lungs per 100 ml of blood:

A) 20ml C) 54ml

B) 50ml D) 4ml

Q.50 It is a process in which fresh air containing more oxygen is pumped into lungs:

A) Internal respiration C) Breathing

B) Cellular respiration D) Assimilation

Q.51 A mechanical process consisting of two phases is:

A) Internal respiration C) Breathing

B) Cellular respiration D) Assimilation

Q.52 Breathing is a mechanical process consisting of:

A) Two phases C) Four phases

B) Three phases D) Five phases

Q.53 A phase in which fresh air moves into the lungs is called:

A) Expiration

B) Ventilation

C) Inspiration

D) External respiration

Q.54 A phase in which air with low O_2 and high CO_2 content moves out of the lungs is called:

A) Expiration

B) Ventilation

C) Inspiration

D) External respiration

Q.55 To understand the mechanism of breathing, we should keep in mind _____ aspects related to lungs and associated structures.

A) Three C) Five

B) Four D) Six

Q.56 Pick up the correct statement about lungs:

A) During inspiration active expansion takes place

B) During expiration active contraction takes place

C) During inspiration passive contraction takes place

D) During expiration passive contraction takes place

Q.57 The shape of diaphragm is more dome like:

A) At day time

B) When its muscles relaxed

C) When its muscle contract

D) At night time

Q.58 The shape of diaphragm becomes less dome like:

A) At day time

B) When its muscles are relaxed

C) When its muscle contract

D) At night time

Q.59 Walls of chest cavity are composed of:

A) Ribs

B) Diaphragm

C) Intercostal muscles

D) Ribs and intercostal muscles

Q.60 Ribs are elevated, when:

A) Muscles between the ribs contract

B) Muscles of the lungs contract

C) Muscles between the ribs are relaxed

D) Muscles of the diaphragm are relaxed

Q.61 During inspiration the space inside the chest cavity is increased in:

A) Two ways C) Four ways

B) Three ways D) Five ways

Q.62 During inspiration; the muscles of the ribs contract and this:

A) Elevates the ribs upwards and outwards

B) Settles down the ribs downwards and backwards

C) Elevates the ribs upwards and backwards

D) Settles down the ribs downwards and forwards

Q.63 During inspiration, the muscles of the diaphragm:

A) Relax and diaphragm becomes more dome like

B) Contract and diaphragm becomes less dome like

C) Relax and diaphragm becomes less dome like

D) Contract and diaphragm becomes more dome like

Q.64 The space in chest cavity is increased due to the movement of:

A) Diaphragm upwards

B) Ribs downwards

C) Ribs upwards

D) Diaphragm downwards and ribs upwards

Q.65 With the expansion of lungs vacuum is created inside the lungs in which the air rushes from outside due to higher atmospheric pressure, this is called:

A) Respiration C) Ventilation

B) Inspiration D) Breathing

Q.66 Pick up the event which is not fit among the rest of the three events:

A) Ribs move downwards and inwards

B) Diaphragm becomes less dome like

C) Muscles of the ribs are relaxed

D) The space in chest cavity becomes less

Q.67 The immediate cause of the contraction of lungs during expiration is:

A) Muscles of diaphragm relax

B) Reduction in the space of chest cavity

C) Diaphragm becoming more dome like

D) Ribs moves downwards and inwards

Q.68 The chest cavity is reduced from the floor by:

A) Contraction of the muscles of diaphragm

B) Contraction of the muscles of the ribs

C) Relaxation of the muscles of diaphragm

D) Relaxation of the muscles of the ribs

Q.69 In premature infants, respiratory distress syndrome is common, especially for infants with a gestation age:

A) Less than 7 months

B) Less than 8 months

C) More than 7 months

D) More than 8 months

Q.70 The deficiency which becomes ultimate cause of respiratory distress syndrome is that of:

A) Gestation age

B) Number of alveoli

C) Surfactant

D) Atmospheric pressure

Q.71 The most important protein present in many animals including man is:

A) Myoglobin C) Albumin

B) Hemoglobin D) Fibrin

Q.72 It serves as an intermediate compound for the transfer of oxygen from hemoglobin to aerobic metabolic process of the muscle cells:

A) Blood plasma C) Myoglobin

B) RBCs D) Hemoglobin

Q.73 Which one of the following is a contagious disease?

