

Q @ (i) Why are bats and Whales considered mammals?

(ii) Write a note on liver juice "Bile".

(i) Why are bats and Whales considered mammals?

Mammals refers to the organisms that raise their young ones from on milk.

Mammals have their hair or fur, and most of them have specialized teeth that help them to cut or chew their food. Mammals in general, have highly developed nervous systems and they show intelligence and refreshfulness that only a few other animals can match.

Bats and Whales are considered mammals because:

(a) They can feed their young one through milk which is produced by mammary glands.

(b) They are warm-blooded. In other words, they are capable of regulating their body temperature.

(ii) liver Juice "Bile"

The liver is one of the most essential organs of the human body which is located at the right upper quadrant of the abdomen, under the diaphragm. The liver is a vital organ that supports nearly every other organ to some capacity.

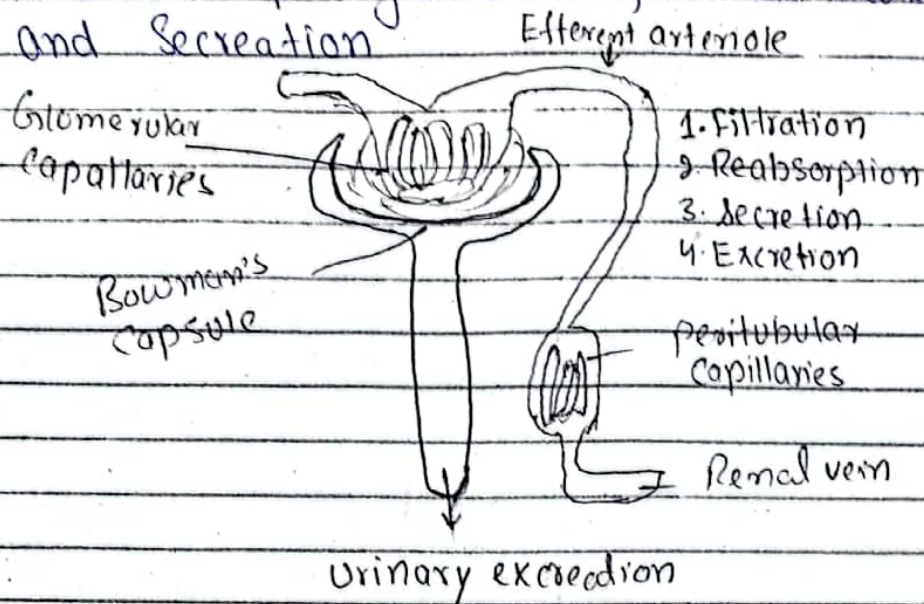
Bile is a chemical substance produced in the liver and stored in the gallbladder. Its primary function is to aid the digestion process by breaking down fats into fatty acids.

It primarily consists of cholesterol, bile acids

and bilirubin. It also contains small portions of water, salts, electrolyte chemicals, and metals such as copper.

(b) How is the urine formed? Describe the role of the kidney in excretion

The process of urine formation takes place in three steps: glomerular filtration, reabsorption and secretion



Excretion = Filtration - Reabsorption + Secretion

(a) Glomerular Filtration

Each kidney contains more than 1 million tiny structure called nephrons and each nephron contains a glomerulus which is a network of blood capillaries surrounded by the Bowman's capsule. As the blood passes through the glomerulus, it filters all the waste products and excessive fluids from it. In this way the process of urine formation starts

(b) Reabsorption

The filtrate from the glomerulus mostly consist of waste materials but also

Contains some useful substance such as glucose, essential ions, smaller proteins, and amino acids. After leaving the glomerulus, it enters the renal tubule. During its passage to the renal tubule, more useful substances are reabsorbed into the adjacent capillaries. This reabsorption of useful nutrients from filtrate is the second major step in urine formation.

© Secretion

During the reabsorption of vital nutrients and water into capillaries, waste ions, and hydrogen ions pass from the capillaries into the renal tubule. This process is called secretion. The secreted ions combine with the remaining filtrate and become urine which finally flows out of the nephron tubule into a collecting duct.

Urine passes out from the kidneys through the renal pelvis, into the ureter, and down to the bladder.

Role of Kidney in Excretion

Kidneys are dark red, slightly flattened bean-shaped organs of about 10 cm in length, 5 cm in width, and 4 cm in thickness.

Each kidney weighs about 170 grams. Kidneys play a very important role in the excretion of waste products from the body:

- i) Kidneys filter the waste products and toxins from the
- ii) The kidneys monitor and maintain the body's balance of water ensuring that the tissues receive enough water to function

properly and stay healthy.

iii) Kidneys regulate blood pressure and the level of vital salts in the blood through the production of an enzyme called renin.

iv) The kidneys secrete the hormone erythropoietin, which stimulates and controls red blood cell production.

In this way, kidneys play a vital function in the excretion and the overall functioning of human body parts.

Q) How a bacterial cell is different from a plant cell?

The cell is the basic structural, functional and biological unit of all living organisms. It is the smallest unit of life and is often called the building block of life.

These cell was first discovered by Robert Hooke in 1665.

Bacterial cell is a prokaryotic cell that is smaller in size and simple in structure. While plant cell is eukaryotic and is slightly larger than prokaryotic cells. Eukaryotic cells, on average are ten times.

Cell wall

The cell wall of bacterial cell consists of polysaccharides, lipids and proteins. While cell wall of plant comprises of cellulose.

The nucleus

Bacterial cell lacks a well defined nucleus and membrane-bound organelles. Instead, it

Contains an irregular region (cytoplasm) where the genetic material is suspended while plant cells have a well-defined nucleus and organelles.

Number of cells

Bacteria is unicellular while plants can be unicellular or multicellular.

Mitochondrion

There are no mitochondria in the bacterial cell while plant cells contain mitochondria.

Vacuole

Bacterial cells don't contain vacuoles while plant cells have a vacuole.

ii) What do you think cold-blooded animals are slowed down by low temperatures?

Animals that cannot regulate their internal body temperature concerning the change in the outside environment are known as cold-blooded animals or ectotherms. They cannot generate internal heat to cope with the temperature changes.

In other words, they have the same temperature as the air or water around them. Their body temperature is not constant. A cold-blooded animal has to stay in the sun to get warm and must find shade to cool off. Examples of cold-blooded animals include reptiles, amphibians and fish.

Cold-blooded animals are slowed down by low temperature due to the following reasons.

iii) At low temperature, the metabolism of cold-blooded animals does not work properly. Lower metabolic rate affects other body functions such as digestion, nervous

System activity, and the circulation process.

iii) All the chemical reactions in a cold-blooded animal are slowed down at temperatures. There is a decrease in energy production which slows down the overall activity.

iiii) The muscle performance of cold-blooded animals is also slowed at lower temperatures which hampers their ability to hunt, escape predators, and carry out other physical activities.

(d) What is hepatitis, its types, causes, prevention, and cure:

1. Hepatitis

Hepatitis refers to the inflammation of the liver that is typically caused by a virus or consumption of a toxic substance such as drugs or alcohol or some genetic problem. Common symptoms include loss of appetite, jaundice, yellowing of eyes and skin, diarrhea, intense fatigue, vomiting and dark urine.

2. Types of Hepatitis

There are five basic types of hepatitis.

(a) Hepatitis A

It is caused by Hepatitis A virus (HAV). It can cause mild to severe illness among patients. It generally spreads due to the consumption of contaminated food or water or close physical contact.

(b) Hepatitis B

It is caused by the Hepatitis B virus which can cause both acute and chronic illness. It spreads through contact with blood or other body fluids of the infected person or through sexual contact.

c. Hepatitis C

Hepatitis C virus became a cause of Hepatitis C. It is a blood-borne virus and the most common modes of transmission are unsafe injection practices, inadequate sterilization of medical equipment, and the transfusion of unscreened blood and blood products.

d. Hepatitis D

Hepatitis D is typically caused due to the presence of Hepatitis D virus. It can be transmitted through sharing contaminated needles or other drug paraphernalia with an infected person or from a mother to her child.

e. Hepatitis E

The Hepatitis E virus becomes a potential source of Hepatitis E. It is caused by the consumption of infected food and it is commonly experienced by frequent travelers.

3. Prevention of Hepatitis

(i) Hepatitis B and C infections are transmitted through contaminated blood as well as through contaminated needles and syringes in the healthcare setting and among people who inject drugs. The viruses can also be transmitted through unsafe sex or from mother to her child. The best prevention against Hepatitis is the vaccination of infants. Most of the children receive vaccination between the ages of 12 and 18 months. However, vaccination is also available for adults.

(ii) Implementing blood safety strategies which involve quality-assured screening of all donated blood and blood components used for transfusion can help prevent transmission of hepatitis B and C.

(iii) Safe injection practice and eliminating unnecessary

and unsafe injections are also effective strategies to protect against transmission.

iii) Safer sex practices should be adopted to prevent the transmission of different hepatitis variants. In this regard, the number of partners should be minimized and barrier protective measures should be adopted.

iv) The provision of clean water, food safety, and improved sanitation are also effective preventive measures against hepatitis.

4. Cure of Hepatitis

The cure options are determined by the type of hepatitis and whether the infection is acute or chronic.

i) Hepatitis A is a short-term illness that does not require much medication. In some cases, complete bed rest and a proper dietary program are recommended for a complete cure.

Fortunately, its vaccine also exists that helps to prevent disease by producing antibodies that fight against this type of infection. In case of vomiting or diarrhea, the patient is put on a special diet to prevent malnutrition or dehydration.

ii) Treatment of Hepatitis B involves the use of antiviral medications for several months. In addition, the patient also requires regular medical evaluations and monitoring to determine the effectiveness of medicines.

iii) People who develop chronic Hepatitis C are typically treated with a combination of anti-viral drug therapies and proper testing.

iv) WHO has recommended PEGylated interferon alpha as treatment of hepatitis D.