Lesson Description

In this lesson we:

- Revise the endocrine system in humans
- Revise homeostasis in humans

Summary

Endocrine and Exocrine Glands

[Diagram showing the pancreas and its components, including the head, tail, lobules, common bile duct, pancreatic duct, and a section of acinar cells secreting digestive enzymes and exocrine cells secreting pancreatic juice.]
Negative Feedback Mechanism

- Mechanism that ensures that, in any control system, changes are reversed, and returned back to the set level.
- A process whereby the response by the effector is opposite to, and reverses the stimulus.
Interaction between Pituitary Gland and Thyroid Gland

- Thyrotrphin Stimulating Hormone (TSH) from the Pituitary stimulates the Thyroid.
- Thyroid releases Thyroxine.
- Elevated Thyroxine levels feedback to the Pituitary, inhibiting TSH secretion, and lowering Thyroxine levels.
- Low Thyroxine levels stimulate the Pituitary to release TSH, initiating the cycle again.
Improve your Skills

Question 1

Study the diagrams below and answer the questions that follow.

1.1 How will the diameter of the skin capillaries of the person in Diagram I compare with those of the person in Diagram II? (2)

1.2 Choose the letter of the gland in Diagram III that can be associated with the condition of the skin capillaries in the person in Diagram I. (1)

1.3 Explain your answer in QUESTION 1.2 by referring to the changes that occur in the diameter of the skin capillaries in the person in Diagram I. (7)

1.4 Give the letter of the gland in Diagram III that will be affected first if the metabolic rate of the person in Diagram II needs to be lowered at the end of the race. (4)

1.5 Explain the role played by the gland named in QUESTION 1.4 in lowering the metabolic rate. (6)

Question 2

Answer the following questions on hormones:

2.1 Name the endocrine gland which secretes each of the following:
   a.) TSH
   b.) Adrenalin
   c.) Thyroxin
   d.) Growth hormone
   e.) Aldosterone

2.2 It was found that the thyroxin concentration of a healthy adult remained very low for a period of three months.
   a.) Will the person gain or lose weight if he continued with his normal diet during this period?
   b.) Explain your answer to QUESTION 2.2 (a).
Homeostasis in Humans

Question 1

1.5 Define the term Homeostasis. (2)
1.6 Name the internal environment of humans. (1)
1.7 List FOUR factors that must be kept constant in the internal environment of humans. (4)
1.8 Explain how the concentration of carbon dioxide is regulated in the body of a person who is doing a lot of work for his team while playing soccer. (7)

Question 2

A normal blood glucose level is 1,0 mg/cm³ and a normal insulin level is 0,5 mg/cm³. A group of people with normal levels of blood glucose and blood insulin were tested over a period of 5 hours. The average values were calculated and are indicated in the graph below. Study the graph and answer the questions that follow.

2.1 What is the glucose level at 3 hours after the start of the investigation?
2.2 Describe the relationship between insulin and blood glucose by referring to the graphs.
2.3 Explain how the blood glucose level increases between 2 and 3 hours after the investigation starts, even though no food is eaten.
2.4 Name the organ in the body which produces insulin.
Question 3

The nervous and endocrine systems help to protect the human body. Use suitable examples to describe how this is achieved through a reflex action and by the hormone adrenalin.

Content: (17)
Synthesis: (3)

[20]

Links


Diabetes causes, symptoms, management: https://www.youtube.com/watch?v=sTgBvJsHcCk