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Subjective

Question no 5 (Section-I)

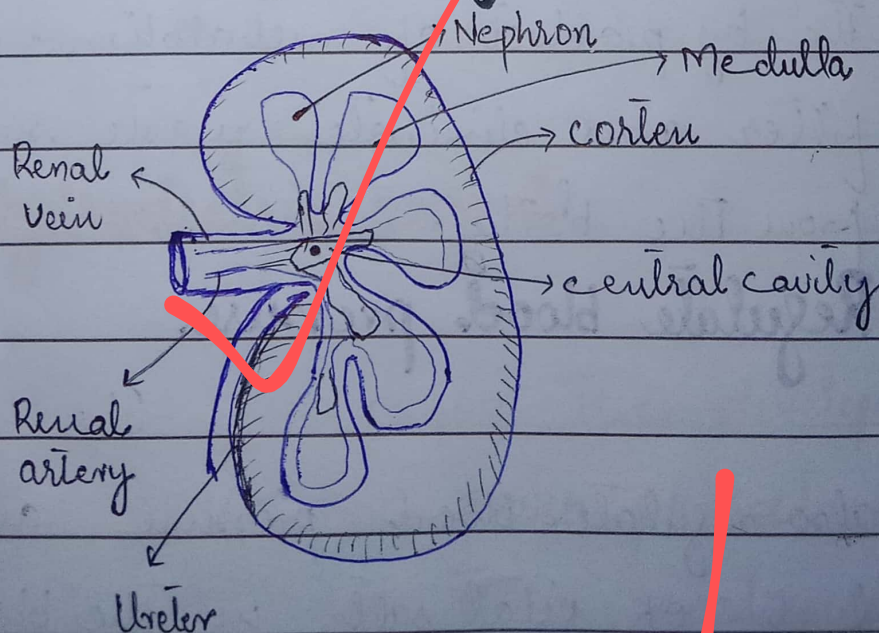
(a)

Structure of kidney in excretory system

Introduction:

The kidneys are dark-red, slightly flattened, bean shaped organs about 10cm long, 5cm wide and 4cm thick and each weighing about 270g.

Structure of kidney:



Functions:

Nephron:

The main function of nephron are related to filtering, reabsorbing and secreting glutamate, carbohydrates and solutes.

Ureters:

Ureters conduct urine from the kidneys to the urinary bladder.

Medulla:

The medulla is subdivided into conical masses, the renal pyramids. It maintain the balance of the body.

Filter material:

Urine is produced by the kidney and it contains the by product of metabolism. It filter and eliminate waste substance from the body.

Regulate blood pressure:

The kidney also regulate blood pressure and level of vital salts in the blood.

(b)

Renewable energy sources under CPEC

CPEC aims to facilitate and boost the use of renewable resources.

Several key renewable resources are:

Solar energy projects:

CPEC includes plans to establish solar farms and solar parks, aiming to harness the abundant sunlight available in many parts of the country.

Wind energy projects:

CPEC aims to capitalize on this by constructing wind power plants to generate electricity.

Hydroelectric projects:

The corridor also focuses on the development of hydroelectric power projects.

Date: _____
and expansion of dams and hydro-
electric power plants.

Biomass Energy:

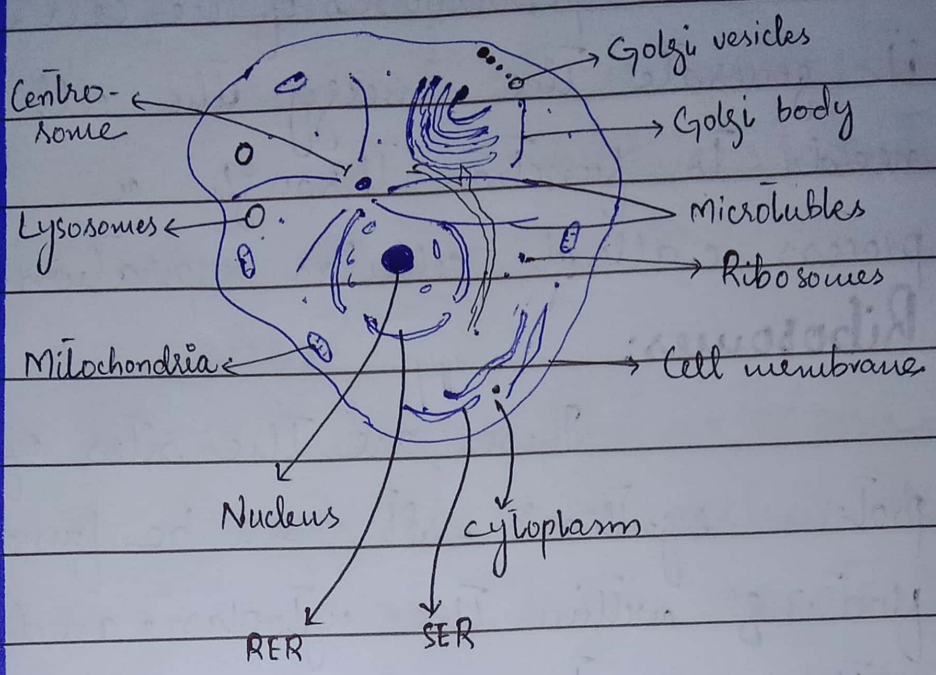
Although not the primary focus, CPEC also acknowledges the potential of biomass energy. Agricultural waste and other organic materials could be used to generate energy, providing both a renewable energy source and a method of waste management.

