

Part - II

Q:2

Structure of Universe

And Big Bang Theory

Origin and Structure of Earth

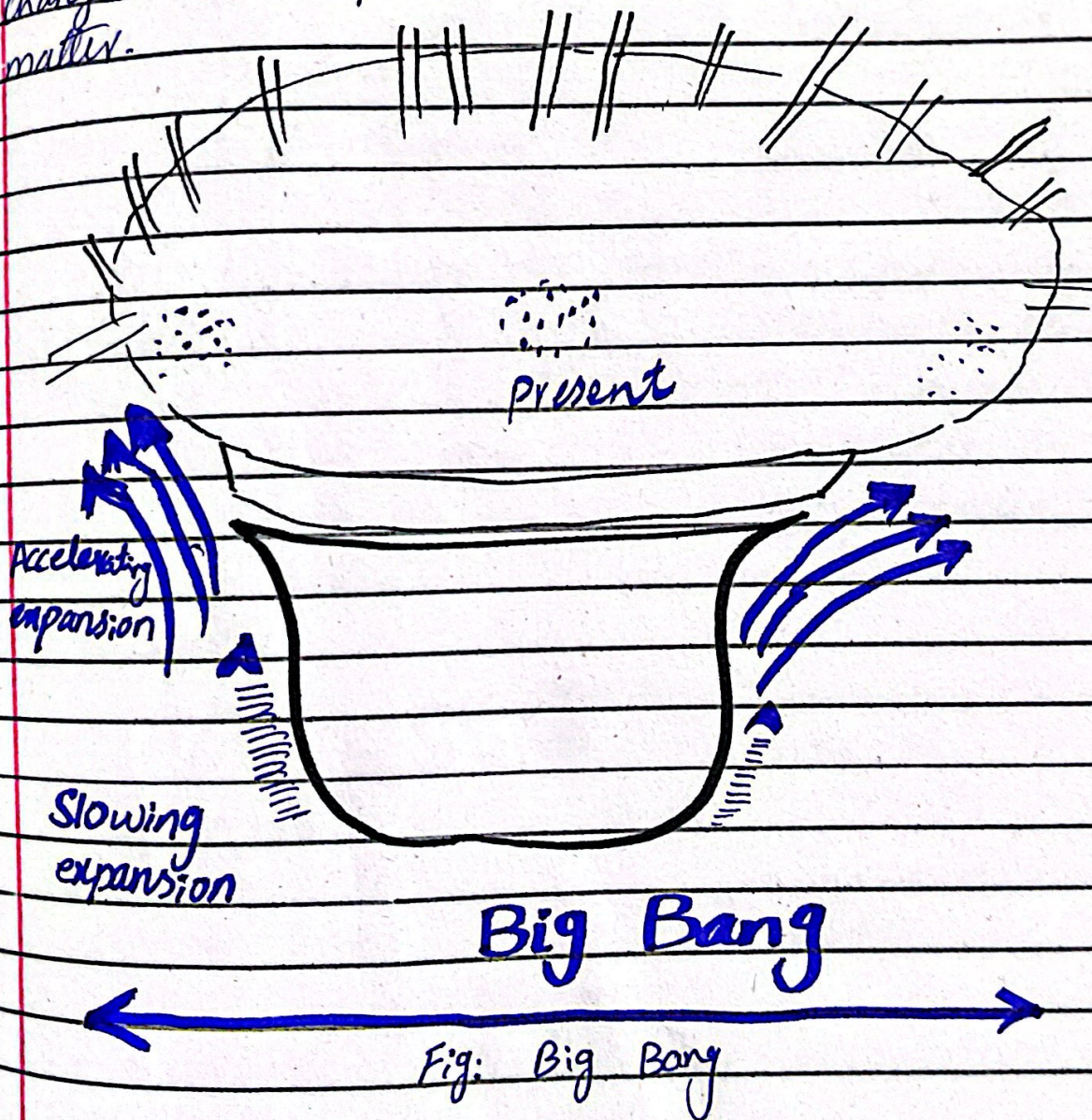
The problem of the origin of the universe is a bit like the old question: what came first the chicken or the egg? In other words, what agency created the universe? And what created that agency? Or perhaps, the universe, or the agency that created it existed forever, and did not need to ~~be~~ be created.