A) Tuberculosis C) Emphysema

B) Asthma D) Obesity

Q.74 The chances of lung cancer are _____ times less in those persons who do not smoke:

A) 30 C) 10

B) 20 D) 5

Q.75 Alveolar walls degenerate and small alveoli combine to form larger alveoli in patients with:

A) Lung cancer C) Tuberculosis

B) Asthma D) Emphysema

ANSWER KEY (Worksheet-14 (i))					
1	D	26	A	51	C
2	D	27	A	52	A
3	B	28	C	53	C
4	B	29	C	54	A
5	A	30	C	55	A
6	B	31	C	56	D
7	A	32	C	57	B
8	A	33	C	58	C
9	C	34	C	59	D
10	C	35	D	60	A
11	C	36	B	61	A
12	A	37	C	62	A
13	A	38	D	63	B
14	D	39	C	64	D
15	D	40	A	65	B
16	A	41	C	66	B
17	B	42	C	67	B
18	D	43	A	68	C
19	C	44	A	69	A
20	B	45	C	70	C
21	C	46	B	71	B
22	D	47	A	72	C
23	D	48	B	73	A
24	B	49	D	74	C
25	B	50	C	75	D

EXPLANATION

Q.1 Answer is "Air sacs and Alveoli"

Explanation: Air passageways start from nostrils and end up at alveolar ducts. Alveoli are the sites of exchange of gases which are located inside the air sacs.

Q.2 Answer is "Six passageways"

Explanation: Because each nasal cavity is subdivided into three passageways by the projection of two bones form the walls of the internal nose. These bones are inferior nasal concha and middle nasal concha.

Q.3 Answer is "Internal nose"

Explanation: Each nasal cavity is subdivided into three passageways by the projection of bones from the walls on internal nose.

Q.4 Answer is "Two internal openings"

Explanation: These are internal nostrils or internal nares.

Q.5 Answer is "Upper end of trachea"

Explanation: The larynx or voice box is a complex cartilaginous structure surrounding the upper end of trachea.

Q.6 Answer is "Epiglottis"

Explanation: It is lid of glottis.

Q.7 Answer is "Larynx"

Explanation: The opening of larynx is called glottis and epiglottis is its lid.

Q.8 Answer is "Vocal cords"

Explanation: In the glottis the mucous membrane is stretched across into two thin edged fibrous bands called vocal cords, which help in voice production, when vibrated by air.

Q.9 Answer is "Not quite true"

Explanation: Glottis is never closed completely, so it is not quite true. However, glottis is partially closed by epiglottis during swallowing, thus it is baseless or quite wrong concept.

Q.10 Answer is "Backward movement of the tongue and upward movement of the larynx"

Explanation: By both of these movements glottis is partly closed and food is directed towards food pipe.

Q.11 Answer is "Backward movement of tongue"

Explanation: The closure of glottis is never complete; the degree of closure is determined partly by the backward movement of the tongue during

swallowing which forces the epiglottis into more or less horizontal position.

Q.12 Answer is "Epiglottis diverts the food mass to one side of the opening"

Explanation: Food does not enter the partly open larynx and obstruct breathing primarily because the epiglottis diverts the food mass to one side of the opening safely down the esophagus.

Q.13 Answer is "Right and left bronchi"

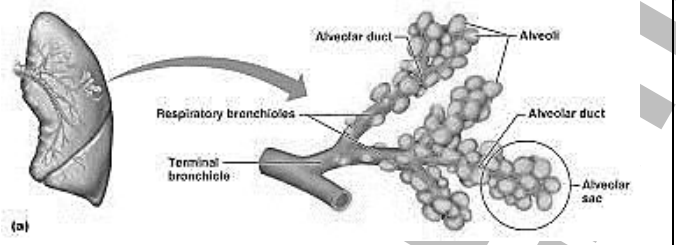
Explanation: Trachea sub-divides into light right and left bronchi. Each bronchus enters into a kidney.

Q.14 Answer is "Bronchioles"

Explanation: Trachea or wind pipe is a tubular structure lying ventral to the oesophagus and extends to the chest cavity or thorax where it is divided into right and left bronchi.

Q.15 Answer is "Bronchioles"

Explanation: Air sacs are functional units of lungs and receive air from bronchioles.



Q.16 Answer is "Pleural cavity"

Explanation: Pleural cavity provides protection to the lungs from over extension and also contains the pleural fluid.

Q.17 Answer is "Alveoli"

Explanation: Alveoli are structural units of lungs having thin membrane through which gases are exchanged with blood.

Q.18 Answer is "The lungs"

Explanation: Lungs are located in chest cavity also called as thoracic cavity.

Q.19 Answer is "Ribs and Muscles"

Explanation: Ribs provide bony protection to lungs against external physical trauma, whereas muscles are used in breathing.

Q.20 Answer is "Collapsing"

Explanation: Otherwise the walls will not be stronger enough to keep the lumen open.

Q.21 Answer is "Pleura"

Explanation: The pulmonary pleurae are the two pleurae of the invaginated sac surrounding lungs and attaching to the thoracic cavity.

Q.22 Answer is "Cell organs and tissue levels"

Explanation: Energy is basic need for any activity taking place at any level in an organism.

