

SECTION A

Question 2

Part i

UNIVERSE

"Sum total of all matter and energy that exist or existed in time and space."

Components of

Universe

- Stars
- Galaxies
- Dust and gas
- Comets and Meteoroids
- Stellar and inter-stellar
- Matter and Dark matter

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Structure of Universe

According to Big Bang

Theory

Claims of Big Bang Theory:

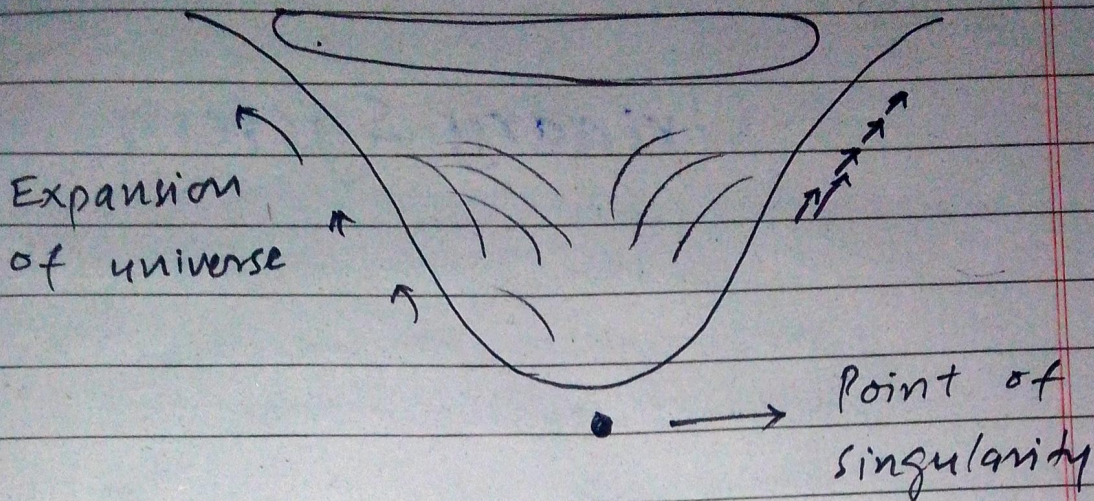
Universe came out of explosion of point of singularity, consisting matter and energy approximately 13.7 B years ago.

Expansion of Universe

Expansion took place with gradual cooling down of hot matter.

Formation of Atoms:

- * Matter and Anti-matter destroyed each other
- * The most stable remanent were protons and neutrons.
- * They combined to form Helium and Hydrogen.



Influence of Gravity:

Condensed clouds formed
Galaxies and stars

Current structure of Universe

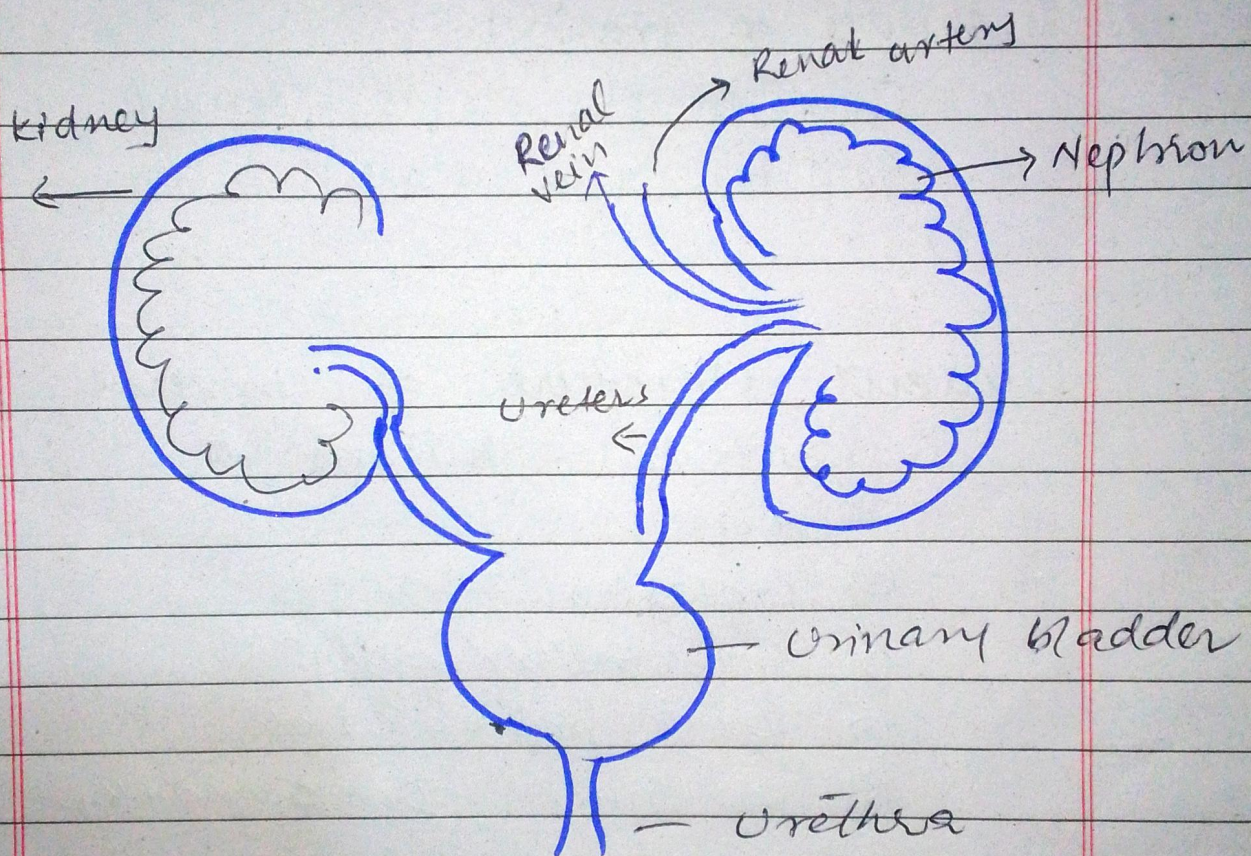
- Contains Billions of

- ① stars
- ② Galaxies
- ③ Interstellar gases
- ④ Dust particles etc.
- ⑤ unknown Dark matter

Part b

Urinary System

The system that is responsible for removal of waste from body through urine is known as urinary system.

