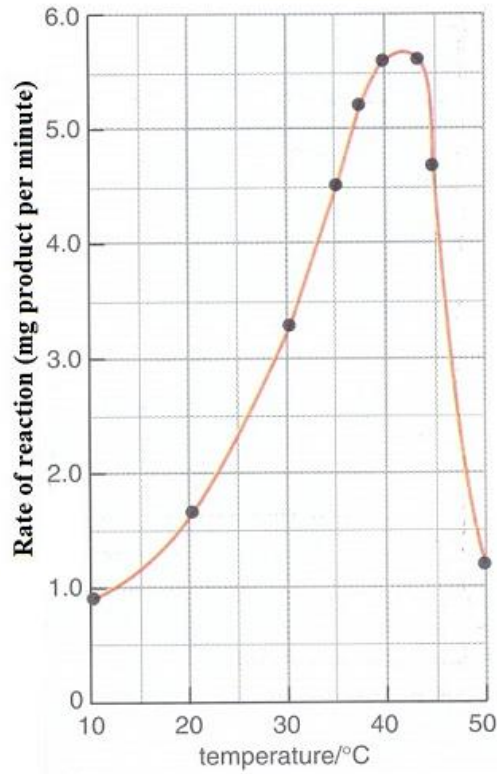


HeLP Online S.4 Biology seminar questions

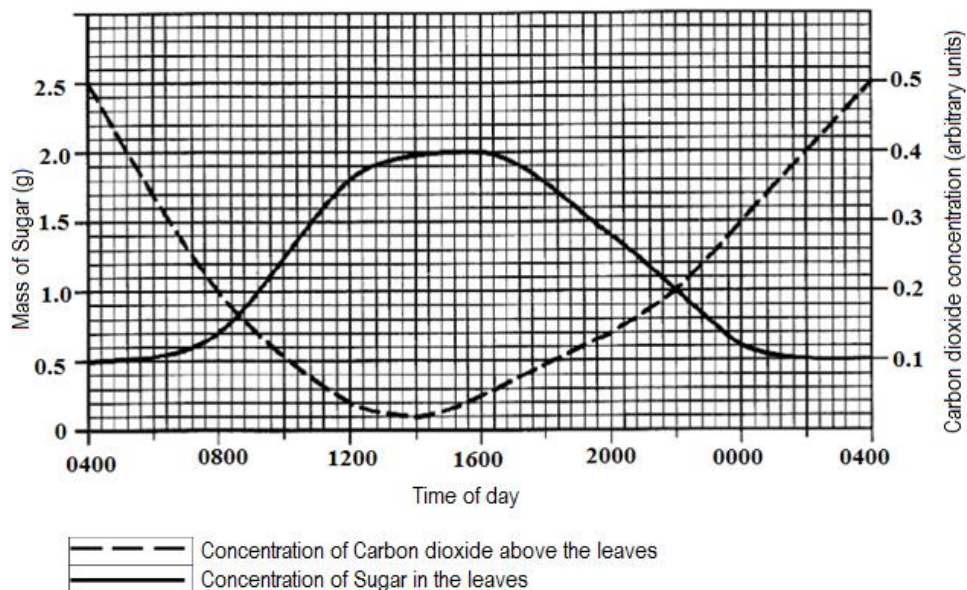
Date: 20th April, 2022

Time: 2:00pm – 4:00pm

1. A technician carried out an experiment to investigate the effect of temperature on a certain metabolic reaction. Her results are shown in the graph.



- a) Between which temperatures does the rate of the reaction
- Increase
 - Decrease
- b) At what temperature is the rate of the reaction fastest?
- c) Explain the effect of temperature on the rate of the reaction.
2. The graph below shows changes in the concentration of carbon dioxide above the leaves and mass of sugar in photosynthesizing leaves through 24 hours of the day.



- a) For the period shown, describe the changes in the:
 - i) Concentration of carbon dioxide
 - ii) Mass of sugar
 - b) For the period shown, explain the changes in the:
 - i) Concentration of carbon dioxide.
 - ii) Mass of sugar
 - c) State **two** ecological roles of photosynthesis.
3. a) Describe the role of enzymes in the digestion of proteins, carbohydrates and lipids in humans.
 - b) What are the adaptations of the ileum to absorption of digested food?
4. The table below shows the composition of three gases during breathing in humans.

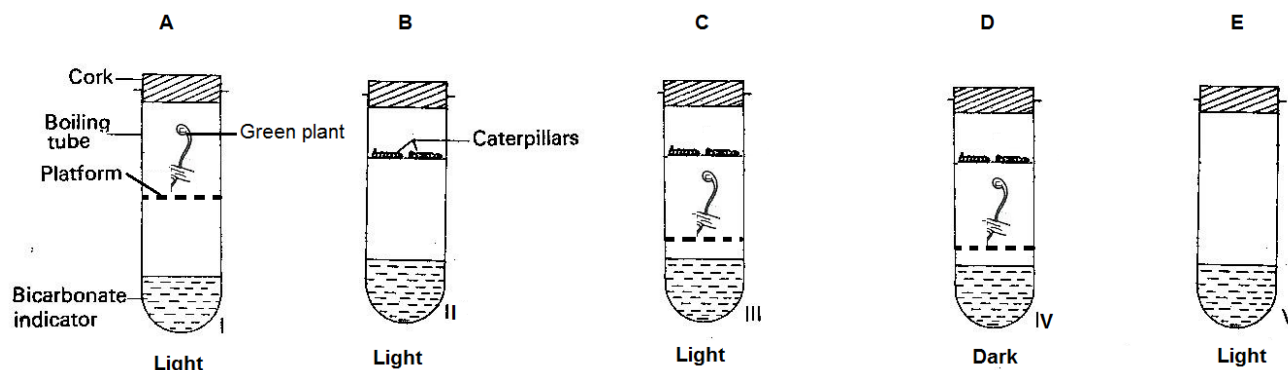
Gas	Inhaled air	Exhaled air
Oxygen	21	16
Carbon dioxide	0.04	4.0
Nitrogen	79	79

Explain the differences in the composition of the gases between inhaled air and exhaled air

- b) A bicarbonate indicator changes colour depending on the amount of carbon dioxide present as follows:

Yellow	Red	Purple
Much carbon dioxide	Normal amount of carbon dioxide	Very little carbon dioxide

Five test tubes were set up as shown in the figure below. Each one contained red bicarbonate indicator at first, and they were left for **four** hours. Study them carefully and answer the questions that follow.



With a reason in each case, state the colour you would expect the indicator to be, in each test tube.

- b) Explain the following observations:
 - i) Waterlogging of the soil may lead to death of plants.
 - ii) Mouth-to-mouth resuscitation is more effective with breathed out air than with breathed in air.
 - iii) People living in high altitudes have a higher red blood cell count and more haemoglobin than people living in low altitudes.
5. a) **Explain** how respiratory surfaces are suited for gaseous exchange.
 - b) Describe a laboratory experiment to demonstrate the breathing mechanism in humans.
 - c) How does respiration differ from photosynthesis?