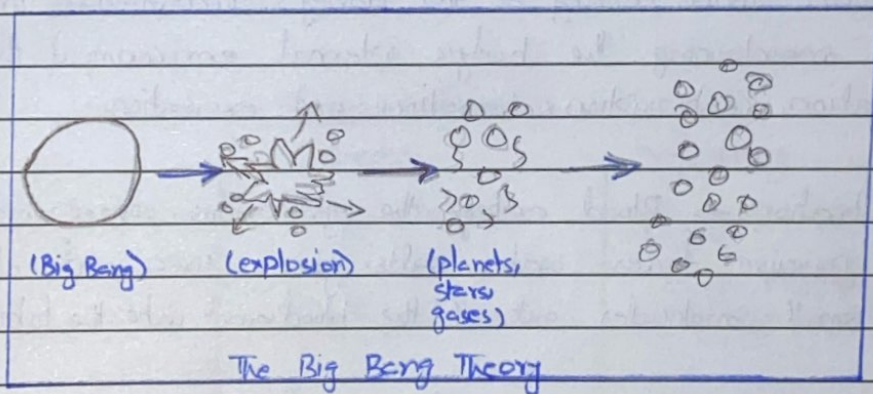


General Science & Ability

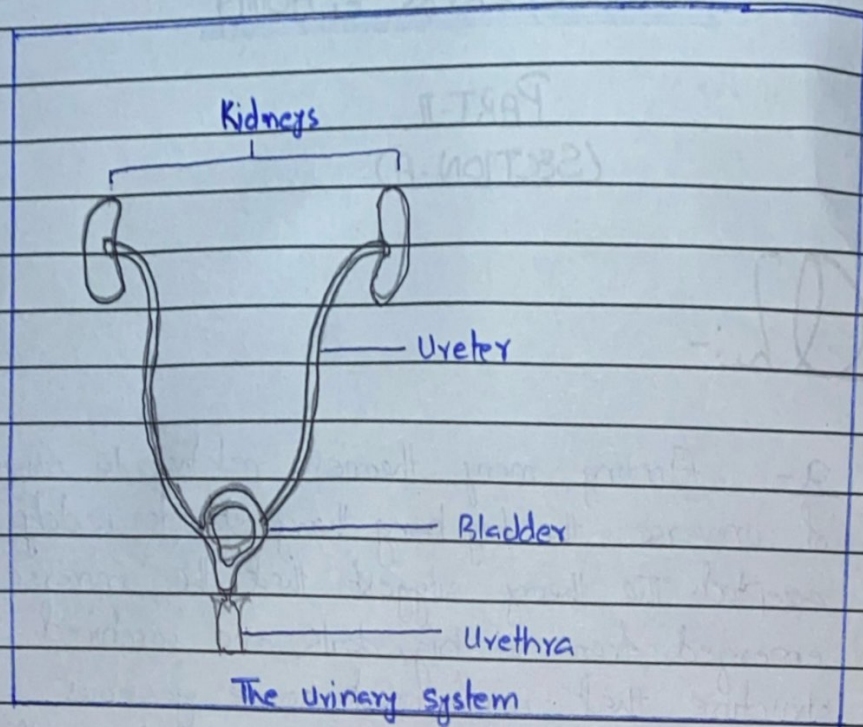
PART-II (SECTION-A)

Q2:-

a- Among many theories relating to origin of universe, the big bang theory stands widely accepted. The theory suggests that the universe emerged from a big, dark, and combined structure that underwent some gaseous reaction and had a massive blast resulting in creation of whole universe. The idea was first proposed by Georges Lemaitre, he gave it scientific form.



b- The urinary system in human body is responsible for removal of waste products. It serves as a system of filtration, consisting of two kidneys, ureters, bladder and urethra. It mainly removes excess fluid, and toxins from the blood, producing and excreting urine to maintain body's internal balance (homeostasis). The kidneys filter blood to form urine, which travels via the ureters to the bladder for storage and then leaves the body through urethra.



Working of Nephron

The main function of nephron is to filter blood, remove waste and balance fluids and electrolytes to form urine, acting as the kidney's fundamental unit for maintaining the body's internal environment through filtration, reabsorption, secretion and excretion.

