1. Diversity in Living Organisms

Evaluation

1. Question

Match the following.

a) Endoplasmic Reticulum __ sweat gland

b) Glandular Epithelium __ streamlined body

c) Retina __ porter

d) Kidney __ cone cells

e) Fish __ nephron

Answer

		Explanation
Endoplasmic Reticulum	porter	Keith Robert Porter (June 11, 1912 – May 2, 1997) was a Canadian-American who performed pioneering research using electron microscopy of cells. He was the one who gave the name endoplasmic reticulum to this organelle.
Glandular Epithelium	sweat gland	The type of epithelium which forms the covering of all major glands. Sweat glands are exocrine glands which secrete sweat which is to be excreted from the body, thus covered by glandular epithelium.
Retina	cone cells	Cone cells are the photoreceptors present in the retina of mammalian eyes.
Kidney	nephron	The nephron is the microscopic structural and functional unit of the kidney.
Fish	streamlined body	Fishes are the class of phylum chordate which have streamlined body which aids them in swimming. Such a type of body helps them in orientation of fish movement in a particular path.

2 A. Question

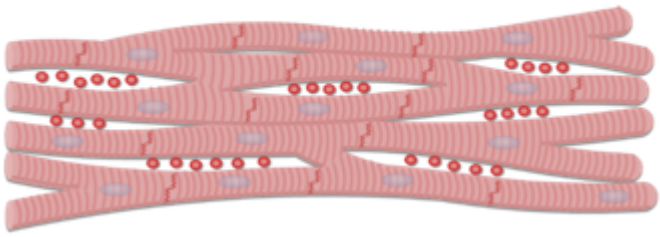
Muscle fibres are branched in (cardiac/ skeletal) muscle.

Answer

Muscle fibres are branched in cardiac muscle.

The diagram of cardiac muscle is shown below:

Cardiac muscle tissue.



Such type of branched arrangement helps the cells to communicate with each other. They form a giant network. They are connected to one another at ends by intercalated discs.

2 B. Question

Bone and cartilage are types of (nerves/ connective) tissues.

Answer

Bone and cartilage are types of connective tissues.

Bone and cartilage are considered as connective tissue because they connect different tissues and organs and provide support to other structures of the body.

2 C. Question

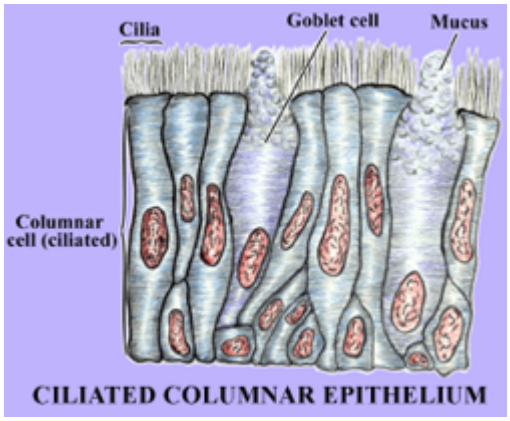
Ciliated epithelium is found in (trachea / oesophagus)

Answer

Ciliated epithelium is found in trachea.

ciliated epithelium is a type of epithelium which contains hair like structures known as cilia which move in a manner to transport particles. This type of epithelium is present in trachea which acts as a barrier to pathogen thus preventing infections and tissue injury. It also moistens and protects the airways.

The diagram is shown below:



3. Question

Choose the correct answer:

i) Assertion: The image falls on Fovea

ii) Reasoning: Because of refraction of light by vitreous humors

a. A is correct B is wrong

b. B is correct A is wrong

c. B explains A

d. A explains B.

Answer

c. B explains A

Explanation: human eyes project light to produce sharp images. Light rays from distant object are focussed on retina through cornea, aqueous humor, the lens and then to vitreous humor. The light rays show the phenomenon of refraction due to change in the refractive index of the different mediums. This is how light is focused on retina reaching fovea which have highest density of cone cells.

4. Question

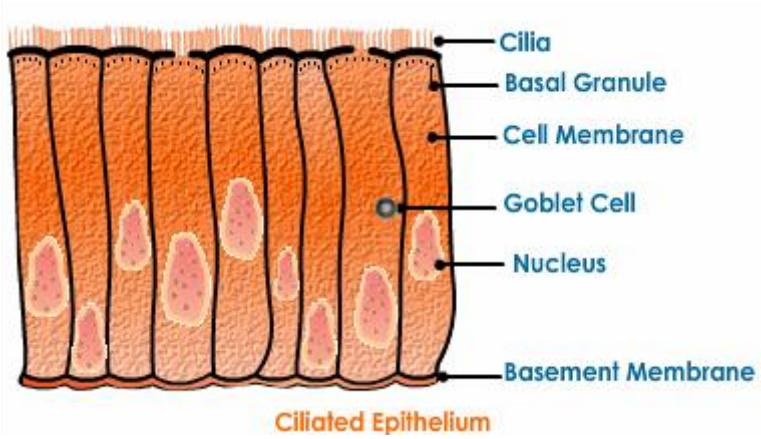
Complete the table by filling the functions.

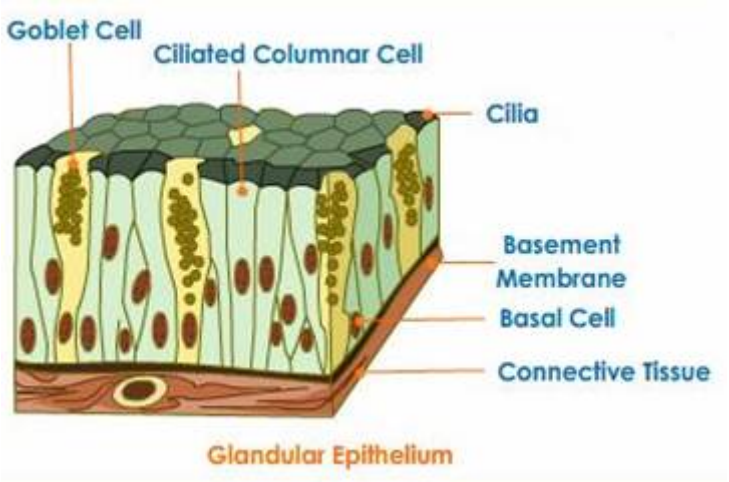
Tissues	Functions
1) Columnar epithelium	
2) Glandular epithelium	
3) Ciliated epithelium	

Answer

Tissues	Functions
1) Columnar epithelium	They secrete digestive enzymes and absorb digested food.
2) Glandular epithelium	They form the protective lining of different glands.
3) Ciliated epithelium	They have tiny hair cells called cilia which remove secretion or foreign bodies from epithelial surfaces.

The diagrams are shown below:





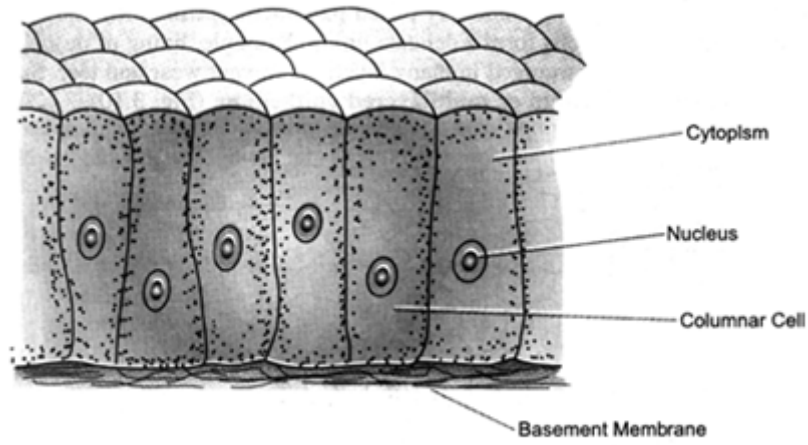
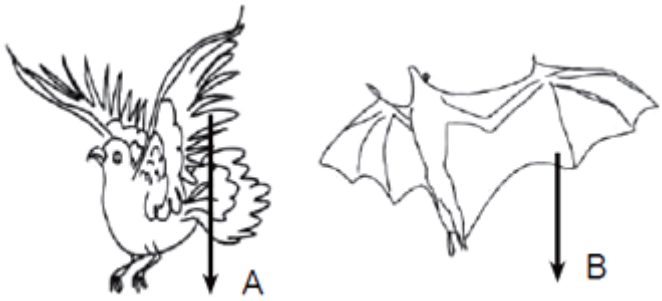


Figure : COLUMNAR EPITHELIUM

5. Question

i) Identify part A and part B.

ii) How does part A differ from part B?



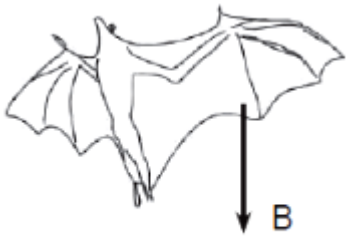
Answer

A. wings of birds

B. wings of bats

i) The diagram is labelled as:

Wings of Bird



Wings of Bat

ii) The wings of birds and bats are analogous structures that mean they have same functions and different origin i.e. separate evolutionary origin. These structural changes are result of convergent evolution.

