

Q No-2.

A- Describe the structure of Universe according to Big Bang Theory.

Answer

According to Big-Bang, the universe started as an infinitely hot, dense point singularity rapidly expanded and cooled 13.8 billion years. Initially, it was consisted of fundamental particles into atoms, stars, galaxies, by rapid inflation and expansion.

This process created space, time, matter and energy forming the basic elements of universe.

1- Inflation. A period of incredibly rapid, exponential expansion called inflation.

2- Primordial Soup

As it cooled, quarks formed protons and neutrons, then combined to create first light nuclei.

3- Cosmic Microwave Background (CMB) Approx. (380,000 years)

This event released light (photons) that had been trapped.

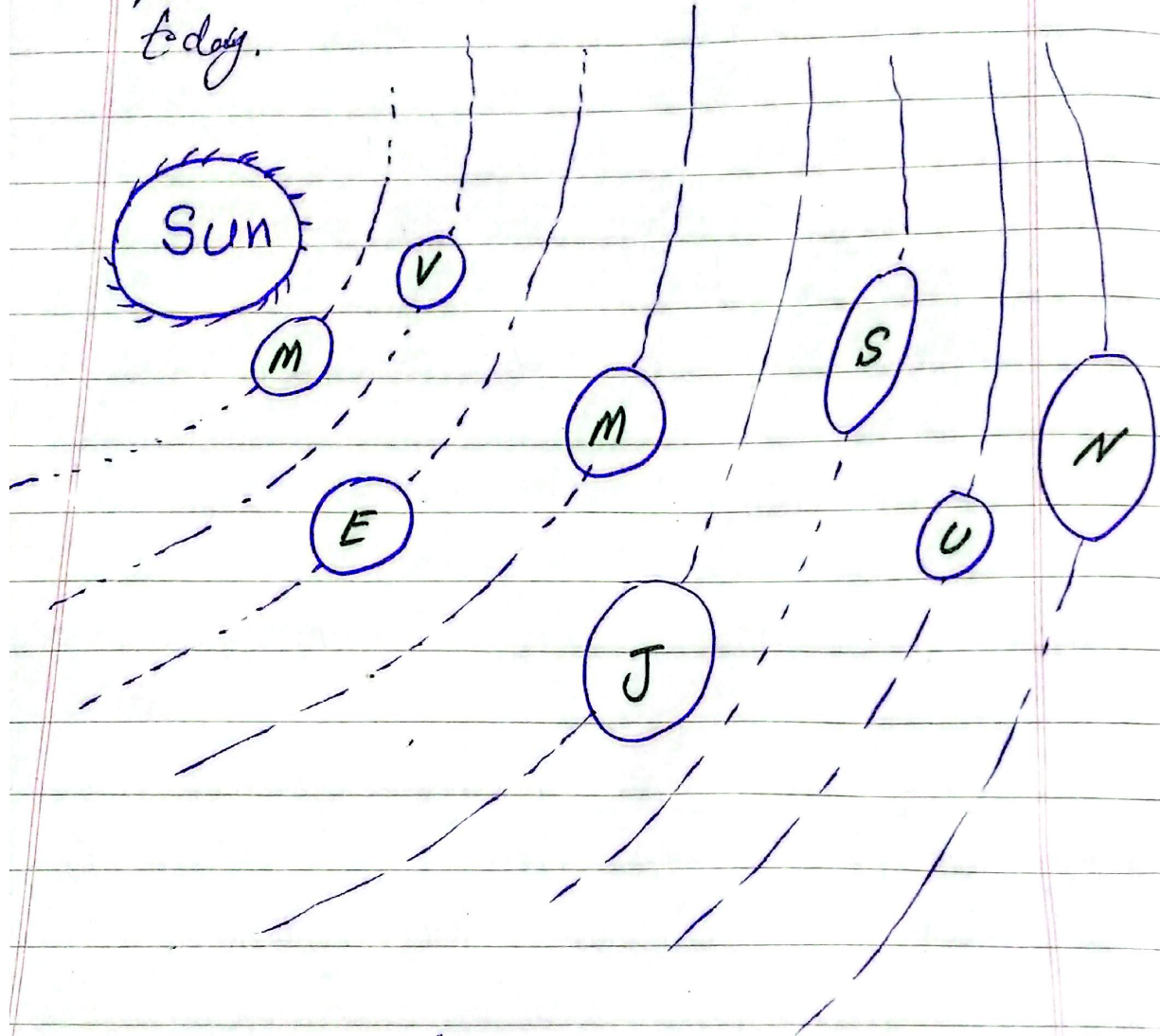
4- Cosmic Dark ages

In dark period there was no stars. After that gravity began pulling clouds of hydrogen and helium together to form stars and galaxies.

