

HOMEOSTASIS

1) Define homeostasis.

Ans: Keeping the internal environment of the body like temperature, amount of dissolved substances in the blood and CO₂ concentration is called homeostasis.

2) What are different control systems in the body?

Ans:

- 1) Blood temperature - Our blood temperature is 37°C. It is kept constant by the brain (Hypothalamus)
- 2) Water level - It is controlled by our kidneys
- 3) pH - Our blood pH is kept constant at 7.4 by our kidneys which get rid of excess ions
- 4) CO₂ concentration - It is controlled by our lungs.

3) Why homeostasis is important?

Ans:

- 1) It helps our cells to work as efficiently as possible. Keeping internal environment at 37°C helps enzymes to work at an optimum rate
- 2) Keeping a constant amount of water means that your cells are not damaged by losing or absorbing too much water by osmosis.
- 3) Keeping a constant concentration of glucose means there is enough fuel for the respiration process to provide energy to our bodies

4) Define homeothermic and ectothermic.

Ans: **Homeothermic:** Homeothermic is a group of organisms that can maintain a stable internal body environment without any external factor.

Ectothermic: Ectothermic is a group of organisms that can not maintain a stable internal body environment without external factor like heat from sunlight.

5) How our body controls the blood sugar when blood glucose level increases?

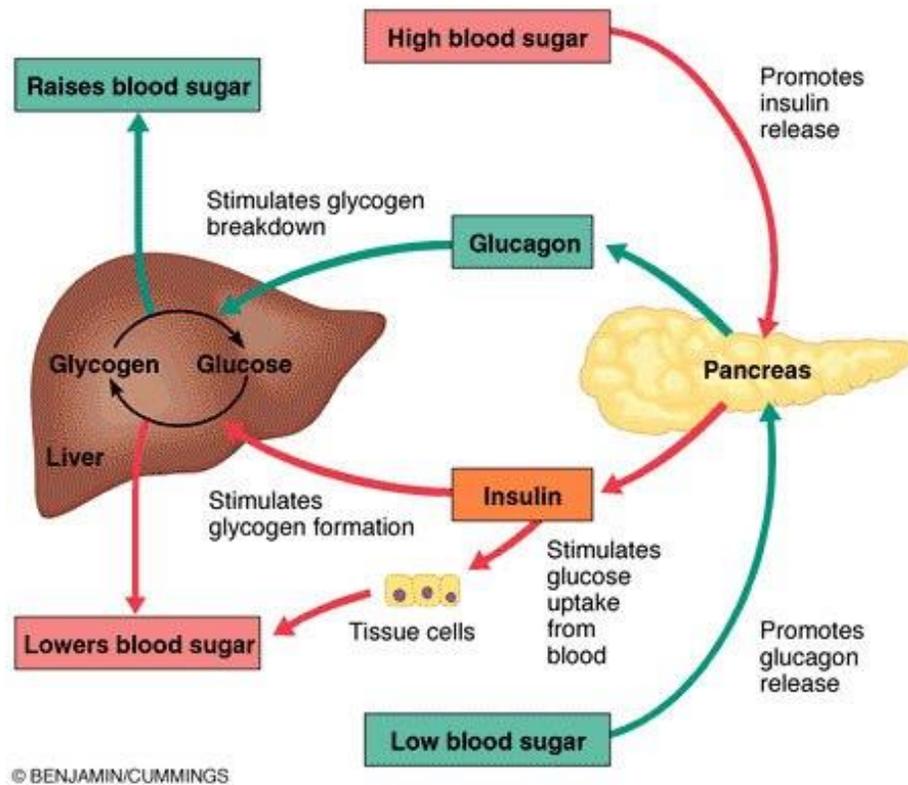
Ans:

- 1) When we take high carbohydrate meal, our glucose level in the blood increases.
- 2) Our brain detects high concentration of blood glucose while passing through it and sends a message or signal to the pancreas to release insulin hormone
- 3) Pancreas secretes insulin in the blood stream
- 4) Insulin makes the liver to absorb excess glucose from the blood and convert it into glycogen. It is then stored in the liver and muscles.

6) How our body controls the blood sugar when blood glucose level decreases?

Ans:

- 1) When we do hard work or severe exercise, our glucose level in the blood get decreased.
- 2) Our brain detects low concentration of blood glucose while passing through it and sends a message or signal to the pancreas to release glucagon hormone.
- 3) Pancreas secretes glucagon hormone in the blood stream
- 4) Glucagon makes the liver to break down stored glycogen and release glucose in the blood stream. The glucose molecules are then used in cellular respiration to release energy



7) What are the jobs of our skin?