Q.23 Answer is "Cellular respiration"

Explanation: Cellular respiration is the process that utilizes oxygen, produces carbon dioxide and produces energy.

Q.24 Answer is "Hemoglobin"

Explanation: Main respiratory pigment in human body is hemoglobin, however in muscle cells myoglobin acts as a secondary respiratory pigment.

Q.25 Answer is "Hemoglobin"

Explanation: About 95% of the cytoplasm of red blood cells is occupied by hemoglobin and nucleus is also sacrificed to accommodate it.

Q.26 Answer is "Low oxygen concentration and less pressure"

Explanation: Oxyhaemoglobin is unstable and splits into the normal purple-red colored hemoglobin and oxygen in the condition of low oxygen concentration and less pressure. Carbonic anhydrase

enzyme present in R.B.C facilitates this activity

Q.27 Answer is "Splitting up of oxyhemoglobin"

Explanation: Carbonic anhydrase catalyses both formation and splitting up of oxyhemoglobin.

Q.28 Answer is "20 ml / 100 ml of blood"

Explanation: It is maximum oxygen carrying capacity of blood.

Q.29 Answer is "Not completely oxygenated"

Explanation: Because complete oxygenation requires optimum conditions and normal optimum conditions do not prevail.

Q.30 Answer is "19.6ml / 100 ml of blood"

Explanation: When oxygen tension is 115mm mercury, hemoglobin is 98 percent saturated and therefore, contains 19.6 ml of oxygen per 100ml of blood.

Q.31 Answer is "Decreases very sharply"

Explanation: Oxygen saturation level can be achieved under high pressure of O_2 only. When oxygen pressure falls, oxygenation level also falls.

Q.32 Answer is "Greater than that at sea level"

Explanation: Otherwise inhalation will not occur as air always moves from higher pressure to lower one.

Q.33 Answer is "Decreasing pH of the blood"

Explanation: As pH is decreased by increase in H^+ ion concentration and H^+ have antagonistic relation with O_2 for hemoglobin.

Q.34 Answer is "Increasing pH of the blood"

Explanation: By increasing pH concentration of hydroxyl (OH^-) ions is increased and concentration of (H^+) ions is decreased. As H^+ ions antagonize with O_2 for combining with hemoglobin, the low concentration of H^+ ions will favour the oxygen to combine with hemoglobin.

Q.35 Answer is "Increasing CO_2 pressure"

Explanation: CO_2 and O_2 also have antagonistic relation with hemoglobin.

Q.36 Answer is "Greater liberation of oxygen form the blood to the tissues."

Explanation: As O_2 and CO_2 both have bonding affinity with hemoglobin, so both compete with each other for it and if one is low in concentration the other will face lesser opposition in binding with hemoglobin and vice versa.

Q.37 Answer is "Combination of hydrogen ions with protein of hemoglobin"

Explanation: When pH is decreased, by increase in hydrogen ion concentration, the hydrogen ions get a chance to combine with the protein part of hemoglobin instead of oxygen and ability of oxygen to combine with hemoglobin decreases. Thus ultimate cause is combination of hydrogen ions with protein part of hemoglobin.

Q.38 Answer is "Normal conditions"

Explanation: Because the chemoreceptors of the body are more sensitive to CO_2 as compared to oxygen. That is why CO_2 acquires regulatory role.

Q.39 Answer is "20%"

Explanation: Some carbon dioxide (about 20%) is carried as carboxyhemoglobin. Carboxyhemoglobin is formed when carbon dioxide combines with amino group of hemoglobin

Q.40 Answer is "5%"

Explanation: Other plasma proteins also carry about 5% carbon dioxide from the body fluids to the capillaries of the lungs.

Q.41 Answer is "Bicarbonate ion"

Explanation: About 70% carbon dioxide is carried as bicarbonate ions combined with sodium in the plasma.

Q.42 Answer is "Sodium"

Explanation: About 70% carbon dioxide is carried as bicarbonate ions combined with sodium in the plasma.

Q.43 Answer is " $Hbo \rightarrow Hbo + O_2$ **"**

Explanation:

$CO_2 + H_2O \xrightarrow{\text{Carbonic anhydrase}} H_2CO_3$.

Q.44 Answer is " $HCO^- + H^+ \rightarrow H_2CO_3$ **"**

Explanation: As CO_2 is being moved and carried towards heart and finally to the lungs.

Q.45 Answer is " $H_2CO_3 \rightarrow CO_2 + H_2O$ **"**

Explanation: As CO_2 is required to be released from blood for exhalation.

Q.46 Answer is "Carbon dioxide"

Explanation: As CO_2 is going to be exhaled or removed from the body and lungs, through are passageways.