5- Formation of Galaxies

Stars fused lighter elements into heavier ones, seeding the universe for planets. Galaxies formed and clustered together due to

due to gravity. our solar system is in the Milky way. The expansion of the universe continues to today.

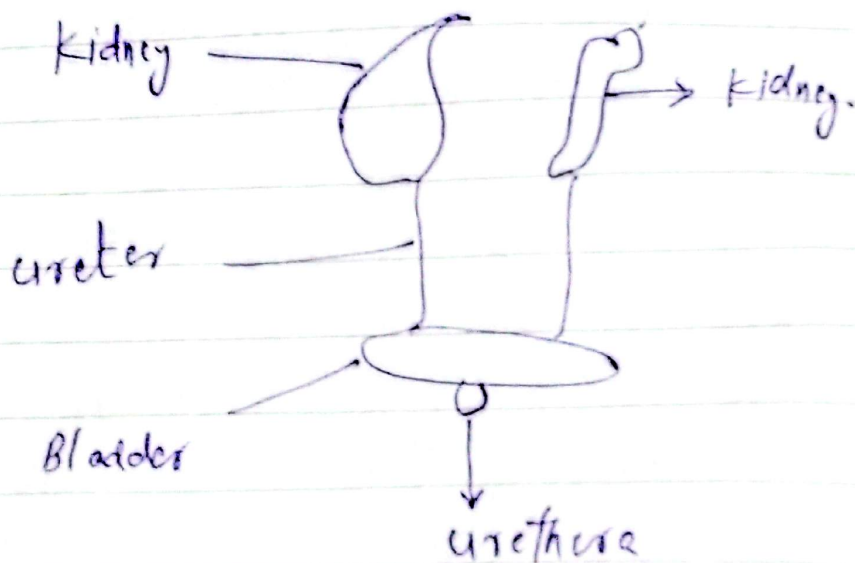


The structure of our solar system is one part of the whole universe.

B- Define Urinary System and explain the working of nephron.

Urinary System.

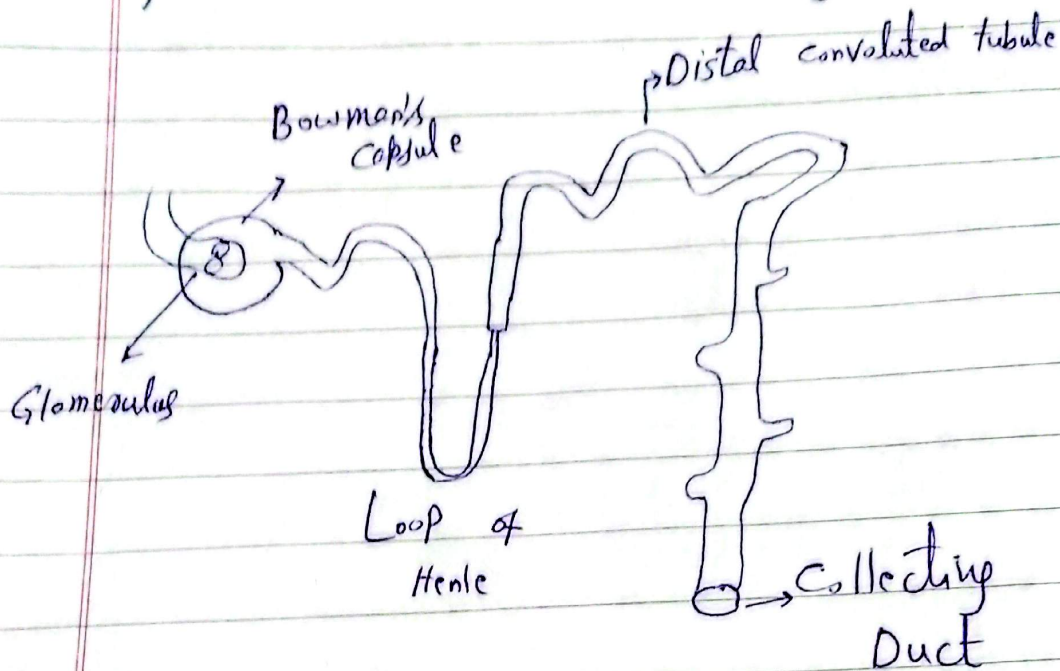
The organ system responsible for producing and excreting urine, which includes the kidneys, ureters, bladder and urethra.



The extra excretion of body through multiple organs come out of our human body. The whole system is called excretory system.

Nephron

The Nephron is the minute or microscopic structural and functional unit of kidney.



Functions of Nephron.

