TENTH

Biology

Q: "If there are no algae, there will be no fishes in the sea". How do you justify? *(1 Mark)*

A: Algae produce Oxygen as a result of photosynthesis. This oxygen is utilized by the fishes in the sea for respiration. If there is no oxygen fishes may die.

Q: What are the factors that control respiration? *(1 Mark)*

A: Oxygen and temperature.

Plants photosynthesize during...

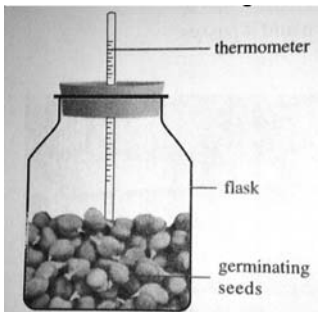
Respiration - The Energy Releasing System

4 Marks Questions

Q: What experiment would you conduct to prove that heat is liberated during respiration?

A: I would conduct the following experiment to prove that heat is liberated during respiration.

- **Aim:** To prove that heat is liberated during respiration.
- **Apparatus:** Germinating bazra seeds (sprouts), thermos flask, thermometer, rubber cork.



Procedure:

- Take some germinating bazra seeds (sprouts) into a thermos flask.
- Make hole to the rubber cork and insert thermometer. Arrange carefully that the bulbs of the thermometer should dip in the sprouts.
- Record the temperature for every 2 hours.
- Observe it throughout the day.

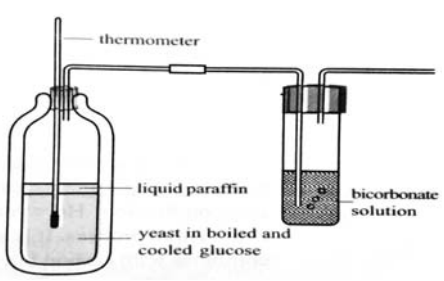
- **Observation:** Constant increase in the temperature is observed in the thermometer. Germinating seeds respire rapidly and release heat. So, constant increase in the temparature is observed.
- **Result:** Hence it is proved that heat is liberated during respiration.

Q: How do you appreciate the mechanism of respiration in our body?

A: ■ Respiratory system in man collects the air, filters and supplies oxygen to each and every cell through blood continuously. It is a wonderful phenomenon.

- This respiration takes place both external and internal at lungs and cells.
- Air ways produce mucus which keeps the air moist.
- This moisture restricts the dust particles which enter along with air.
- The cilia in the air ways trap the dust particles, germs and exculpate them out of the lungs through mucus.
- Air gets filtered when it reaches to branchi. It is a wonderful mechanism.

Q: The following experiment might be done in your school. Recollect once and answer the following questions.



i) What does the above diagram indicate?

ii) In the above experiment liquid paraffin is poured on the boiled and cooled glucose.

Q: What differences will you find between Areobic respiration and Anaerobic respiration?

A: Aerobic respiration	Anaerobic respiration
1. $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + 686$ K.Cal.	**1.** $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2 + 56$ K.Cal
2. Oxygen is required.	**2.** Oxygen is not required.
3. It takes place in the presence of Oxygen.	**3.** It takes place in the absence of oxygen.
4. End products are CO_2 and water.	**4.** End products are either ethyl alcohol or lactic acid and CO_2.
5. Lot of energy is produced.	**5.** Relatively less energy is produced.
6. Occurs in mitochondria.	**6.** No involvement of mitochondria .
7. Kreb's cycle & electron transport occur.	**7.** Kreb's cycle and electron transport do not occur.
8. In this 38 ATP molecules are formed.	**8.** In this 2 ATP molecules are formed.

Why?

iii) Why diazine green solution is added to glucose? What change do you observe after this?

iv) Why should the bulb of the thermometer be kept inside the solution?

A: i) Testing of production of heat and CO_2 under anaerobic respiration.

ii) To cut the supply of oxygen from the air liquid paraffin is poured.

iii) To test the removal of oxygen from the glucose and yeast mixture. If oxygen is in short supply this dye turns pink.

iv) The bulb of the thermometer should be kept inside the solution to observe the rise in temperature when anaerobic respiration occurs.

One Mark Questions

Q: What is respiration?

A: ■ Respiration is the process in which food is broken for release of energy. (or)
■ Oxidation of food for releasing energy.