Q.47 Answer is "Oxygen"

Explanation: Because it is required to be carried to the tissues and cells of the body.

Q.48 Answer is "Potassium"

Explanation: Small amount of carbon dioxide is also carried by corpuscles combined with potassium.

Q.49 Answer is "4ml"

Explanation: As 50 ml of CO_2 per 100 ml of blood is residual volume of arterial blood. However, it becomes 54 ml of CO_2 per 100 ml of blood in vencus blood.

Q.50 Answer is "Breathing"

Explanation: It is also called as organismic respiration, external respiration and ventilation.

Q.51 Answer is "Breathing"

Explanation: Mechanical movement of ribs diaphragm and associated muscles is carried out in it breathing and it consists of two phases i.e. inhalation and exhalation.

Q.52 Answer is "Two phases"

Explanation: Inspiration and expiration.

Q.53 Answer is "Inspiration"

Explanation: Inspiration or inhalation means bringing fresh air into lungs.

Q.54 Answer is "Expiration"

Explanation: Expiration or exhalation means bringing CO_2 rich air from the lungs to the outside.

Q.55 Answer is "Three aspects"

Explanation:

(i) Passive role of lungs

(ii) Role of diaphragm

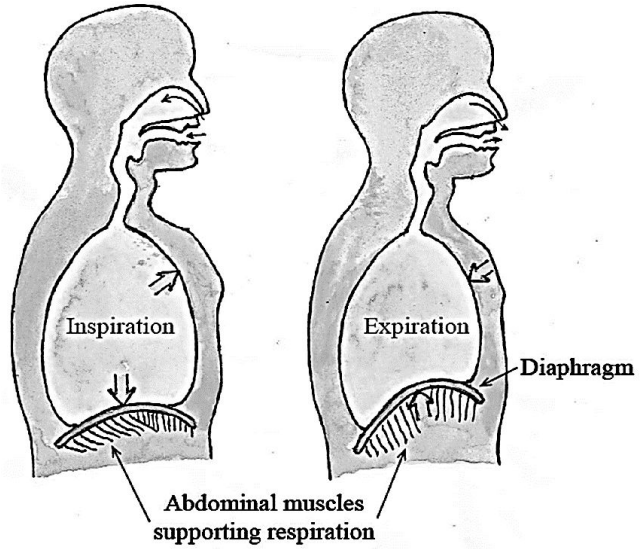
(iii) Role of chest wall and ribs

Q.56 Answer is "During expiration passive contraction takes place"

Explanation: As chest wall moves inward and downwards and diaphragm moves upwards the space around lungs is squeezed, they contact passively. During expiation these movements are reversed.

Q.57 Answer is "When its muscles are relaxed"

Explanation: Because by contraction it is flattened i.e. becomes less dome like.



Q.58 Answer is "When its muscles contract"

Explanation: By contraction of the muscles of diaphragm it is flattened and becomes less dome like.

Q.59 Answer is "Ribs and inter costal muscles"

Explanation: The walls of chest cavity consist of ribs and intercostal muscles

Q.60 Answer is "Muscles between the ribs contract"

Explanation: Ribs are lifted upwards and outwards by contraction of inter costal muscles and vice versa.

Q.61 Answer is "Two ways"

Explanation: When chest wall move outwards and diaphragm moves downwards, the space on lateral sides and lower side of lungs is increased.

Q.62 Answer is "Elevate the ribs upwards and outwards"

Explanation: When muscles of diaphragm contract it is flattened and becomes less dome like, creating space beneath the lungs.

Q.63 Answer is "Contract and diaphragm becomes less dome like"

Explanation: When muscles of diaphragm contract it is flattened and becomes less dome like, creating space beneath the lungs.

Q.64 Answer is "Diaphragm downwards and ribs upwards"

Explanation: During inspiration, to create space around the lungs rib cage is lifted upward and outwards whereas diaphragm moves downwards.

Q.65 Answer is "Inspiration"

Explanation: Inspiration means bringing free oxygen into lungs.

Q.66 Answer is "Diaphragm" becomes less dome like"

Explanation: Rest of the three events are associated with expiration whereas B choice is associated with inspiration, so it is odd among the rest of the three choices.

Q.67 Answer is "Reduction is space of chest cavity"

Explanation: Lungs contract when pressure outside the lungs increases due to decreased space and they are forced to squeeze.

Q.68 Answer is "Relaxation of the muscles of diaphragm"

Explanation: As muscles of the diaphragm relax, the sheet of diaphragm moves back to its normal place and becomes more dome like, reducing space below the lungs.

Q.69 Answer is "Less than 7 months"

Explanation: Because lungs attain maturity after 7 months of gestation period.