- Filtration → Blood enters the glomerulus, where high pressure forces water, salts, glucose, urea and other small molecules out of the blood and into the tubule.
- Reabsorption → As the filtered fluid enters tubule, essential substances like most water, glucose, amino acids and necessary ions are absorbed back into the blood stream.
- Secretion → Waste products, excess ions and certain drugs are actively transported to the tubules for removal.

• Excretion → The final fluid, now urine, moves from the collecting ducts out of the kidney to be stored and eliminated from body.

C- Unbalanced diet

An unbalanced diet is the one in which essential macro and micronutrients enter the body without adequate proportions. Sometimes there is deficiency in the nutrient and sometimes excess. This leads to certain health risks, ranging from fatigue to chronic diseases like obesity or diabetes.

How it affects healthy living?

Unbalanced diet, if consumed in little or excess leads to certain conditions, some of them are:

Macronutrients

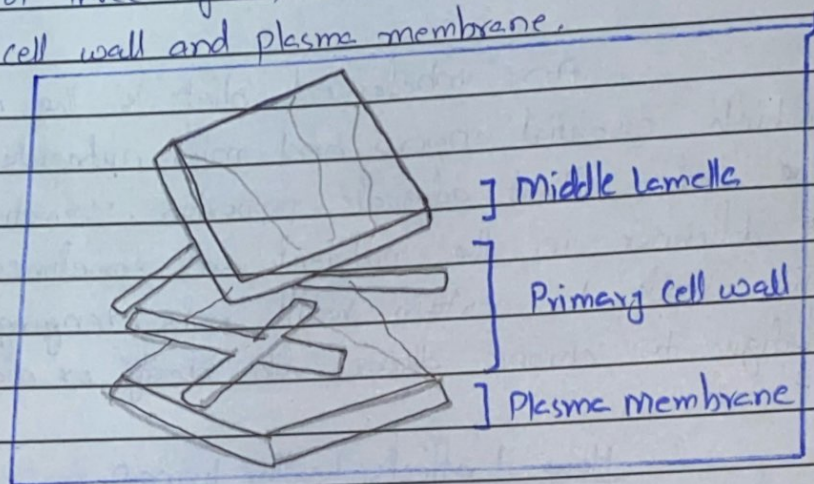
	<u>Excess</u>	<u>Deficiency</u>
• Proteins	Kidney strain, digestive issues.	Muscle loss, impaired growth
• Fats	Obesity, heart diseases	Vitamin Malabsorption Obesity , heart diseases
• Carbohydrates	Heart diseases, Weight gain	Fatigue, Brain fog

Micronutrients

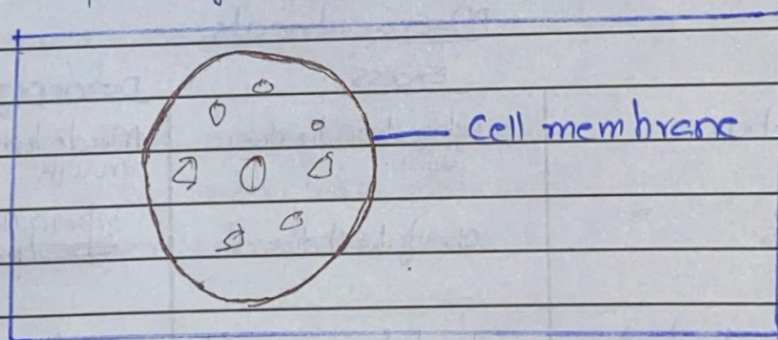
	<u>Excess</u>	<u>Deficiency</u>
• Vitamin A	Hypervitaminosis	Nyctalopia
• Vitamin C	Nausea, Diarrhea	Scurvy
• Vitamin D	High blood calcium	Rickets

d. Structure of cell wall, cell membrane, cytoplasm and mitochondria

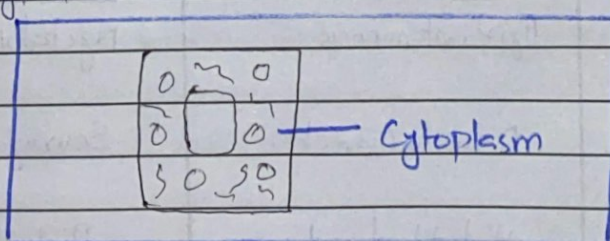
- Cell wall: It is only present in plants, cell, it consists of three layers, the middle lamella, primary cell wall and plasma membrane.