A nephron's main job is to filter blood, remove waste, and balance fluids and electrolytes to form urine. Filtration through kidney, Reabsorption and secretion and at the end excretion.

Q No-2

(C) What is unbalanced diet?
How it affects the healthy living?

Unbalanced Diet:

An unbalanced diet is one where you consistently eat too much or too little of essential nutrients like proteins, fats, carbs, vitamins, and minerals.

Characteristics of an unbalanced Diet

- 1- Nutritional Deficiencies
- 2- Excessive intake
- 3- Inadequate Calories
- 4- Monotonous Eating.

Common causes of unbalanced Diet

- 1- Poor food choices
- 2- Irregular patterns
- 3, Limited access

How unbalanced diet affects healthy living style.

An unhealthy diet significantly harms health by increasing risk for chronic diseases like heart diseases, stroke, type-2 diabetes, mental health issues on human life.

Major health impacts

- 1- Cardiovascular Diseases
- 2- Diabetes and obesity
- 3- Cancer
- 4- Mental Health problems
- 5- Gut Health
- 6- Brain Function
- 7- Nutritional Deficiencies

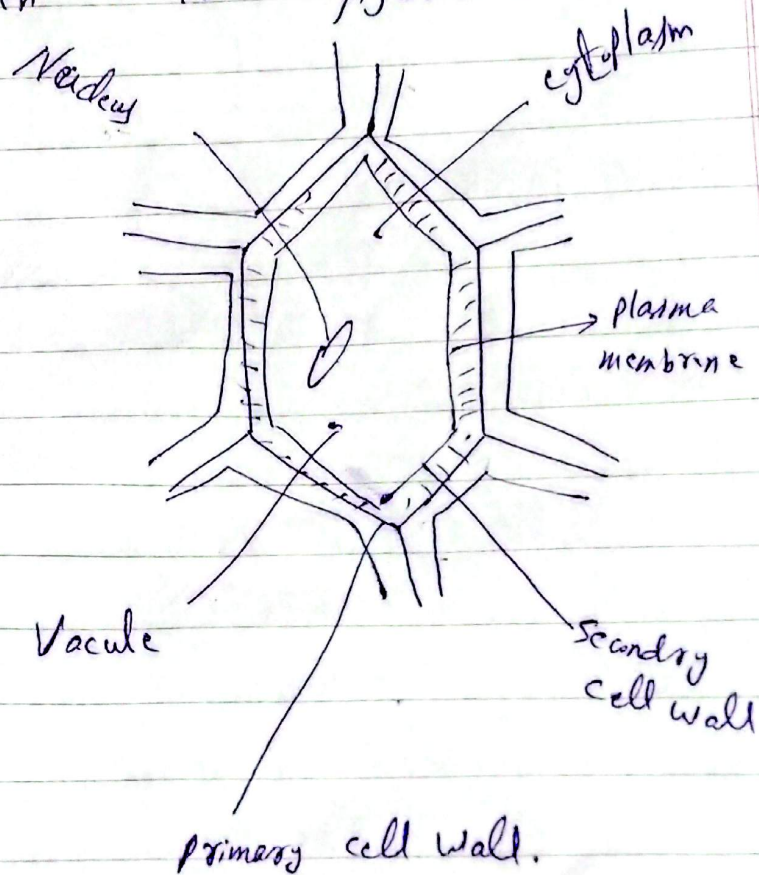
How to improve

- 1- Increase fruits, vegetables, nuts and whole grains.
- 2- Decrease salt, Sugar, unhealthy fats, Sugary drinks.
- 3- Choose unsaturated fats over saturated fats.

Cell wall

Structure of cell wall

A cell wall can be seen in figure.



Functions of cell wall

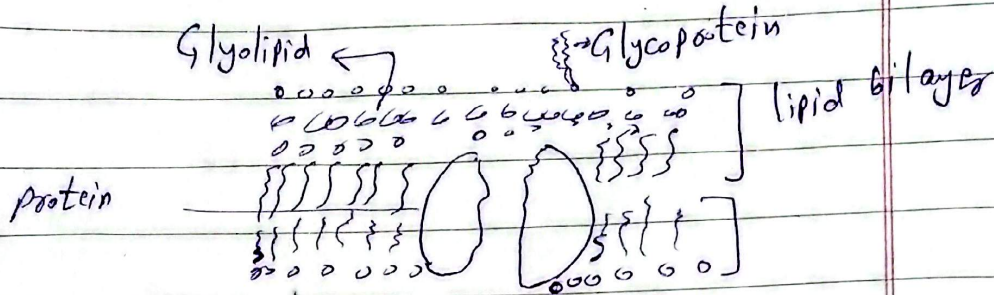
- 1- Structural support and shape.
- 2- protection
- 3- osmotic regulation
- 4- Nutrient Transport
- 5- Growth control.