Q.70 Answer is "Surfactant"

Explanation: A substance which strengthens the alveolar membrane against surface tension.

Q.71 Answer is "Hemoglobin"

Explanation: Hemoglobin being respiratory protein (carrier protein) is the most important protein in many animals including man.

Q.72 Answer is "Myoglobin"

Explanation: Myoglobin is a hemoglobin like iron-containing protein pigment occurring is muscle fibers. Myoglobin is also known as muscle hemoglobin. It serves as intermediate compound for the transfer of oxygen from hemoglobin to aerobic metabolic processes of muscle cells.

Q.73 Answer is "Tuberculosis"

Explanation: Tuberculosis spreads through physical contact and air i.e. it is contagious.

Q.74 Answer is "10"

Explanation: As chances of lungs cancer are 10 time more in smokers, thus these 10 times less in non-smokers.

Q.75 Answer is "Emphysema"

Explanation: Due to persistent and constant coughing weakened alveoli burst and fuse together.

Worksheet-14 (ii)
(Transport in Plants)

Q.1 **Which one of the following is xerophyte?**
A) Hydrilla C) *Cactus*
B) Rose D) Corn

Q.2 **Most of the minerals enter the root hairs of roots along with water in the form:**
A) Active transport
B) Diffusion
C) Bulk flow
D) Facilitated diffusion

Q.3 **Which one of the following is always -ve?**
A) Water potential
B) Solute potential
C) Pressure potential
D) Water and pressure potential

Q.4 **Pulling upward of water and dissolved minerals towards the leaves through the xylem tissue is called:**
A) Transpiration pull C) Root pressure
B) Ascent of sap D) All of these

Q.5 **Translocation of food in phloem is due to:**
A) Transpiration pull C) Ascent of sap
B) Pressure of flow D) Cohesion

Q.6 **Most important pathway for transport of water and solutes in root is _____ pathway:**
A) Vacuolar C) Symplast
B) Apoplast D) Stomatal

Q.7 **At very high temperature, mesophyll cells secrete _____, which closes stomata:**
A) Auxins C) Gibberellins
B) Cytokinins D) Abscisic acid

Q.8 **The guard cells are the only photosynthesizing cells of _____ of leaf:**
A) Mesophyll C) Endodermis
B) Epidermis D) Hypodermis

Q.9 **It constitutes the inner bark:**
A) Xylem C) Endodermis
B) Phloem D) Epidermis

Q.10 **The active transport of K^+ ions into the guard cell is stimulated by:**
A) High level of H_2
B) Low level of CO
C) Low level of O_2
D) Low level of CO_2

Q.11 **It directly controlled by the opening and closing of stomata:**
A) Gravity C) Light
B) Temperature D) Oxygen

Q.12 **Transpiration increases with increase in the:**
A) Availability of light to the plant
B) Dryness of the atmosphere
C) Velocity of wind
D) Availability of soil water

Q.13 **Rate of transpiration doubles by every rise of 10 ^oC in temperature:**
A) Respiration C) Perspiration
B) Photosynthesis D) Transpiration

Q.14 **It is not directly related to the rate of transpiration:**
A) Temperature
B) Light
C) Cellular respiration
D) Wind

Q.15 **The evaporation of water through surface of plant is called:**
A) Evaporation C) Transpiration
B) Condensation D) Pressure flow

Q.16 **Transpiration decreases when guard cells of stomata become?**
A) Flaccid C) Collapsed
B) Turgid D) Ruptured

Q.17 **Companion cells are important in phloem tissue because they supply _____ to sieve elements:**
A) Water C) Carbohydrates
B) ATPs D) Proteins

Q.18 **The main force that draws water from the soil for plant is caused by a process called:**
A) Evaporation
B) Transpiration pull
C) Guttation
D) Wilting

Q.19 The shrinkage of protoplast due to exosmosis is:
A) Ascent of sap C) Plasmolysis
B) Guttation D) Deplasmolysis

Q.20 A plant requires nitrogen and sulphur for its:
A) Cell wall
B) Starch deposit
C) Enzyme
D) DNA replication

Q.21 A rye plant less than _____ tall has branch roots about:
A) Two-meter C) One meter
B) Five meter D) Half meter

Q.22 Which of the following process cause substances to move across membranes without expenditure of cellular energy?
A) Endocytosis C) Active transport
B) Diffusion D) None

Q.23 The casparian strips are present in:
A) Cortex cells of root
B) Pericycle
C) Endodermis cells of roots
D) Xylem

Q.24 Most of mycorrhizae are present in:
A) 50% of vascular plants
B) 70% 0f angiosperms
C) 70% of gymnosperms
D) 90% of angiosperms

Q.25 Force exerted by protoplast against cell wall is called _____ potential:
A) Osmotic C) Pressure
B) Solute D) Generator