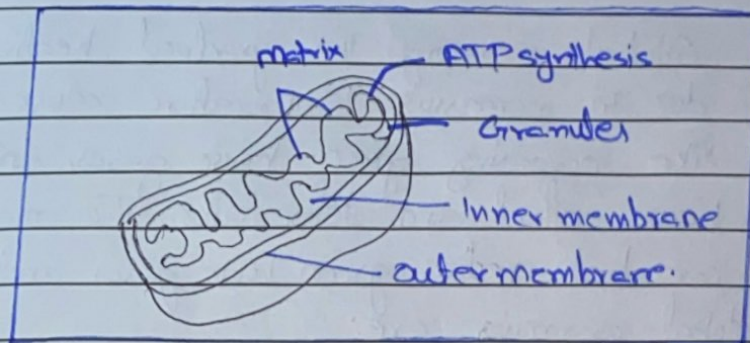
- Cell membrane: It is also called plasma membrane, is found in all cells and separates the interior of cell from the outside environment. It consists of lipid bilayer that is semi permeable.



- Cytoplasm: It is a dynamic, organized system filling the cell, composed of jelly like cytosol, various suspended organelles and a protein based cytoskeleton.



- mitochondria: It is a double membrane structure with an outer smooth membrane and folded inner membrane forming cristae.



Function of cell wall, cell membrane, cytoplasm, and mitochondria

- Cell wall: The primary function of cell wall, only found in plant cell, is formation of thick protective layer and providing hard structure.
- Cell Membrane: It is a semi permeable membrane that serves as a layer of protection in animal cell. It surrounds the cell and lets essential substances enter the cell.
- Cytoplasm: It is a fluid found in both animal and plant cell. It serves as a region where other organelles move smoothly inside the cell.
- Mitochondria: It is known as powerhouse of the cell. It primarily generates energy through cellular respiration to fuel cell activities.

x ————— x

Q3:-

A- Global warming, the gradual heating of earth due to increasing temperature cause by factors like increasing green house gases, enhanced green house effect and deforestation. The measures that can help reduce green house gases and overall global warming are:

- Limiting CO₂ emissions

Carbondioxide is a major culprit behind global warming. To reduce global warming, carbon emission needs to be cut and alternatives should be adopted and promoted such as use of renewable energy sources like, hydel, solar and wind.

- Reforestation and Afforestation

Forests are natural absorbers of CO₂, they serve as lungs of the planet to purify the air. The places where trees are cut should again be reforested and new places should also be used for new forests.

- Transform Transportation

Transportation means should be shifted from old carbon emitting vehicles to electric vehicles and more over electric public transports with full comfort should be promoted to cut the carbon rate in atmosphere.

- Reducing Food waste

Minimizing food waste and shifting towards plant-rich diets can help reduce global warming. As meat and dairy production are significant emitters.

- Reducing Electricity Consumption

Most of the electricity is generated by means like burning coal, oil and gas. The use of electricity should be reduced to limit the burden on earth.

b- Defining Ceramics

Ceramics are inorganic, non metallic solids made from natural or synthetic materials like clay, powders and other elements, shaped and then hardened by intense heat. Ceramics include everyday items like pottery, bricks, and tiles as well as advanced materials used in electronics, aerospace and medicine.

Properties and applications of ceramics

Properties

The key properties of ceramics are high hardness and strength; high temperature resistance, electrical insulators, brittleness, non magnetic and thermal insulation.

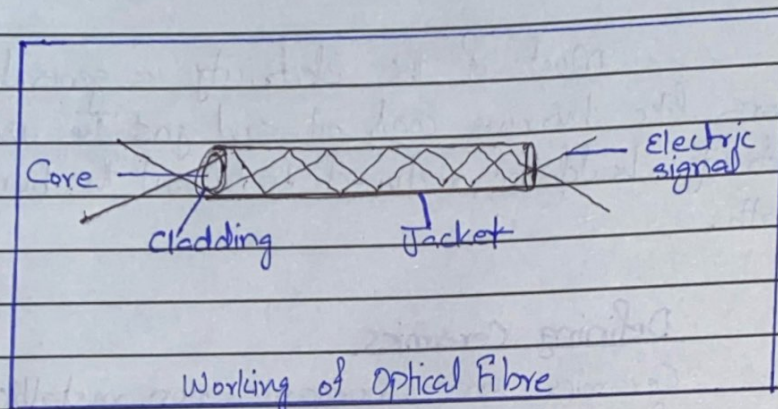
Applications

Ceramics are used in construction, automotive, electronics, aerospace, biomedical, industrial and household uses.