~ (Stephen Hawking)

Big Bang Theory

Most astronomers claimed the universe began about 13.7 years ago in a big bang. At that time, universe was inside a bubble that was thousand of times smaller than a pinhead and it was named as "Singularity".

It was hotter and denser than anything we can imagine. Then it suddenly exploded and universe began. Time, Space and matter all began with big bang. Then in a fraction of time's second, the universe started to grow and still expanding. As universe expanded and cooled, energy changed into particles of matter and anti-matter.



is theories on a static universe, which is what was originally predicted by Einstein is theory of general relativity.

b) Urinary System and explain the working of nephron

Urinary System

It is a system responsible for the removing metabolic wastes, maintaining water and electrolyte balance, and regulating blood pH and blood pressure. It consists of kidneys, ureters, urinary bladder and urethra.

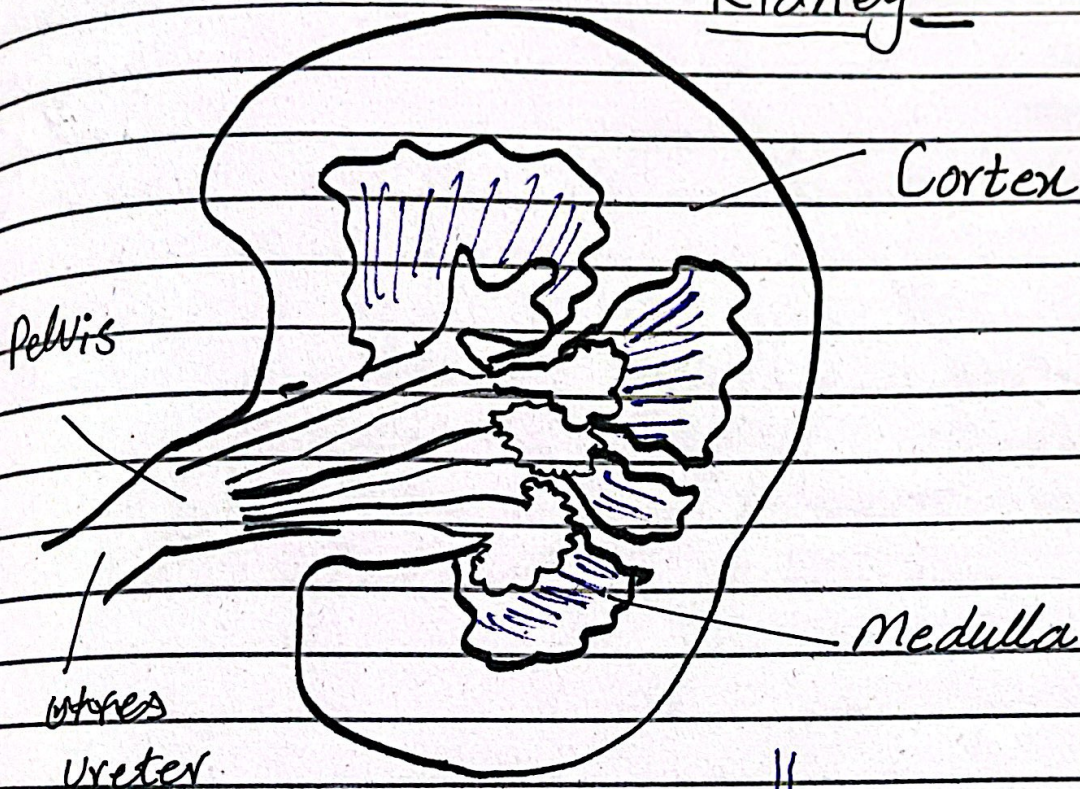
Working of Nephron

Nephron is structural unit of the kidney playing an important in filtration of blood and forming urine.