Q.26 Hydathodes are associated with:
A) Transpiration C) Guttation
B) Conduction D) Deplasmolysis

Q.27 The force of attraction between water molecules is:
A) Adhesion C) Tensile
B) Cohesion D) Imbibition

Q.28 The xylem water tension is strong enough to pull water to _____:
A) 200 meters C) 300 meters
B) 400 feets D) 500 feets

Q.29 Which of the following is soluble in water?
A) Cellulose C) Pectin
B) Lignin D) Glucose

Q.30 The volume of dry seed increased by imbibitions is _____ times:
A) 100 C) 300
B) 200 D) 150

Q.31 1% of the absorbed water is used by plants in its activities during:
A) Metabolism C) Photosynthesis
B) Respiration D) Vernalisation

Q.32 In tall trees large quantities of water is carried at speed of:
A) $2mh^{-1}$ C) $8mh^{-1}$
B) $3mh^{-1}$ D) $10mh^{-1}$

Q.33 Total transpiration which can take place through stomata is
A) 60-70 C) 80-90%
B) 1-2% D) 5-7%

Q.34 Pick up the types of transpiration which does not occur in all plants:
A) Cuticular transpiration
B) Stomatal transpiration
C) Lenticular transpiration
D) Stem transpiration

Q.35 During the exposure of blue light all of the following events occurs, EXCEPT:
A) Acidification of environment
B) Turgidity of guard cells
C) Uptake of K ions of guard cells
D) Flaccidity of guard cells

Q.36 Which one of the following is involved in the closing of stomata?
A) Gibberellins C) Abscisis acid
B) Ethane D) Cytokinine

Q.37 When leaves transpire the water potential of mesophyll cells is:
A) Increased
B) Does not change
C) Decreased
D) First increased and decreased

Q.38 When guard cells become turgid, transpiration?
A) Increases C) Decreases
B) No effect D) Stops

Q.39 Phloem is generally found on outer side of:
A) Xylem C) Epidermis
B) Endodermis D) Pericycle

Q.40 Root of beet acts as:
A) Source
B) Sink
C) Producer
D) Source and sink both

Q.41 Average velocity of movement of sugars in phloem is:
A) 1 meter/8 years C) 1 meter/hour
B) 1 meter/day D) 20cm/min

Q.42 While moving towards the sieve elements sucrose takes the _____mostly?
A) Apoplast pathway
B) Vacuolar pathway
C) Symplast pathway
D) Apoplast pathway

Q.43 Cytoplasmic strands that extend through pores in adjacent cell walls are known as:
A) Pseudopods C) Symplasts
B) Plasmodesmata D) Pili

Q.44 The movement of water molecules from a region of higher water potential to a region of lower water potential (through membrane):
A) Diffusion
B) Active transport
C) Osmosis
D) Facilitated diffusion

Q.45 Cuticular transpiration is _____ of total transpiration:
A) 6-8% C) 5-7%
B) 7-9% D) 4-6%

Q.46 Lenticular transpiration is _____ of total transpiration:
A) 2-3% C) 1-3%
B) 1-4% D) 1-2%

Q.47 _____ have the adaptations for reduced rate of transpiration:
A) Hydrophytes C) Mesophytes
B) Xerophytes D) Halophytes

Q.48 Many _____ posses small, thick leaves to limit water loss by reducing surface area proportional to the volume:
A) Hydrophytes C) Mesophytes
B) Xerophytes D) Halophytes

Q.49 They have thick, waxy and leathery cuticle:
A) Hydrophytes C) Xerophytes
B) Mesophytes D) Sciophytes

Q.50 Stomata are on lower surface of leaves and located in depression in:
A) Hydrophytes C) Sciophytes
B) Mesophytes D) Xerophytes

ANSWER KEY (Worksheet-14(ii))					
1	C	21	C	41	C
2	C	22	B	42	C
3	B	23	C	43	B
4	B	24	D	44	C
5	B	25	C	45	C
6	B	26	C	46	D
7	D	27	B	47	B
8	B	28	A	48	B
9	B	29	D	49	C
10	D	30	B	50	D
11	C	31	C		
12	B	32	C		
13	D	33	C		
14	C	34	C		
15	C	35	D		
16	A	36	C		
17	B	37	C		
18	B	38	A		
19	C	39	A		
20	C	40	D		

EXPLANATION

Q.1 **Answer is "*Cactus*"**
Explanation: *Cactus* is xerophytic plant.

Q.2 **Answer is "Bulk flow"**
Explanation: Most of the minerals enter the root hairs of roots along with water in the form bulk flow.

Q.3 **Answer is "Solute potential"**
Explanation: Solute potential is always -ve.

