Class Work

Questions (to be solved)

Topic- Respiration

Date: 14h April 2020

Instruction:

- **Questions you need to copy in your c/w Biology copy and then write down the answers. Try sincerely, then if any problem contact me.**
- **'Notes' part you can write or you can take print out and paste in your copy but make sure everything must be in one copy.**
- **Q. 1 to 4 are MCQ type. Q. 5 is assertion reason based and Q. 6 to 10 are 2-3 marks questions.**

1. Glycolysis is a part of

a. Only anaerobic respiration
b. Kreb's cycle
c. Only aerobic respiration
d. Both aerobic and anaerobic respiration

2. Trachea divides in two smaller tubes named

a. Bronchi
b. Microtrachea
c. Bronchioles
d. Eustachian tube

3. Anatomically which lies in front of esophagus
   a. Trachea
   b. Glottis
   c. Epiglottis
   d. Larynx
4. CO_2 is carried in blood primarily with the help of

   a. Hemoglobin
   b. Serum
   c. Plasma
   d. RBC

Choose any one option

1. Both A and R are true and R is the correct explanation of A.

2. Both A and R are true but R is not the correct explanation of A.
3. A is true but R is false.
4. A is false but R is true.
5. Both A and R are false.

5. A: All carbohydrates are usually first converted into glucose before they are used for respiration.

R: Proteins, fats and organic acids can also be respired but they do not enter the respiratory pathway at the first step.

6. With a chart show all the three respiratory pathways in detail (aerobic and anaerobic).
7. Why diffusion alone is not sufficient to fulfil the gaseous exchange demand in human body?
8. Explain the role of alveoli in respiration.
9. Why our trachea can withstand enormous air pressure?
10. How does lung capacity increased in human?

NOTES

Respiration is a process in which glucose is broken down with the help of oxygen and energy is released along with the production of carbon dioxide and water.

There are two types of respiration i) aerobic respiration ii) anaerobic respiration.

Aerobic respiration- the process of respiration that takes place in the presence of oxygen.

Example- glucose(a 6-carbon molecule) breaks into pyruvate(a 3-carbon molecule) and in the mitochondria pyruvate is broken down into 3 molecules of carbon dioxide and water with the release of energy.

Glucose --> pyruvate + energy à carbon dioxide + water + energy.

Anaerobic respiration- the process of respiration that takes place in the absence of oxygen.

Example-

- In yeast cells, glucose (a 6-carbon molecule) breaks into pyruvate (a 3-carbon molecule) and pyruvate is then converted to ethanol(a 2-carbon molecule) and carbon dioxide.

Glucose --> pyruvate + energy --> ethanol + carbon dioxide + energy.

- If there is a lack of oxygen in our muscle cells, pyruvate breaks in a different pathway. Glucose (a 6-carbon molecule) breaks into pyruvate (a 3-carbon molecule) and pyruvate is then converted to lactic acid (a 3-carbon molecule) along with the release of energy.

Glucose -->pyruvate + energy --> lactic acid + energy.

The energy released during the process of respiration is immediately used to synthesize another molecule called as **ATP**.
ATP is made from ADP and inorganic phosphate with the help of energy released during respiration.

ATP is broken down into a fixed amount of energy and then drive the endothermic reactions in the cell.

<u>Respiration in plants</u>

- Plants exchange gases through stomata.
- The large inter-cellular spaces ensure that all the cells are in contact with air.
- Carbon dioxide and oxygen are exchanged in and out of the cells by the process of
- Diffusion is directed by environmental conditions and the requirements of the plants.
- During night, in the absence of sunlight photosynthesis do not take place and hence carbon dioxide is released but not used up by the plants.
- During the day, there is no carbon dioxide release because the released carbon dioxide is used up by the plants for photosynthesis.

- Oxygen is released instead of carbon dioxide during the day.