Human
of nephrons.

Nephrons Structure

Kidney



Ureter

Bowman's capsule

Nephron

Proximal tubule

Loop of henle

Thin descending limb

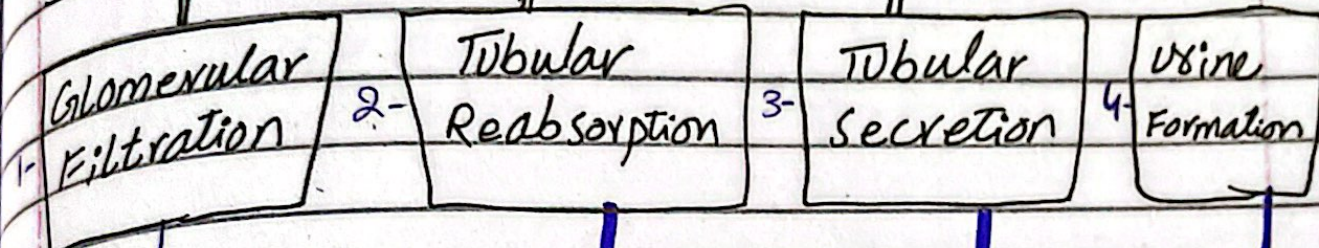
Distal convoluted tubule

connecting tubule

ascending limb



Working



Blood enters through afferent arteriole into glomerulus, a network of capillaries. Due to high BP, water, salt, filtered and while blood cells remain in.

Filtered fluid passes into proximal convoluted tubule (PCT) where the useful substances such as glucose, amino acids, salts are reabsorbable in blood.

Distal convoluted tubule (DCT) extra ions, drugs and toxic substances are actively secrete from blood to tubule.

Remaining fluid passes into collecting duct, where more water may reabsorb depending on body's needs. Finally urine form.

X — X

c) Un-balanced Diet

Unbalanced diet is a diet that does not provide nutrients like carbohydrates, proteins, fats, vitamins, minerals and water in a proper amounts and proportions required by body for normal growth, energy and maintenance.

Effects on healthy Living

1- Weak Immune System

2- Poor Growth and development

3- Energy Deficiency and Fatigue

4- Deficiency Diseases

5- obesity

6- Poor Mental Health

1- Lack of essential vitamins (A, C, iron) causes the weakness of immune system and risk of increase in infections and diseases.

2- Deficiency of Proteins and calories in children lead to stunted growth, delayed development and muscle wasting.

3- Lack of proper intake of carbohydrates and iron cause constant tiredness, weakness and low concentration that can affect the daily live activities.

4- un-balanced diet can cause sickness, sunny anemia and night blindness.

5- Excessive intake of sugar, fats and junk food leads to obesity and increase the risk of diabetes, high blood pressure, and Heart diseases.

6- Deficiency of essential nutrients affects brain function, leading to stress, irritability, depression and poor memory.

X — X

d) - i-Cell wall

Cell wall is present in plant cells, mainly made of cellulose and freely permeable, gives a fixed shape to cell. It protects the cell from mechanical injury.

ii) - Cell Membrane

Cell membrane is a thin, flexible, living membrane present in all cells. It is the selectively permeable, that controls the entry and exit of substances. It also maintains internal environment and allows cell communication and protects cell contents as well.

iii) Cytoplasm

It is a fluid filled region like jelly present between nucleus and cell membrane. It mainly compose of water, enzymes, proteins and salts.

iv, Mitochondria

It is known as the power house of the cell and produces (ATP) energy.

It helps in metabolic activities like fatty acid breakdown.

x — x

Q3: Global Warming

Global warming is a rise in temperature. Global warming can not be reversed ~~be~~ instantly, but some measures can cause to slow down the process. Global warming has proven destructive as it causes floods, pollution and biodiversity loss along with economic loss.

Measures to Implement

1- Reduction of Green house gas emission

2- transition to Renewable Energy

3- Afforestation

4- Carbon capture and Storage

5- Sustainable Agriculture

Greenhouse gases are significantly raising global warming. There is need to shift from fossil fuels to renewable energy. Improve energy efficiency in industries, buildings and transport.

2- Renewable energy sources produce very little or no greenhouse gases. There is need to adopt solar and wind power, phasing out coal based power plants and should invest in clean energy technologies.

3- Plantation is an important source to reduce global warming. There should prevent deforestation, and to increase afforestation.

4- Agriculture can also be proven an helpful factor to reduce the global warming. Should promote climate smart agriculture.

5- Advance technologies can remove the carbon ~~sink~~ and dioxide (CO_2) directly from atmosphere. So there should direct air capture system.

X — X

b) Ceramics

Ceramics are in-organic, non metallic and materials made by shaping and then hardening natural or synthetic compounds at high temperatures. They are usually hard, ~~brittle~~ brittle and heat resistant materials.

Properties of Ceramics

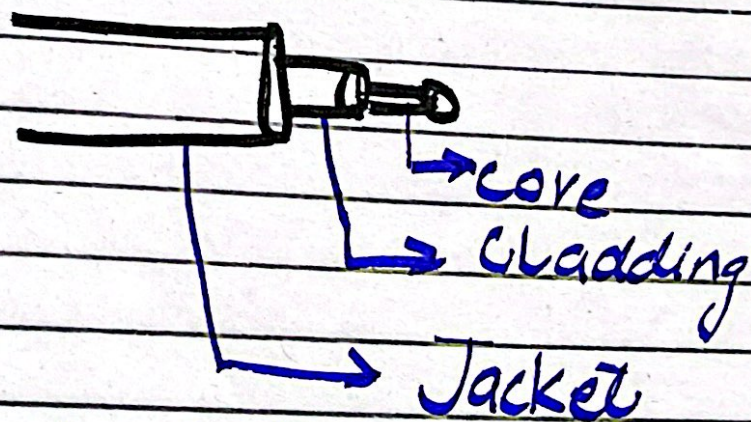
- 1- High Hardness: Ceramics are very hard and resistant to wear and abrasion.
- 2- Brittleness: They are very brittle and can break or crack under sudden impacts.
- 3- High Melting point: Ceramics can stand with very high temperatures without melting.
- 4- Low Electrical Conductivity: most ceramics are good electrical insulator.
- 5- Low Thermal conductivity: - It

generally do not conduct heat easily making them good ~~conductor~~ Thermal insulator

c) Fiber Optics

Fiber optics is thin strand of glass or plastic used to transmit data in form of lights signals, over long distance.

Structure of Fiber Optics



1- Core :-

central part through which light travels

2- Cladding :-

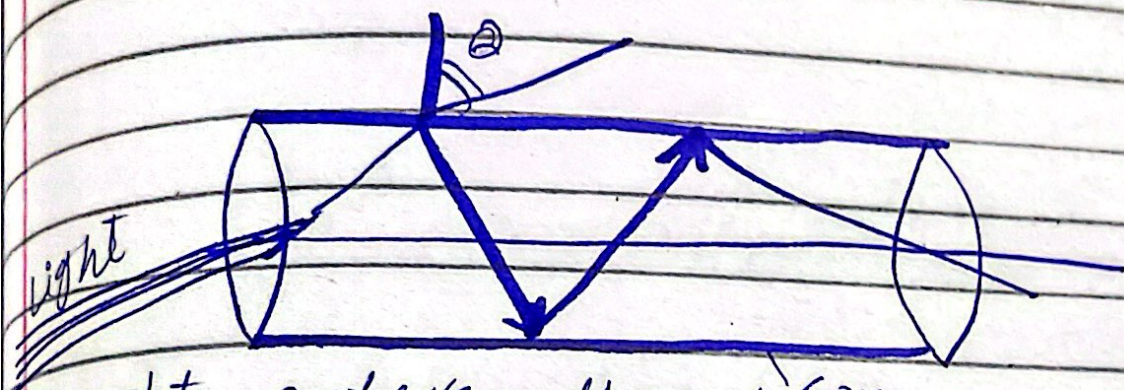
Surrounded layer

3- Jacket :-

Outer layer for protection

Working/Functions of Fiber Optics

working principle of fiber optics is total internal reflection



Light enters through core.