Q.4 **Answer is "Ascent of sap"**
Explanation: Pulling upward of water and dissolved minerals towards the leaves through the xylem tissue is called ascent of sap.

Q.5 **Answer is "Pressure of flow"**
Explanation: The theory called, Pressure – Flow Theory, is the most acceptable theory for the transport in the phloem of angiosperms. We have considerable evidence to support this theory. There were two main categories of theories to account for movement of sap in phloem.

Q.6 **Answer is "Apoplast"**
Explanation: The apoplast pathway is of greatest importance for both water and solutes. The symplast pathway is less important, except for salts in the region of the endodermis. Movement along the vacuolar pathway is negligible.

Q.7 **Answer is "Abscisic acid"**
Explanation: Hormones are involved in stomatal movement in plants. At high temperature when leaf cells start wilting a hormone is released by mesophyll cells. This hormone is called abscisic acid. This hormone stops the active transport of K^+ into guard cells, overriding the effect of light and CO_2 concentration. So K^+ pumping stops. Stomata close.

Q.8 **Answer is "Epidermis"**
Explanation: The German botanist H. Van Mohl proposed that the guard cells are the only photosynthesizing cells of epidermis of leaf and sugars are produced in them during day time when light is available.

Q.9 **Answer is "Phloem"**
Explanation: The phloem is generally found on the outer side of both primary and secondary vascular tissue in plants with secondary growth. The phloem constitute the inner bark. The cells of phloem that conduct or transport sugars and other organic material throughout the plant are called sieve elements.

Q.10 **Answer is "Low level of CO_2"**
Explanation: What controls the movement of K^+ into and out of guard cells? Level of carbon dioxide in the spaces inside the leaf and light, control this movement. A low level of carbon dioxide favours opening of the stomata, thus allowing an increased carbon dioxide level and increased rate of photosynthesis.

Q.11 Answer is "Light"
Explanation: The opening and closing of stomata is directly controlled by the light,. In strong light the rate of transpiration is much more as compared with that in dim light or no light. As potassium actively enters the guard cells when light is available, water follows – and guard cells become turgid, and stoma opens.

Q.12 Answer is "Dryness of the atmosphere"
Explanation: When air is dry, the rate of diffusion of water molecules, from the surfaces of mesophyll cells, air spaces, and through stomata to outside the leaf, increases. So more water is lost, increasing the rate of transpiration. In humid air the diffusion rate is reduced. This decreases the rate of transpiration appreciably.

Q.13 Answer is "Transpiration"
Explanation: The rate of transpiration doubles by every rise of 10^0 C in temperature. Very high environmental temperature. i.e. 40-45^0 C cause closure of stomata, so that plant does not loose much needed water.

Q.14 Answer is "Cellular respiration"
Explanation: Cellular respiration is not directly related to the rate of transpiration. There are some important factors which affect the rate of transpiration in a plant.
i. Light ii. Temperature
iii. CO_2 concentration
iv. Humidity and vapour pressure
v. Wind
vi. Availability of soil water

Q.15 Answer is "Transpiration"
Explanation: The evaporation of water through surface of plant is called transportation.

Q.16 Answer is "Flaccid"
Explanation: When guard cells become turgid the stoma or pore opens. When flaccid stoma or pore between them closes.

Q.17 Answer is "ATPs"
Explanation: Companion cells supply ATP and proteins to sieve tubes. The photosynthetic products from photosynthesizing cells, the mesophyll and palisade layer of leaf, pass into sieve tubes, through the companion cell via plasmodesmata.

Q.18 Answer is "Transpiration pull"
Explanation: The main force that draws water from the soil for plant is caused by a process called Transpiration pull.

Q.19 Answer is "Plasmolysis"
Explanation: Plasmolysis can be defined as the shrinkage of protoplast due to exosmosis of water. When a living cell is placed in a solution having lower water potential than that of the cell, plasmolysis takes place and the cell is called plasmolysed.

Q.20 Answer is "Enzyme"
Explanation: A plant requires nitrogen and sulphur for its enzyme.

Q.21 Answer is "One meter"
Explanation: A rye plant less than one meter tall has some 14 million branch roots of a combined length of over 600 kilometers.

Q.22 Answer is "Diffusion"
Explanation: Diffusion cause substances to move across membranes without expenditure of cellular energy.

Q.23 Answer is "Endodermis cells of roots"
Explanation: The casparian strip separates the extracellular space in the root into two compartments: an outer compartment that is continuous with the soil water, and an inner compartment that is continuous with the inside of the conducting cells of the xylem.

Q.24 Answer is "90% of angiosperms"
Explanation: Mycorrhizal fungi get sugar, and shelter from the plant and in exchange increase the plant's mineral nutrient uptake efficiency. Mycorrhizae are present in 90% families of flowering plants.