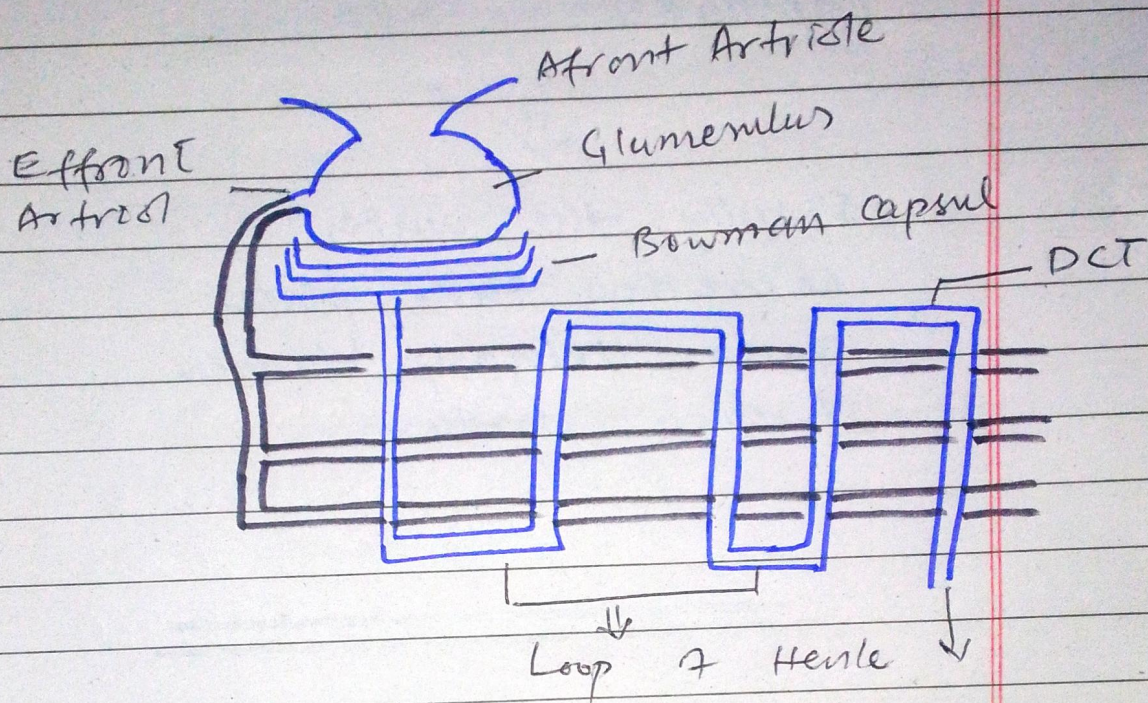


Structural Components:

- Two Kidneys with Nephrons
- Two ureters
- One Urinary bladder
- Urethra for excretion.

Role of Nephron

- Nephron is structural and functional unit of kidney.
- Millions of nephron present in kidneys.



Filteration takes place in Glomerulus



Bowman capsule just support Glomerulus



Further filteration takes place in PCT and DCT



Urine then collected

Urine collected in common Duct



Reabsorption of salt & water

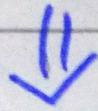


Urinary Bladder

common Duct



water and salt
are further reabsorbed
and essential nutrients
went to body through
capillaries



Finally the water
excretion take place
from Urinary bladder
through Urethra



Unbalanced Diet

"Intake of inappropriate quantities of essential nutrients is called unbalanced diet."

Essential Nutrients

① Macro Essential Nutrients

- Carbohydrate
- Proteins
- Lipids

② Micro - Essential Nutrients

- Vitamins
- Waters
- Essential elements.

How Diet become

Imbalanced ?

- Excessive/^{fewer} intake of any essential nutrient result in imbalance of diet.

* Frequency of physical activities also affect balance diet.

Effects on Health

From Unbalanced Diet

① Excessive Intake of Nutrients:

It can cause:

- ① Diabetes
- ② Obesity
- ③ High Blood pressure
- ④ Chronic heart diseases
- ⑤ Increase of Cholesterol

② Deficiency of Essential

Nutrients:

It can cause:

- ① Anemia
 - ② Weaken metabolism process
 - ③ Ricket & scurvy
 - ④ Vitiligo and Cheliosis
 - ⑤ Also physical and mental abilities can be weakened.
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-

Part D

Structure and

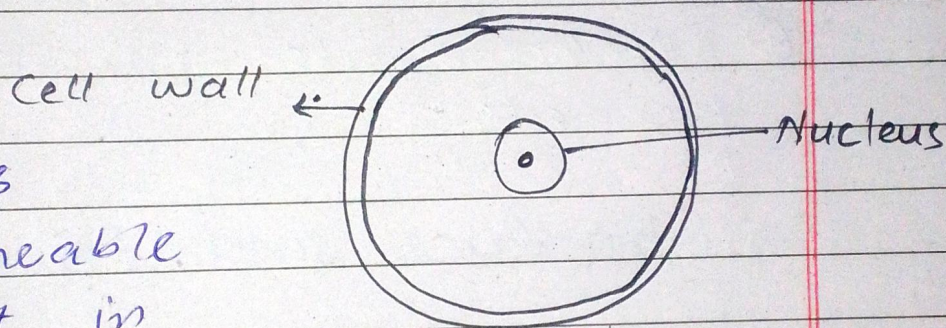
Functions of Cell Wall

Cell wall is protective outer layer of cell. It supports the structure of cell as a whole.