→ Due to high refractive index, light reflects continuously through within core.

→ These reflection allows light to travel long distances with minimum loss.

→ At receiving end, light signals are converted back to the electrical signals.

ii) Mobile Phone

A wireless communication device used to send and receive voice, text and data by using radio waves.

Working of Mobile

Its working principle is using the cellular communication system.

Phone converts voice into electrical signals. These signals converted radio waves into back, sound, waves.

During movement, the call is transferred automatically.

X — X

d) Define following

1- Food Additives:- Substances added to food intentionally to increase the taste, color texture and flavor. For example: Food colors

2- Food Preservatives:- chemicals or natural substances added to food to prevent spoilage by microorganisms like Sugar to preserve Jams, salt in pickles and meat

3- Food Adulteration:- intentionally adding harmful or unnecessary substance to food to increase profit or quantity. For example water mixing in Milk.

4- Food Contamination:- It occurs

when food becomes unsafe due to the accidental presence of harmful substances such as bacteria, chemicals. For example dust or insects falling into uncovered food.

X — X

(B)

Q6:A:

Women — ~~the~~ mother of Ahsan
 Granddaughter of women = daughter of Ahsan's brother
 Women in photograph = niece of Ahsan.

So,

Women is ~~where~~ Mother of Ahsan.

X — X

Q6:B

Ratio of length & = 3:2
 Breadth

Speed = 12 km/hr

Time = 8 minutes

$\frac{8}{60} = \frac{2}{15}$ hours

So

Distance covered in

1 minute round = Distance =

Speed $\times$ Time = $12 \times \frac{2}{15} = \frac{24 \times 2}{15} = \frac{48}{15} = \frac{16}{5}$

$$\text{in meters} = \frac{8}{5} \times 1000^{200}$$

$$= 1600 \text{ m.}$$

$$\text{Length \& breadth} = 3x : 2x$$

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

$$2(3x + 2x)$$

$$2(5x)$$

$$= 10x$$

$$10x = 1600$$

$$x = \frac{1600}{10} = 160$$

$$\text{Area} = (3x)(2x) = 6x^2$$

$$= 6(160)^2$$

$$= 6(25600)$$

$$= 153600 \text{ m}^2$$

✓ ——— ✓

∴ c):

sol

let 10's digit = x

unit's digit = $x+2$

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

$$= 11x + 2$$

$$\text{Sum of digits} = x + x+2 = 2x+2$$

$$= 2(n+1)$$

$$\text{Product} = (11n+2) \cdot 2(n+1) = 144$$

$$\frac{(11n+2) \times (2n+2)}{2} = 144$$

$$(11n+2)(n+1) = \frac{144}{2}$$

$$(11n+2)(n+1) = 72$$

$$\bullet \bullet \bullet 2(22+2)(2+1) = 72$$

$$= 2(44)(3) = 72$$

$$= 72 = 72 \checkmark$$

Num =

$$\text{Tens} = 2, \quad \text{units} = 2+2=4$$

$$\boxed{\text{Num} = 24}$$

$$x \text{-----} x$$

Q:b d):

$$\text{LCM} = 48$$

$$\text{Ratio} = 2:3$$

$$\text{Let the Number} = 2n, 3n$$

$$\text{LCM of } 2n, 3n = 6n$$

$$6n = 48$$

$$n = \frac{48}{6} = 8$$

$$\boxed{n = 8}$$

$$2n = 16, \quad 3n = 24$$
$$2(8) = 16, \quad 3(8) = 24$$

$$\text{sum} = 16 + 24 = 40$$

$$= \boxed{40}$$

✗ — ✗