Q.25 Answer is "Pressure"
Explanation: Force exerted by protoplast against cell wall is called pressure potential.

Q.26 Answer is "Guttation"
Explanation: Closely associated with root pressure is a phenomenon called guttation or exudation. Guttation is loss of liquid water through water secreting glands or hydathodes. The dew drops that can be seen on the tips of grass leaves or strawberry leaves are actually guttation droplets exuded from hydathodes.

Q.27 Answer is "Cohesion"
Explanation: The force of attraction between water molecules is cohesion. It is the attraction among water molecules which hold water together, forming a solid chain-like column within the xylem tubes. The water molecules form hydrogen bonds between them.

Q.28 Answer is "200 meters"
Explanation: It is provided when this water chain is pulled up in the xylem. Transpiration provides the necessary energy or force. Tension is between the molecules of water by hydrogen bonds. This xylem water tension is strong enough to pull water up to 200 meters (more than 600 feet) in plants.

Q.29 Answer is "Glucose"
Explanation: Glucose is soluble in water because it is a monosaccharide in nature.

Q.30 Answer is "200"
Explanation: The volume of dry seed increase up to 200 times by imbibition, as a result, the seed coat ruptures and makes the germination of seed effective.

Q.31 Answer is "Photosynthesis"
Explanation: 1% of the absorbed water is used by plants in its activities during photosynthesis.

Q.32 Answer is "$8mh^{-1}$"
Explanation: Large quantities of water are carried at relatively high speed, upto $8mh^{-1}$ being recorded in tall trees, and commonly in other plants at $1mh^{-1}$.

Q.33 Answer is "80-90%"
Explanation: The degree of opening of stomatal pores also affects the rate of transpiration. 905 of total transpiration in a plant is stomatal.

Q.34 Answer is "Lenticular transpiration"
Explanation: Lenticular transpiration is the loss of water vapours through lenticels present in the stem of some plants. All plants do not possess lenticels.

Q.35 Answer is "Flaccidity of guard cells"
Explanation: Exposure to blue light, which is also effective in photosynthesis has been shown to acidify the environment of the guard cells (i.e. pumps out protons) which enable the guard cells to take up K^+ followed by water uptake resulting in increased turgidly of guard cells. So in general stoma are open during day and closed at night. This prevents needless loss of water by the plant when it is too dark for photosynthesis.

Q.36 Answer is "Abscisis acid"
Explanation: Hormones are involved in stomatal movement in plants. At high temperature when leaf cells start wilting a hormone is released by mesophyll cells. This hormone is called abscisic acid. This hormone stops the active transport of K^+ into guard cells, overriding the effect of light and CO_2 concentration. So K^+ pumping stops. Stomata close.

Q.37 Answer is "Decreased"
Explanation: When leaves transpire the water potential of mesophyll cells is decreased. As a leaf transpires the water potential of its mesophyll cells drops.

Q.38 Answer is "Increases"
Explanation: When sugar level rises i.e. solute concentration increases of water potential decreases- and the guard cells become turgid due to entry of water and they separate from one another, and stoma or pore opens.

Q.39 Answer is "Xylem"
Explanation: Phloem is generally found on outer side of xylem.

Q.40 Answer is "Source and sink both"
Explanation: Root of beet acts as source and sink both.

Q.41 Answer is "1 meter/hour"
Explanation: Average velocity of movement of sugars in phloem is 1 meter/hour.

Q.42 Answer is "Symplast pathway"
Explanation: While moving towards the sieve elements sucrose takes the symplast pathway mostly.

Q.43 Answer is "Plasmodesmata"
Explanation: Cytoplasmic strands that extend through pores in adjacent cell walls are known as plasmodesmata.

Q.44 Answer is "Osmosis"
Explanation: The movement of water molecules from a region of higher water potential to a region of lower water potential through membrane osmosis.

Q.45 Answer is "5-7%"
Explanation: The loss of water in the form of water vapours through the cuticle of leaves is called circular transpiration. About 5-7% of total transpiration takes place through this route.

Q.46 Answer is "1-2%"
Explanation: The lenticular transpiration is 1-2% of the total transpiration by a plant.

Q.47 Answer is "Xerophytes"
Explanation: Many xerophytes posses small, thick leaves to limit water loss by reducing surface area proportional to the volume. Their cuticle is thick, waxy and leathery.

Q.48 Answer is "Xerophytes"
Explanation: Many xerophytes posses small, thick leaves to limit water loss by reducing surface area proportional to the volume.

Q.49 Answer is "Xerophytes"
Explanation: Their cuticle is thick, waxy and leathery.

Q.50 Answer is "Xerophytes"
Explanation: Stomata are on lower surface of leaves and located in depression.

STEP

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