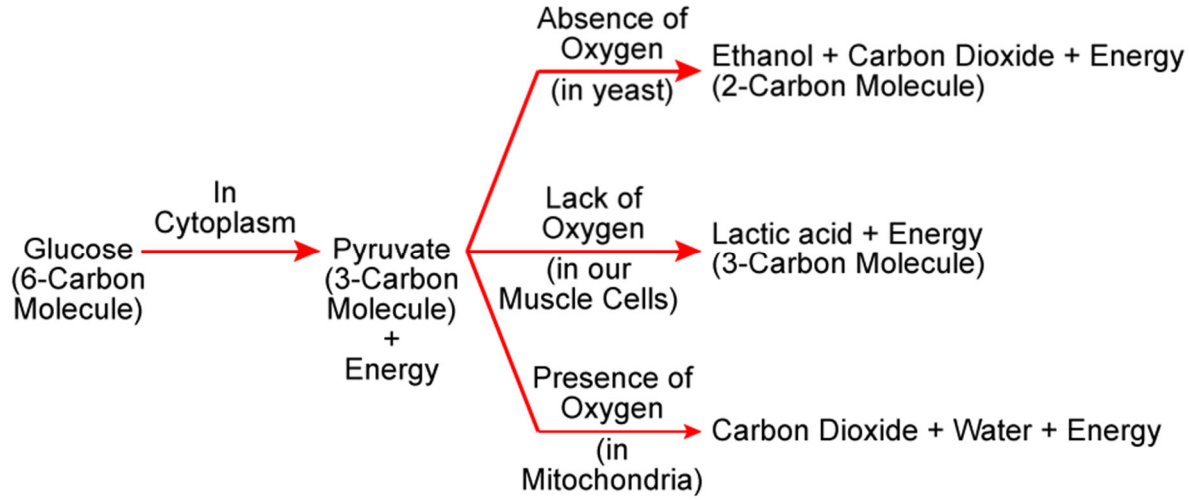
Respiration in animals

- In aquatic animals, rate of breathing is fast due to the less amountof dissolved oxygen in water
- Fishes take in water through their mouths and force it to the gills from where the dissolved oxygen is absorbed by blood.
- Terrestrial organisms use atmospheric oxygen and different animals use different organs for breathing.
- The surface of the organs is very fine and delicate and placed within the body.
- Passages are there in the body which takes the oxygen rich air to the area of respiration.

Respiration in human beings

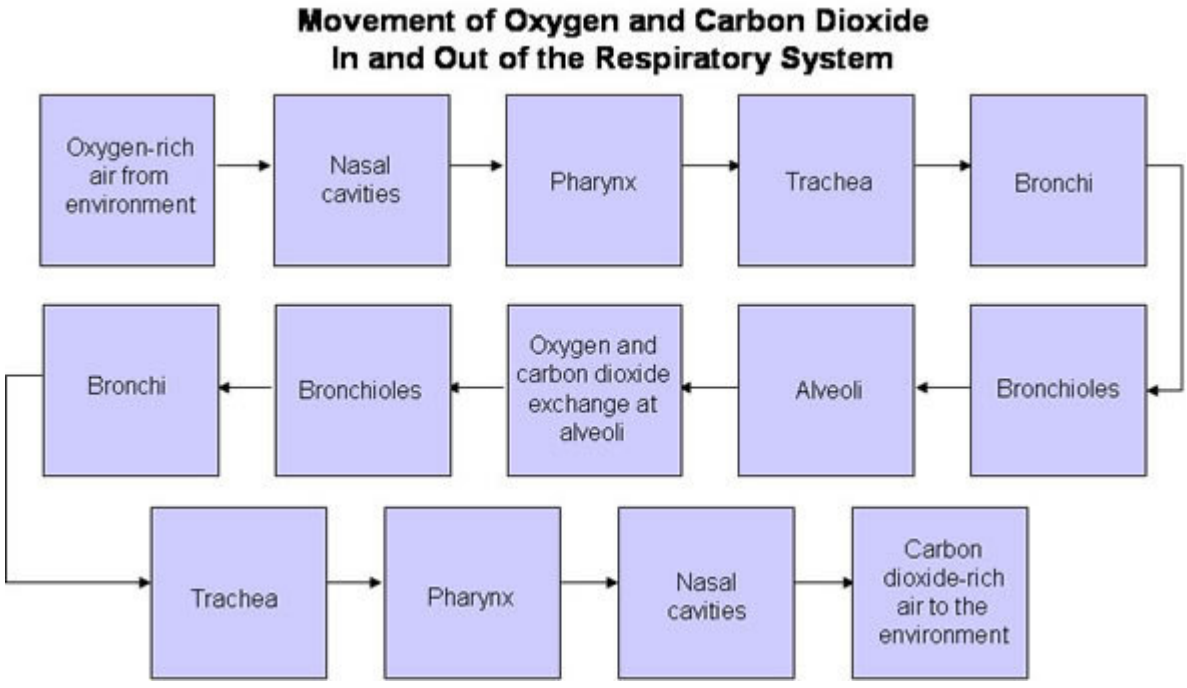
- Air is taken in through nostrils and the air is filtered while passing through the nostrils by fine hairs and mucus that line the passage.
- From nostrils air passes to throat where rings of cartilages are present to ensure that air passage does not collapse.
- Air reaches lungs from throats and within the lungs the passage divides into smaller and smaller tubes ending into balloon-like structure called **alveoli**.
- Network of blood vessels are present in the alveoli.
- During breathing air is sucked into the lungs and fills the expanded alveoli.
    - The oxygen in the alveolar air is taken by the blood vessels after releasing carbon dioxide collected from all the cells of the body in the alveoli.
    - Lungs contain a residual volume of air during the breathing cycle.
    - Respiratory pigments present in the body take up oxygen from lungs and transport to all the cells of the body.
    - Hemoglobin is the respiratory pigment of human beings present in the red blood cells which has high affinity for oxygen.
    - As carbon dioxide is more soluble in water than oxygen so it is transported mostly in the dissolved form in our blood.

Respiratory pathways:



RESPIRATION IN HUMANS

the respiratory system is composed of a network of passageways which permit air to flow from the external environment to the internal environment



Transport of gases:

1) In the blood, oxygen is carried by the red blood cells as **oxyhemoglobin** (this is just oxygen bonded to hemoglobin).

2) At the body cells, this oxygen leaves the hemoglobin by easily diffusing through the capillaries.

3) The cells can now carry out cellular aerobic respiration at the *mitochondria* for energy.

4) The end products (metabolic wastes) of cellular respiration, carbon dioxide and water) now diffuse back out of the cells into the blood.

5) Carbon dioxide is carried in the blood plasma in the form of bicarbonate ion (CO_3)

6) These molecules then diffuse out of the blood through the walls of the capillaries which surround the alveoli and then are exhaled.