Ans:

- 1) It regulates our body temperature,
- 2) It protects from infection and dehydration,
- 3) It responds to pressure, touch, temperature, pain etc.
- 4) It helps to excrete water and salts in the form of sweat
- 5) It acts like a barrier of immune response

8) How the constant body temperature is maintained when the temperature is too hot?

Ans: Hypothalamus is the part of the brain which continuously monitors the temperature of the blood passing over it. When it is hot, the hypothalamus sends impulses to the skin to bring about the following challenges -

- 1) **Vasodilation:** The blood vessels in our skin become wide, this causes more blood to flow to the surface so more heat is lost by radiation.
- 2) **Sweat:** Sweat glands at the base of your skin start making sweat. The sweat evaporates and causes reduction of temperature of body
- 3) **Hair:** The hair lie flat so less air is trapped in them and more heat is lost by radiation.

EXCRETION

9) Define Excretion.

Ans: The removal of toxic waste products of metabolism is called excretion. These waste products include carbon dioxide, urea, excess salt and excess water.

10) What deamination?

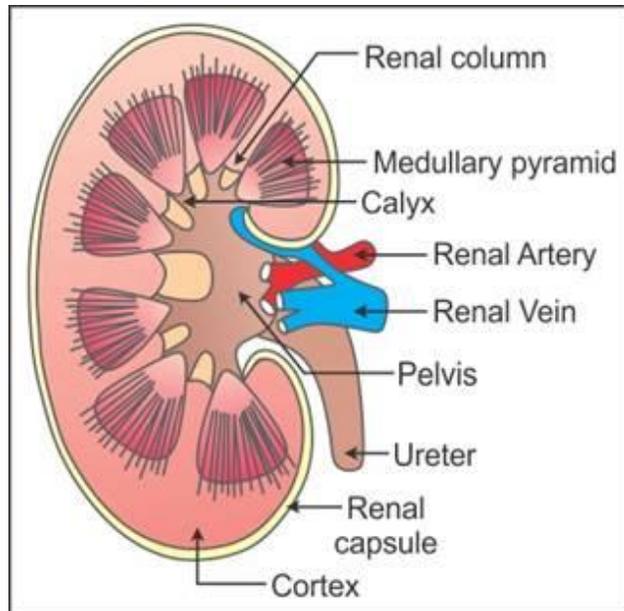
Ans: Amino acids are used to build proteins in our body and excess or unused amino acids are broken down by the liver into a waste chemical called urea. This process breaking down of amino part from amino acids and converting into urea is called deamination.

11) Briefly describe the internal structure of the kidney.

Ans: Each kidney is bean shaped. When we cut and open a kidney it is divided into two parts -

- 1) Outer darker area - Cortex
- 2) Inner lighter area - Medulla

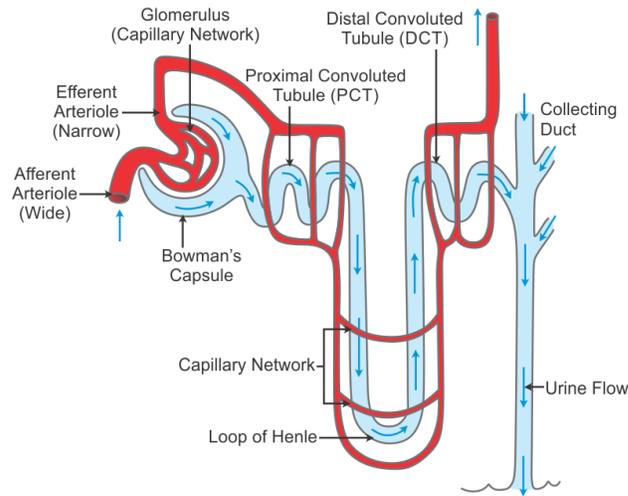
Inside each kidney there are thousands of small tubes called nephrons. These are the structures which filter out the blood coming through renal artery from the heart. The waste chemicals are turned into urine which then drains out through the ureter to the bladder.



12) Describe the structure of a nephron.

Ans: Each nephron is divided into two parts -

- 1) A cup shaped part called Bowman's capsule. It is present in the cortex of the kidney. It has small holes for the filtration of blood. Its main function is filtration.
- 2) The distal part which is coiled and some part is U - shaped. Most of it is present in cortex and here mostly re-absorption of water, glucose and some other salts takes place.
- 3) Each nephron ends into a collecting duct, several of which join together to make renal vein.



13) Draw and label the human excretory or Urinary system.

Ans:

