

Biology

Date: _____

Chap#3

Respiratory System of man

Exercise

(1)

What is respiratory surface?
Write the properties of respiratory surface.

Resp. Surface:

The area where gaseous exchange with environment actually takes place is called the respiratory surface.

Properties:

- ⇒ It must be moist and permeable.
- ⇒ It must be thin b/c diffusion is only efficient over distance of 1mm or less.
- ⇒ It should possess a large surface area.
- ⇒ It should possess a good blood supply.
- ⇒ There should be a good ventilation mechanism.

(2)

What organs constitute the respiratory surface?

Respiratory System consists of two regions.

- 1- Upper Respiratory Tract ⇒ (a) Nose (b) pharynx
- 2- Lower Respiratory Tract ⇒ (a) Trachea (b) Bronchi
(c) Lungs

(3)

How nose and nasal cavity function in filtering the incoming air?

Nostrils and nasal cavity are lined by ciliated mucous membranes. Nose hairs, mucus and cilia serve as defense mechanism against harmful pathogens and particulate matter present in the air. The mucus and cilia filter the incoming air.

(4)

What is the role of "pharynx" in human respiration.

Pharynx is cone-shaped common passageway leading from oral and nasal cavity to esophagus and larynx. The pharynx is conventionally divided into three sections.

- ⇒ Nasopharynx
- ⇒ Oropharynx
- ⇒ Laryngopharynx

(5)

Describe function of human Larynx.

During swallowing, Larynx is raised and epiglottis is pressed downward. As a result, the epiglottis partially covers the opening of larynx and help to prevent food and liquid from entering in the air passage.

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(6)

Describe the structure and function of alveoli?

- ⇒ The alveolar ducts end at tiny air filled chambers called alveoli.
- ⇒ Alveoli is the site of gas exchange b/w air and blood. There are 700 million alveoli present in the lungs.

(7)

How the contraction and relaxation of human lungs take place?

Diaphragm and intercostal muscles are involved in contraction and relaxation of the lungs.

During inspiration, contraction of diaphragm, contraction of external intercostal muscles and relaxation of internal intercostal muscles.

During expiration, relaxation of diaphragm, relaxation of external intercostal muscles, and contraction of internal intercostal muscles take place.

(8)

What is chloride shift?

From inside the erythrocytes negatively charged (HCO_3^-) ions diffuse to plasma.

This is balanced by the diffusion of chloride ions (Cl^-) in opposite direction.

This is called chloride shift or Hamburger phenomenon.

What are the advantages of having millions of alveoli rather than a pair of simple balloon like lungs?

There are 700 million of alveoli present in the lungs which serve as large surface area. Greater the surface area, greater the rate of gaseous exchange. vice-versa.

If lungs are present in form of simple balloon like structure so, respiratory surface area reduced.

(10)

Write the difference b/w

(a)

Int. Respiration

⇒ Breakdown of C-H bonds in food and release energy (ATP).

⇒ It is metabolic (catabolic) pathway.

⇒ process consists of

(a) Glycolysis

(b) Link Reaction

(c) Krebs cycle

(d) Electron Transport chain

Ext. Respiration

⇒ The air (O_2) take into the lungs and exhale air (CO_2).

⇒ It is mechanical process.

⇒ process consists of

(a) Inspiration

(b) Expiration

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(b)

Upper Resp. Tract

Upper Respiratory tract consists of nostrils, nasal cavity and pharynx.

Lower Resp. Tract

Lower respiratory tract consists of trachea, bronchi and lungs.

(c)

Bronchi

⇒ Trachea divided into two smaller tubes called bronchi

⇒ Bronchi divided into bronchioles.

⇒ C-shaped cartilage present.

Bronchioles

⇒ Bronchi divided into many smaller tubes called bronchioles.

⇒ Bronchioles forms alveolar ducts.

⇒ No cartilage present.

(d)

Oxyhaemoglobin

⇒ In RBCs, haemoglobin combines with oxygen to form oxyhaemoglobin.

⇒ $Hb + 4O_2 \xrightarrow{\text{carbonic anhydrase}} Hb4O_2$

Carboxyhaemoglobin

⇒ Haemoglobin combines with carbon dioxide to form carboxyhaemoglobin

(e)

Haemoglobin

⇒ It consists of 4 polypeptide chains.

⇒ 4 Oxygen molecules can bind.

⇒ It is found in RBCs.

⇒ It transports oxygen.

Myoglobin

⇒ It consists of one polypeptide chain.

⇒ Only one oxygen molecule can bind.

⇒ It is found in muscles.

⇒ It stores oxygen.

List the effects of smoking.

- ⇒ Cigarette smoking causes about 87% of lung cancer.
- ⇒ Smoking also cause mouth, larynx and esophagus cancer.
- ⇒ Smokers are likely to get pneumonia.