6. Question

Our kidneys help our body to lead a healthy life - How?

Answer

1. Living with a healthy body is the best road to live happy, to feel better, and to look better.

2. Different organs and organ systems works in a coordinated manner to achieve this goal. Kidneys are one such organ which helps our body to lead a healthy life.

3. The kidneys are the filtering organs of blood. The kidneys shed waste products from metabolism of wastes such as urea, uric acid crystals, and creatinine by secreting urine. Urine may also contain trace amount of sulfate and phenol waste and excess sodium, potassium, and chloride ions.

4. The kidneys play major role in maintaining homeostasis by regulating the concentration and volume of body fluids. For example, the amount of H^+ and HCO_3^- secreted by the kidneys controls the body's pH. They also regulate the blood pressure of an organism by secreting hormones.

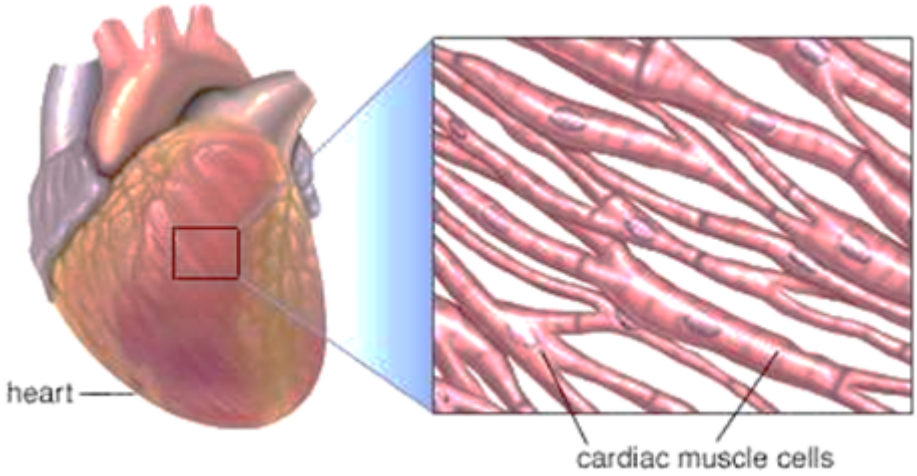
7. Question

Can you name and describe the muscle which is present only in our heart and works throughout our life?

Answer

Cardiac muscles are the muscles of heart which works in a regulated manner throughout our life.

Description:



STRUCTURE OF CARDIAC MUSCLE

1. Cardiac muscle, synonym for heart muscle, is the layer of muscle tissue present between the endocardium and epicardium. These inner and outer layers of the heart, respectively, surround the cardiac muscle tissue and separate it from the blood and other organs.

2. Cardiac muscle is made from sheets of cardiac muscle cells. These cells, unlike skeletal muscle cells, are typically unicellular connected to one another through special intercalated discs. These specialized cell junction and the arrangement of muscle cells enable cardiac muscle to contract quickly and repeatedly, forcing blood throughout the body.

3. Cardiac muscles are composed of tubular cardiomyocytes, or cardiac muscle cells. The cardiomyocytes are composed of tubular myofibrils, which are repeating sections of sarcomeres.

4. Intercalated disks transmit electrical action potentials between sarcomeres.

8. Question

Identify the odd item from column A and write it under column B. Write the common features of the other two items in column.

Synod	A	B	C
1.	Cristae, Matrix, Ribosome		
2.	Nerve, Muscle, Golgi apparatus		

In Column A, 3 terms are given of which 2 belong to one group and 1 remains odd. Identify the odd item and write it under Column B. Write the common features of the other two under Column C.

Answer

Synod	A	B	C
1.	Cristae, Matrix, Ribosome	Ribosome	a.) The folds of inner mitochondrial membrane which increases surface area are called cristae. They carry proteins and essential enzymes used for making chemical energy of the cell. b.) The gel like material between outer and inner compartments of mitochondria is called matrix having less water than cytoplasm making it more viscous. It provides sites for various bio-energetic metabolisms such as citric acid cycle.
2.	Nerve, Muscle, Golgi apparatus	Golgi apparatus	a.) A bundle of fibres that delivers and receive messages between the body and the brain are called nerves. They have the property of extensibility and conductivity. They have dendrites, cell body and axons. b.) Set of soft tissues responsible for the posture, movement etc. is called a muscle. They are made up from actin and myosin filament. It has a unique feature of contractility.

9. Question

Copy the diagram of the human eye. Label the following parts:

a. The transparent part of the sclera.

b. The spot on the retina where cones are most abundant.

Answer

a. The transparent part of the sclera

b. The spot on the retina where cones are most abundant: fovea