(C)

Different parts of cells in human body

Cell is the unit of structure and function of all living things.

The cells that make up our body are so small that one cannot see a single naked eye. Cells are often divided into particular groups based on major characteristics.



Nucleus:

It is a prominent body of the cells. It is often considered the cell's control center, the nucleus contains most of the cell's genetic material (DNA). It regulates gene expressions.

Cytoplasm:

Cytoplasm is the jelly like substance that fills the cells, surrounding the nucleus and other organelles. It is the site for most of the cell's metabolic activities.

Mitochondria:

Mitochondria is

called the powerhouses of the cell, it generates the energy the cell needs to function through a process called cellular respiration.

Ribosomes:

These are the sites of protein synthesis. It can be found floating within the cytoplasm and attached to endoplasmic reticulum.

Endoplasmic Reticulum: (ER)

The ER is a network of membranous tubules within the cell. It plays a role in protein and lipid synthesis.

Golgi apparatus:

This organelle modifies, sorts and packages protein and lipids for storage and transport out of the cell.

Plasma membrane:

This is the outer lining of the

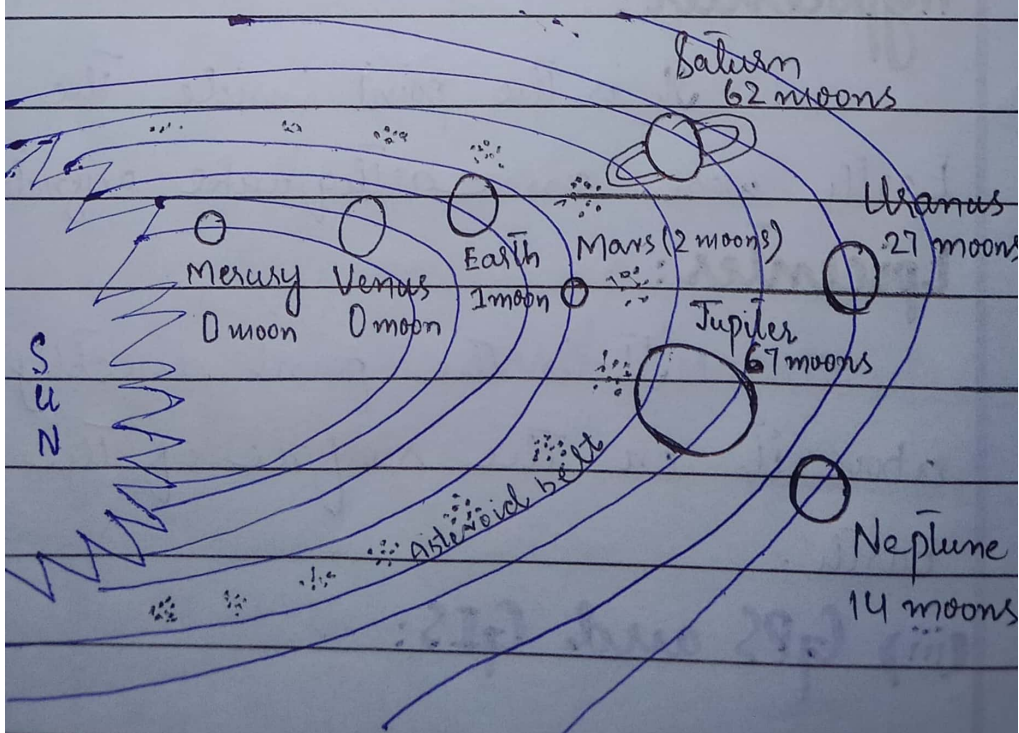
cell, which separates the cell from its environment. It is semi-permeable allowing certain substances to enter or leave the cell.

Lysosomes:

lysosomes break down waste materials and cellular debris. They can also trigger apoptosis, the process of programmed cell death.