Q: Imagine that what changes are done when the air passes through nasal cavities in inspiration?

A: Air is filtered in nasal cavities by mucous lining and the hairs growing from its sides remove tiny particles of dust. Air temperature is brought close to that of body.

Q: What is the main reason for feeling pain in muscles after strenuous exercises?

A: Due to anaerobic respiration in muscles, large amount of lactic acid is accumulated and this results in muscular pains.

Q: How is trachea prevented from collapsing?

A: The walls of trachea are supported by several "C" shaped cartilaginous rings. They prevent the trachea from collapsing and closing.

Q: How do you appreciate the lenticels?

A: Lenticels are the portion of the bark with numerous intercellular spaces. Their purpose is to allow gas exchange through the compactly arranged cork cells of the bark.

Q: What is cellular respiration?

A: Oxidation of glucose or fatty acids take place in the cells and energy is released. Hence this process is known as cellular respiration.

Q: What is the main difference between respiration and combustion?

A: In respiration several intermediate products are formed and in combustion there are no intermediate products are formed.

2 Marks Questions

Q: Imagine what happens if diaphragm is not there in the body?

A: ■ During inhalation the diaphragm contracts and flattens increasing the volume of chest cavity.
■ During exhalation it relaxes decreasing the volume of chest cavity.
■ If diaphragm is not there in the body, there will be no breathing movements.
■ So breathing stops.

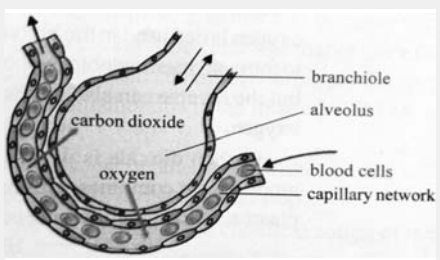
Q: Why does the rate of breathing increases while uphill at a normal pace in the mountains? Give reasons.

A: ■ While uphill more energy is required to compensate required energy, the rate of respiration increases.
■ At higher levels the percentage of oxygen decreases. So to get more oxygen we have to breath more number of times.
■ Due to consumption of more oxyzen by the body, more oxyzen is required for the cells in the body.
■ Hence, the rate of respiration increases.

Q: Food sometimes enters the wind pipe and causes choking. How does it happen?

A: The wind pipe is covered by the epiglottis . So it does not allow the food to go inside when a person swallows it.
■ If the food enters the trachea, it may block it completely and cause a person to choke to death.
■ If the food goes down the trachea, it can lodge in the wind pipe and cause suffocation.
■ Then it generally causes a person to cough forcefully enough to remove the food.

Q: Observe the given diagram and answer the following questions.



i) What does the diagram show about?
ii) What are the gases exchanged ?

A: i) The diagram shows the diffusion path way for gaseous exchange between lung and blood capillaries in alveolus.
ii) Oxygen and Carbon dioxide are exchanged in alveolus.

Q: Plants undergo Photosynthesis during day time and respire during the night. Do you agree with this statement?

A: ■ No, I do not agree with this statement.
■ Plants photosynthesize during day time only since light is required.
■ Plants respire during the day and night time also. Respiration is a continuous process.
■ The Oxygen produced during photosynthesis is utilized for respiration.
■ During the night plants get oxygen from the atmosphere.

Q: What is the role of the part that is present over the glottis?

A: ■ Epiglottis is flap like muscular part which is present over the glottis.
■ This is partly closed when we swallow.
■ It deflects the food or water down to the food passage preventing their entry into the wind pipe.
■ The epiglottis opens more widely when we take a breath and air enters the lungs.

Q: After a vigorous exercises we feel pain in muscles. What is the relationship between pain and respiration?

A: ■ During vigorous exercises, oxygen supplied by blood to muscles is not sufficient.
■ So anaerobic respiration occurs in muscle cells.
■ As a result lactic acid is produced in muscles.
■ Accumulation of lactic acid in the muscles causes muscular pains.

Some instructions to the students

- Experiments to be observed carefully. Apparatus, materials required, chemicals used, precautions to be taken during experiment, testing the results etc.
- Open ended questions will be given. So you need not confine to specific answer in a single way.
- Analyse the reports, diagrams and flow charts to understand the concepts easily.