Properties and Functions

It is

- ① Permeable
- ② Rigid in structure
- ③ Present in plant cell
- ④ Bacteria is example of it
- ⑤ It is non-living being



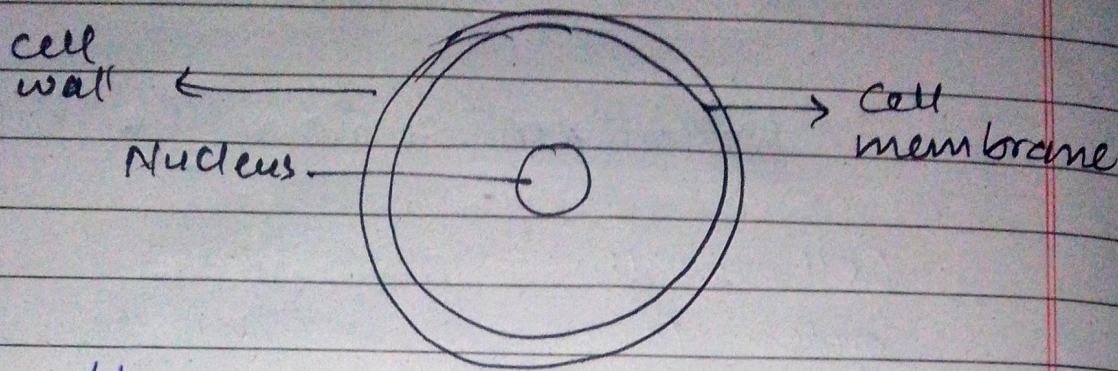
Structure and Functions

OF Cell membrane

Cell membrane is permeable layer of cell which contains

Lipids and proteins!

Properties and Functions



It can do:

- ① Controls movement of substance
- ② Selective - permeable and doesn't allow flow of everything
- ③ Maintain internal balance
- ④ Protect internal contents of cell.

Structure and Functions of Cytoplasm

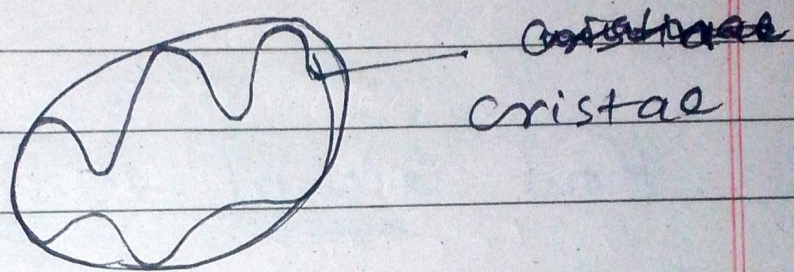
It is Jelly-like substance between cell membrane and nucleus.

Functions of Cytoplasm:

- Transportation within cell
- Site of most bio-chemical reactions.

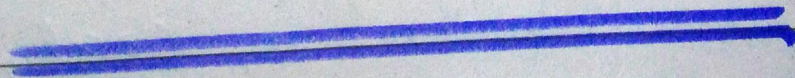
Mitochondria

It is energy powerhouse of cell. It contains proteins and capable of generating its own energy.



Functions of Mitochondria

- Generation of energy like ATP
- Cellular respiration
- Its inner layer is called Cristae
- Outer layer is smooth.



Question No 3

Global Warming

An average rise in the earth surface's temperature is global warming.

How Global Warming

can be reversed?

- ① - Afforestation and Reforestation
 - ② - Reducing number of vehicles with older engines
 - ③ - Carbon-taxing on big, consumption of coal, industries.
 - ④ - Development of sustainable urbanization
 - ⑤ - Awareness to youth and campaigns regarding its threats.
 - ⑥ - Meeting SDGs of UN.
-

Part B

Ceramics

Non-metallic and inorganic materials of clay hardened at high temperature is called Ceramics.

Properties of Ceramics

Ceramics shows following properties:

- 1 - Hard and Brittle
- 2 - Contains pure oxides and carbides
- 3 - Resistant to corrosion

Applications of Ceramics:

Commercial use of Ceramics:

- ① - Bath Tub and Sinks, ^{tiles} etc

Electrical uses of Ceramics

- ② Watch, Capacitor, Laptops

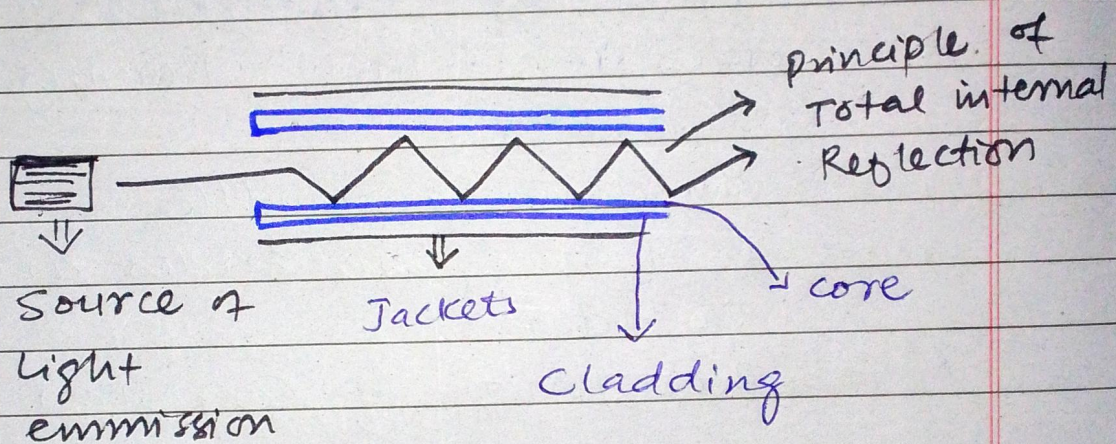
Industrial uses of Ceramics

- Use in engines of vehicles
- Drilling & cutting tools

Part C

Fiber Optics

Fiber optics is a medium of transferring data through light signals under the principle of total internal reflection.



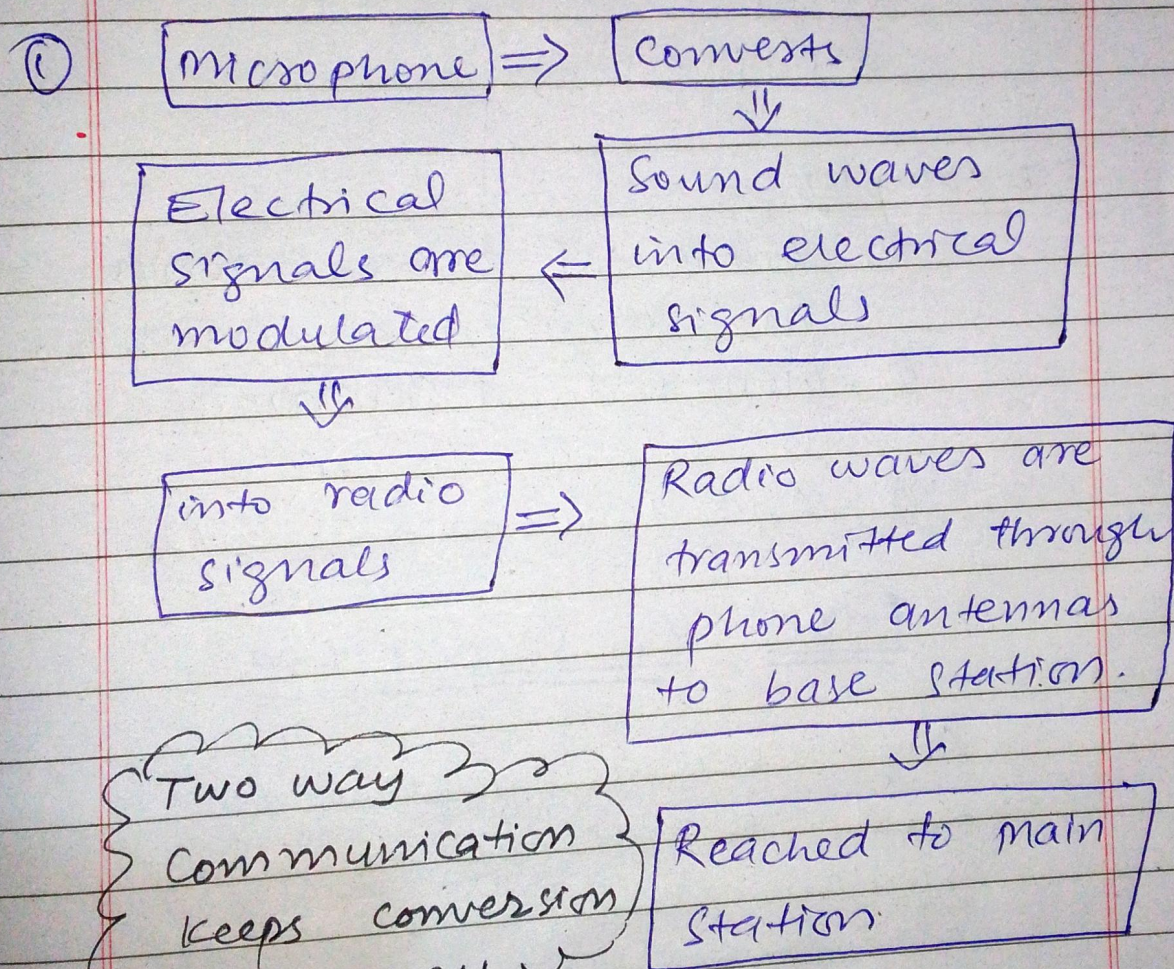
Working Principles:

- ① Light emitted from source and strikes core
- ② Angle at core greater than cladding's, making it reflect back rather than letting it escape
- ③ This continuous reflection allows it to cover long distance.

Mobile Phone

"mobile phone is portable communication device that transmits signals."

Working Principles:



Part D

Food Additives

Any substance added to food to improve or enhance its nutritional value is called Food additives

Examples

- ① Artificial color agents in Biryani or desserts.
- ② Mono sodium Glutamate as coloring agent
- ③ Aspartame in desserts.

Food Preservative

Any substance added to food to prevent it from spoiling and store it for longer period of time.

Examples

- ✓ Salt and Vinegar
- ✓ Sodium benzoate

Food Adulteration

The practice of adding inferior or cheap quality elements to food.

Purposes

- Bridge demand-supply gap.
- Earn more profit

Example

- Water in milk
- Clark powder in sugar

Food Contamination

A process of making food unsafe due to addition of microorganisms or chemicals.

Examples

- Raw oil and Food
- Pesticides in vegetables

Part D of Question 7

① Rashid speed = 32 pages in 6 hours

② Kamran speed = 40 pages in 5 hours

$$\textcircled{1} \frac{32}{6} \Rightarrow \frac{16}{3} \text{ pages/hour}$$

$$\textcircled{2} \frac{40}{5} \Rightarrow 8 \text{ pages/hour}$$

Combined speed.

$$\frac{16}{3} + 8 \Rightarrow \frac{16}{3} + \frac{24}{3} \Rightarrow \frac{40}{3}$$

DATE: _____

M T W T F S

$$\frac{110}{40 \times 3} \Rightarrow \frac{110 \times 3}{40} \Rightarrow \frac{330}{40} = 8.25$$

$$\Rightarrow 8 \text{ hours} + 0.25 \times 60 \Rightarrow 15$$

$$\Rightarrow 8 \text{ hours } 15 \text{ minutes}$$

Part C Question 7

Son present age $\Rightarrow x$ years

Father present age $\Rightarrow x + 24$

After two years $\Rightarrow S = x + 2$

$$F = x + 26$$

$$F = 2(x + 2)$$

$$x + 26 = 2x + 4$$

$$22 = x$$

$$\therefore 2x - x = x$$

side change to
avoid minus
sign.

Part B Question 7

Cost of 1 ball = x

4 4 17 " = 17x

Loss of price of 5 balls = $5x$

Selling 17 balls = 720/-

$$\text{Loss} = \text{CP} - \text{SP}$$

$$5x = 17x - 720$$

$$12x = 720$$

$$x = 60$$

One ball CP = Rs. 60

Part A Question 7

$$\cancel{400} \quad \frac{40}{100} x = \frac{2}{5} x$$

$$\frac{2}{3} y = \frac{2}{5} x \Rightarrow x \frac{1}{5} = \frac{1}{3} y$$

$$\frac{5x}{y} = 3y$$

∴ Bring y under
x and it
will be

$$\Rightarrow \frac{x}{y} \Rightarrow \frac{x}{y} = \frac{5}{3}$$