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Cell Membrane.

Structure of cell membrane

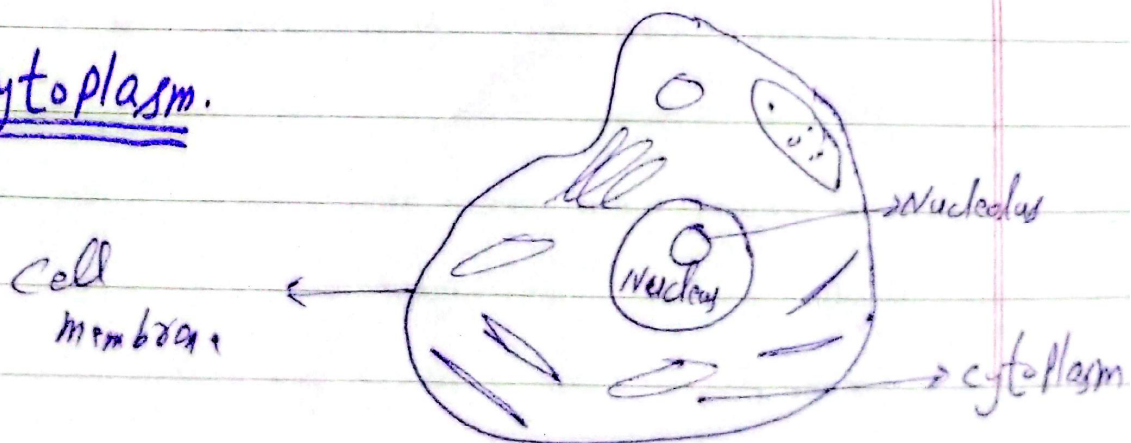


Cell membrane. All the membranes of cell. Similarly outer membrane of cell is called plasma membrane.

Functions of cell membrane

- i- Protection and barriers
- ii- Selective permeability
- iii- Cell communication
- iv- Structural support
- v- Active transportation of proteins.

Cytoplasm.



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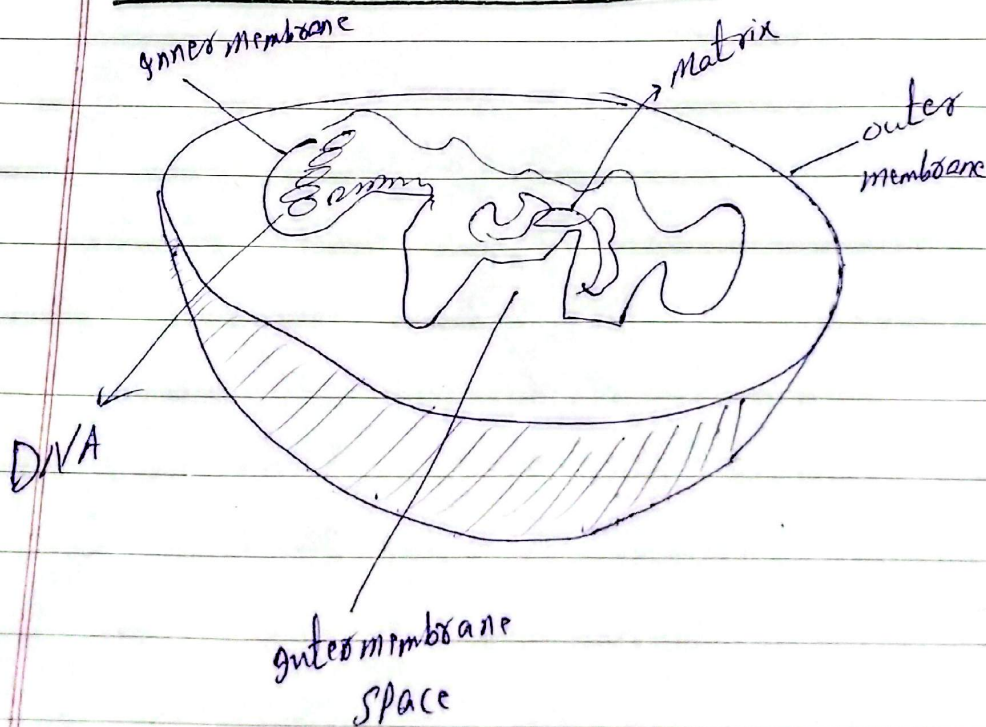
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Functions of cytoplasm

- 1 - Metabolic Hub
- 2 - Structural Support
- 3 - Transport Medium
- 4 - organelle Hosting
- 5 - cell Division
- 6 - Protection and Buffering.

Mitochondria

Mitochondria structure.



Mitochondria typically range from 0.5 to 1.0 micrometers in diameter.

Functions of Mitochondria

- 1- Energy conversion (ATP Synthesis)
- 2- Calcium Homeostasis
- 3- Programmed cell Death.
- 4- Heat Production
- 5- Metabolic Regulation.
- 6- Independent Replication.

Q No-3.

A- How Global warming can be reversed.

Answer

Global warming is a phenomenon which is affecting the globe in very bad way. Disasters like flood, Heat waves, rains are reaction of global warming. The temperature of earth is increasing day by day which ultimately affecting the world.

How Global warming can be reversed.

There are various means

which decrease the global warming. Some of these are given as under.

1- Planting Trees

Plantation of trees is one of the major solution to reverse global warming. A Kenyan Professor "Vengasi mathai" said "We can send a man to moon, why cannot we plant a tree".

2- Avoid Smoke

To decrease the air dust and smoke, global warming could be reversed.

3- Decreasing Carbon Emission

Decreasing the carbon emission is ultimately leads to the less global warming.

4- Changing the living standard

To change the living standard results into less global warming.

Q No-3 (B)

Ceramics.

Ceramics are inorganic non-metallic materials made from clay or earthen elements, shaped, and hardened by high-temperature firing.

Properties of Ceramics.

- 1 - Hardness and wear Resistance
- 2 - High Temperature Resistance
- 3 - Chemical stability.
- 4 - Electrical insulation
- 5 - Thermal insulation
- 6 - Brittleness
- 7 - Non magnetic

Applications of Ceramics

- 1 - Construction (like bricks)
- 2 - Kitchenware (pottery etc)
- 3 - Electronics (insulate substances)
- 4 - Biomedical (Dental implants etc)
- 5 - Industrial (cutting tools, abrasives).

Q No - 3 (C)Working of optic fibers

Optical fibers work by transmitting data as pulses of light through thin strands of glass or plastic, relying on the principle of Total internal reflection (TIR), where light bounces repeatedly off the inner walls and stays within the core allowing high-speed, long distance data transfer with minimal signal loss.

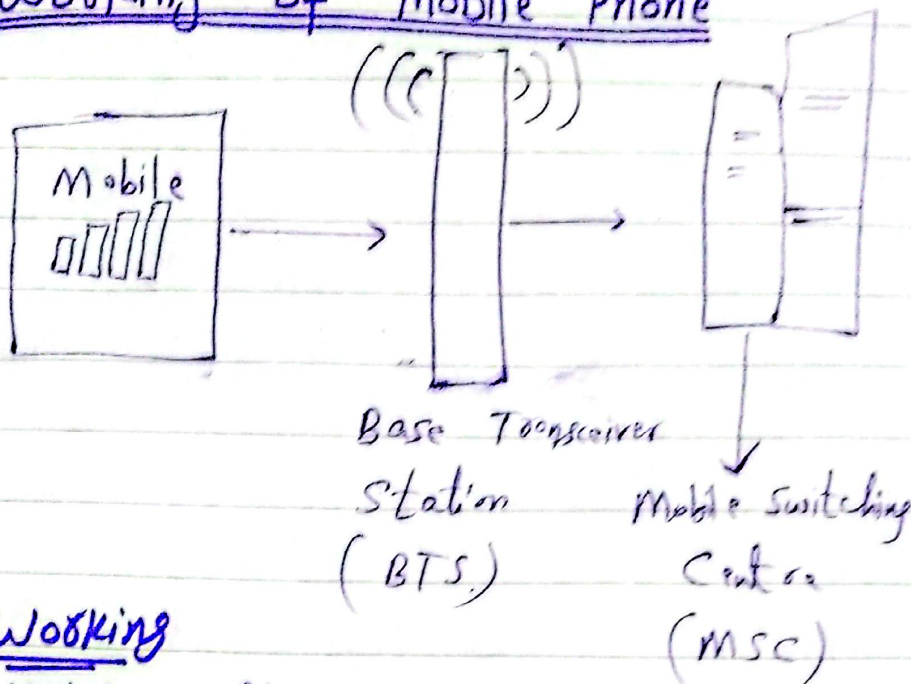
Key Components

- 1 - Core
- 2 - cladding
- 3 - Refractive index

How it Transmits data

- 1 - Signal conversion
- 2 - Light injection
- 3 - Bouncing
- 4 - Reception.

Working of Mobile Phone



Working

Mobile Phone works by converting your voice/data into digital signals, which are then transmitted as radio waves to near by cell tower, forming a cellular network that relays these signals across towers, to the recipient's phone, which reverses the process to play sound or display data, all managed by the network mobile switching center.

1- Food Additives

Food additives are substances added to food for technical purposes, like preserving, freshness, enhancing flavor, improving texture or boosting color.

Examples.

- 1- Preservatives (prevent spoilage by bacteria)
- 2- Colorings (Artificial dyes)
- 3- Flavor Enhancers (improve taste)
- 4- Sweeteners (sugar, sucralose)
- 5- Nutritional Additives (iodine in salt)

2- Food preservatives.

Food preservation is the process of treating food to slow spoilage, preventing microbial growth and oxidation to extend shelf life.

Examples.

- 1- Drying/Dehydration

- 2- Canning
- 3- Freezing
- 4- Salting / sugaring
- 5- Fermentation
- 6- Pickling
- 7- Chemical preservatives.

3- Food Adulteration

Food adulteration is the intentional practice of adding inferior, cheaper, or harmful substances to food to increase bulk, improve appearance or lower cost.

Examples.

- 1- Milk (adding water)
- 2- Spices (Chalk Powder for brightness)
- 3- Oil (Sunflower, Canola)
- 4- Grains/Pulses (stones, sand)
- 5- Honey (Diluting with sugar)
- 6- Meat (cheaper meat)
- 7- Tea (adding used tea leaf)

Food contamination.

Food contamination is the presence of harmful or unwanted substances in food, making it unsafe to eat and potentially causing illness, allergies or injury.

Examples.

- 1- Eating undercooked chicken contaminated with bacteria or viruses.
- 2- Toxic substances from cleaning products, pesticides or industrial waste.
- 3- Foreign objects introduced during processing or handling, ... finding piece of metal, plastic etc.
- 4- undeclared allergens (like nuts or gluten) in a product, considered contamination if not labeled.

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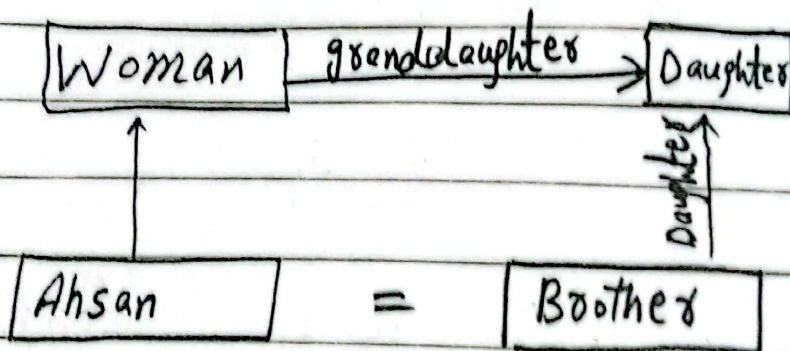
Q No-6

(A)

pointing to a woman, Ahsan said, Her granddaughter is the only daughter of my brother. How is the woman related to Ahsan.

Solution

It could be easily understood with the help of diagram.



i. Ahsan pointed towards a woman and said her granddaughter is the only daughter of my brother.

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ii- Granddaughters of Women
is only daughter of
Ahsan's brother mean Ahsan
is uncle of granddaughter.

iii- It means Women
is mother-in-law of
Ahsan's brother.

iv- Woman is mother-in-law
of Ahsan's brother.

v- Ahsan's brother has only
daughter.

Q No-6-B.

The ratio between length
and breadth of a
rectangular park = 3:2

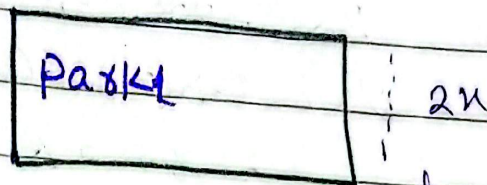
Time of one revolution
around rectangular park = 8 min

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Speed of cycle, that completed
one revolution = 12 km/hr

We know that



$$\text{----- } 3x \Rightarrow \text{ratio} = \frac{3}{2}$$

$$S = vt$$

$$S = 12 \text{ km/hr} \times 8 \text{ min}$$

$$= \frac{12 \times 1000 \text{ m}}{60 \text{ min}} \times 8 \text{ min}$$

$$S = 200 \text{ m}$$

Here perimeter = 200

Also

We know that

$$A = L \times W$$

$$L : B = 3 : 2$$

$$\Rightarrow \frac{L}{B} = \frac{3}{2}$$

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We know

$$\text{Perimeter} = L + L + W + W$$

$$\text{Here } L : W = 3 : 2$$

$$\text{So } 200 = 3x + 3x + 2x + 2x$$

$$200 = 3(20) + 3(20) + 2(20) + 2(20)$$

$$= 60 + 60 + 40 + 40$$

$$200 = 120 + 80$$

$$\Rightarrow 200 = 200$$

$$\text{Here } L = 60 \text{ m and}$$

$$W = 40 \text{ m}$$

$$\text{Area} = L \times W$$

$$= 60 \text{ m} \times 40 \text{ m}$$

$$= (60 \times 40) \text{ m}^2$$

$$= 2400 \text{ m}^2$$

Hence the required area of the park is 2400 m^2

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Q No-6-C

gn a two digit number
let the unit digit and
ten's digit as x and $x+2$.

ten digit number = x

by given condition

unit digit number = $x+2$

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

by given condition

$$(x+2)(x+(x+2)) = 144$$

$$\Rightarrow (x+2)(2x+2) = 144$$

$$\Rightarrow 2x^2 + 2x + 4x + 4 = 144$$

$$\Rightarrow 2x^2 + 6x + 4 = 144$$

$$\Rightarrow 2x^2 + 6x - 140 = 0$$

$$\Rightarrow x^2 + 3x - 70 = 0$$

$$\Rightarrow x^2 + 10x - 7x - 70 = 0$$

$$\Rightarrow x(x+10) - 7(x+10) = 0$$

$$\Rightarrow (x+10)(x-7) = 0$$

$$\Rightarrow x+10 = 0 \quad | \quad x-7 = 0$$

$$\Rightarrow \boxed{x = -10} \quad | \quad \boxed{x = 7}$$

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So there exists two possibilities

$$\text{ten digit number} = x = 7$$

$$\text{and } x = -10$$

$$\text{unit digit number} = x + 2 = 9$$

$$\text{and } = -10 + 2$$

$$= -8$$

Hence the required solution,

Q No-6-D.

The L.C.M of two numbers = 48.

The ratio of the numbers = 2:3

$$\text{let 1st number} = 2x$$

$$\text{" 2nd " } = 3x$$

Now The L.C.M = 48.

So by taking L.C.M

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$$\begin{array}{r|l} x & 2x - 3x \\ 2 & 2 - 3 \\ 3 & 1 - 3 \\ & 1 - 1 \end{array}$$

also $L.C.M = x \times 2 \times 3$

$$\Rightarrow 48 = x \times 2 \times 3$$

$$\Rightarrow 48 \div 6 = x$$

$$\Rightarrow \boxed{x = 8}$$

by putting value we get

$$\begin{aligned} \text{first number} &= 2 \times 8 \\ &= 16 \end{aligned}$$

$$\begin{aligned} \text{2nd number} &= 3 \times 8 \\ &= 24 \end{aligned}$$

By adding we get

$$\begin{aligned} \text{Sum of two numbers} &= 16 + 24 \\ &= 40 \end{aligned}$$

$\Rightarrow$ So the sum of the two numbers is 40

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Q No - 8

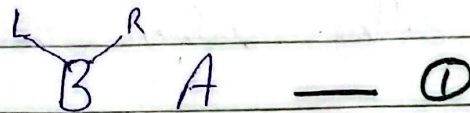
(A) (Solution)

There are five different houses

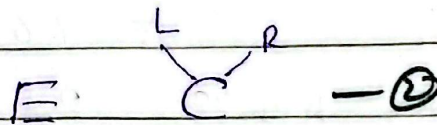
A, B, C, D and E

By the given condition.

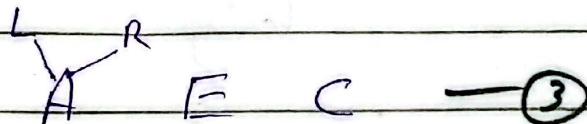
i- A is right of B



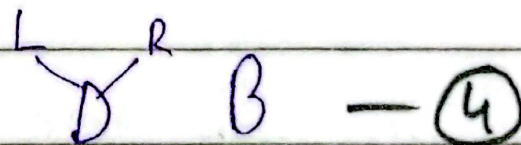
ii- E is left of C



and right of A



iii- B is to the right of D



From ①, ②, ③ and ④ we have

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By arranging according to
the condition we have

BA — (1)

EC — (2)

AEC — (3)

DB — (4)