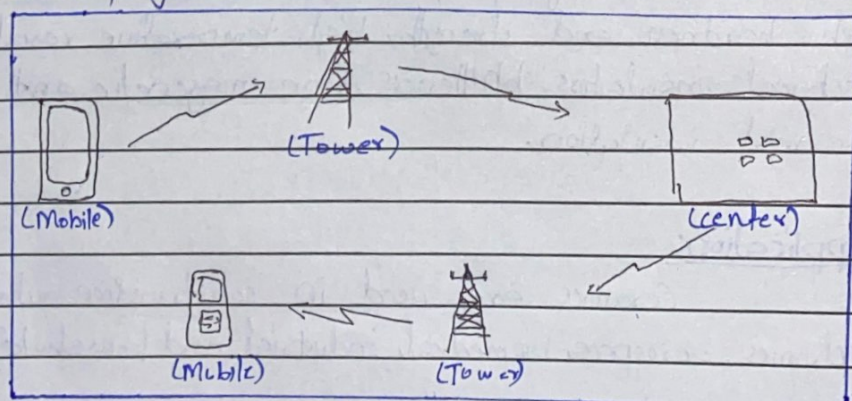
c.

Working of Optical fibres

Optical fibres or fibre optics are glass made thin strands used for transmission of electric signals from one place to another. Optical fibres work on the principle of total internal reflection.

Working of Mobile Phone

Mobile phone is an electronic device used for communication between people. They work by converting the voice/data into digital signals, which are then transmitted as radio waves to nearby cell towers, forming a cellular network that relay these signals across towers to recipient's phone, which reverses the process to play sound or display data.



d-

1. Food Additives

Food additives are substances added to food to improve its taste, color, texture, appearance or shelf life.

- example →
- Food coloring added to candies or drinks.
 - Emulsifiers used in chocolate to keep ingredients mixed.

2. Food Preservation

Food preservatives are substances added to food to prevent spoilage caused by bacteria, fungi, or chemical changes, helping food last longer.

- example →
- Salt used to preserve meat or fish.
 - Sugar used in jams and jellies.

3. Food Adulteration

Food adulteration is the intentional lowering of food quality by adding inferior, harmful, or unnecessary substances or removing valuable nutrients.

- example →
- Mixing water in milk.
 - Adding chalk powder to flour.

4. Food Contamination

Food contamination occurs when food becomes unsafe due to accidental presence of harmful substances, such as microorganisms, chemicals or foreign objects.

- examples →
- Bacteria like salmonella in undercooked eggs.
 - Hair or dust falling into uncovered food.

Section - BQ6:

9-

- The only daughter of Ahson's brother is Ahson's niece
- The woman's grand daughter is that niece.
- So, the woman is grandmother of Ahson's niece.
- The grandmother of Ahson's niece would be Ahson's mother.

Answer $\rightarrow$ Ahson's mother.

b-

solution

Let the length : Breadth = 3:2

So,

$$\text{Length} = 3x \text{ \& Breadth} = 2x$$

Step 1- Find the perimeter of the park

speed of cycling = 12 km/h

Convert to meters per minute:

$$12 \text{ km/hr} = 200 \text{ m/min}$$

Time taken = 8 minutes

Perimeter = distance covered

$$200 \times 8 = 1600 \text{ m}$$

Step 2- Use perimeter formula

$$\text{Perimeter of rectangle} = 2(L+B)$$

$$2(3x+2x) = 10x$$

$$10x = 1600 \Rightarrow x = 160$$

Step 3- Find the length & breadth

$$L = 3x = 3 \times 160 = 480 \text{ m}$$

$$B = 2x = 2 \times 160 = 320 \text{ m}$$

Step 4 - Find area

$$\text{Area} = L \times B = 480 \times 320 = \boxed{153,600 \text{ sq.m}}$$

(THE END)