(d)

Draw Solar System including moons of each planet



Question no 4

(a)

Distinguish the following in **one** sentence:

(i) Cyclones and Tornadoes

Cyclones:

Cyclones are large scale air mass movement around a low-pressure center, affecting large areas.

Tornadoes:

Tornadoes are narrow, violently rotating columns of air extending from the thunderstorm to the ground.

(ii) Hypocenter and Epicenter:

Hypocenter:

It is the point inside the Earth where an earthquake originates.

Epicenter:

It is the point directly above it on the surface of the Earth.

(iii) GPS and GIS:

GPS:

It is a satellite based navigation system that provides location and time information.

GIS:

It is a computer system used for capturing, storing, checking and displaying data related to positions on Earth's surface.

(iv) RAM and ROM

RAM:

RAM is the type of computer memory that can be accessed randomly and is volatile.

ROM:

ROM is non-volatile memory that is pre-written and retains its data without power.

(v) Pesticides and Insecticides

Pesticides:

Pesticides are chemicals used to kill or control variety of pests including insects, weeds, fungi

and rodents.

Insecticides:

Insecticides are a specific type of pesticide designed solely to kill or control insects.

(b)

Occurrence of Volcanic Eruption

Inside the earth, there is red-hot liquid rock, called magma. Volcanoes occur when magma rises to the surface of the earth. Volcanic eruption occur in three ways

Via Subduction:

The subducting slab dehydrates to form new melt that will rise through the crust to be erupted at the surface.

Via rifting:

When two plates pull apart magma rises, producing volcanic eruptions at the surface.

Hotspots:

Hotspots do not necessarily occur along a plate boundary. Hot spots are hot mantle plumes breaching the surface in the middle of a tectonic plate.

(C)

Pyrolysis, incineration and composting in Solid Waste Management

In solid waste management pyrolysis, incineration and composting are three distinct processes used to handle and treat waste material.

Pyrolysis:

Pyrolysis is a thermal chemical decomposition process that breaks down organic material in the absence of oxygen at high temperature, between 400°C to 800°C .

Use:

It is useful for treating

plastic and rubber waste converting them into valuable byproducts.

Incineration:

Incineration involves burning waste materials at high temperatures typically above 850°C in the presence of oxygen.

Use:

This process reduces the volume of waste by up to 90% and produces heat, which can be used to generate electricity or heat buildings.

Composting:

It is a biological process that decomposes organic waste material such as food scraps, yard trimming and certain type of agricultural wastes under controlled aerobic conditions.

(d)

Balanced diet

Definition:

"A balanced diet is a diet which includes right amount of all the nutrients such as proteins, vitamins, minerals, fats, carbohydrates etc for proper growth, development and normal functioning of the body."

Components of Balanced diet:

Carbohydrates:

Our main source of energy.

Proteins:

It is essential for growth and repair of muscles and other body tissues.

Fats:

One source of energy and important in relation to fat soluble vitamins.

Vitamins:

Water and fat soluble vitamins play important roles in

many chemical processes in the body.

Minerals:

Inorganic elements occurring in the body. These are critical to body's normal functioning.

Section - I

(a)

Find the missing numbers

(i) 11, 13, 17, —, 23

11, 13, 17, 19, 23

(ii) 10, 28, 91, 91, 370,

10, 28, 91, 370, 480

(b)

Cloth merchant bought = 35 shirts

each at a price = Rs. 280

Sold each of them = Rs. 308

percentage of profit = ?

Solution:

$$\text{Profit} = 308 - 280$$

$$= \text{Rs } 28$$

$$\text{Profit percentage} = \frac{\text{Profit} \times 100}{\text{Cost Price}}$$

$$= \frac{28 \times 100}{9800}$$

$$= \frac{2800}{9800}$$

$$= \frac{2800}{9800}$$

$$= \frac{2800}{9800}$$

$$\boxed{\text{PP} = 0.28 \text{ percent}}$$

(c)

IQ of a child whose actual age = 10 years

Chronological age = 12 years.

$$\text{IQ} = ?$$

Solution:

$$\text{IQ} = \frac{\text{actual age}}{\text{Chronological age}}$$

Chronological age

$$\text{IQ} = \frac{12}{10} \times 100$$

$$\text{IQ} = 12 \times 100$$

$$\boxed{\text{IQ} = 120}$$

(d)

average height of 30 boys = 150 cm

$$\begin{aligned}\text{So the total height} &= 150 \times 30 \\ &= 4500 \text{ cm}\end{aligned}$$

$$\begin{aligned}\text{Correct sum} &= 4500 - 135 + 165 \\ &= 4350\end{aligned}$$

$$\begin{aligned}\text{Correct mean} &= \frac{\text{Correct sum}}{30} \\ &= \frac{4350}{30}\end{aligned}$$

$$\text{Correct mean} = 151 \text{ cm}$$