⇒

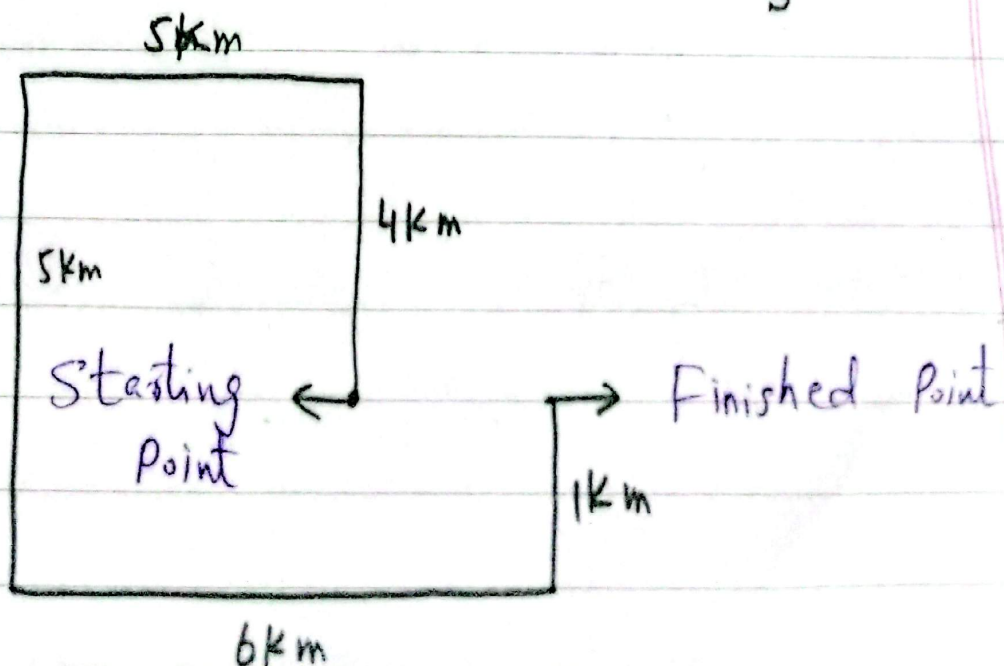
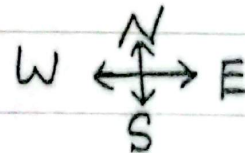
DBAEC

⇒ A is in the middle
of all the houses

Q No-8

(B)

According to the given
information
Imagine a figure



Day: _____

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Keeping in mind the previous figure.

i - How many km are you from the place you started?

Answer.

I am standing 1 km away from the starting point.

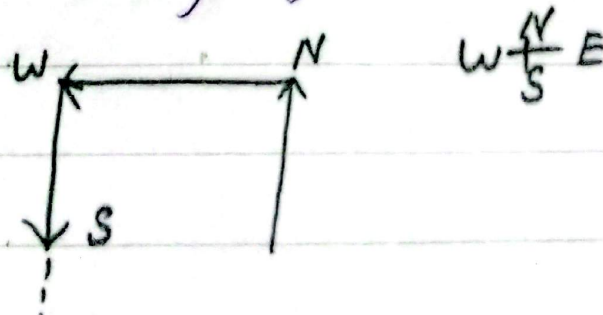
ii - In which direction will you be running while finishing.

Answer

The finishing direction is North.

iii - After taking the second turn, in which direction will you be running.

Answer After taking the second turn



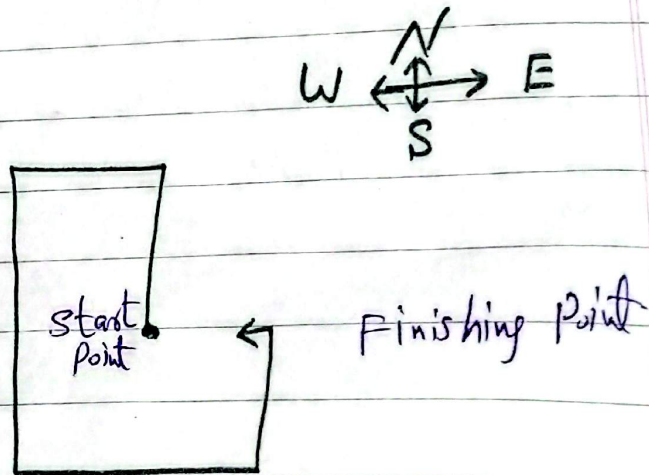
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After taking the second turn
the direction will be in
South.

iv - From the finishing point
if you have to reach the
point from where you started,
in which direction will you
have to run?

Answer



From the finishing point to-
wards the starting point
I have to run towards
West direction. After running
1 km I will reach at
the starting point.

Q No-8

(C) Find the odd man out in the following anagram.

(i) THRSI

The above anagram can be written as.

⇒ SHIRT

which is a wearing cloth.

(ii) AOTC

Above letters can be decoded as

⇒ COAT

which is also a wearing cloth.

(iii)

EOUBSL

⇒ odd ---

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(iv) KTRIS

Above letters can be
decoded as

⇒ SKIRT

Which is a wearing
cloth.

(v) RETAEWS

It can be decoded
as

⇒ SWEATER

Again belongs to the
wearing clothes family.

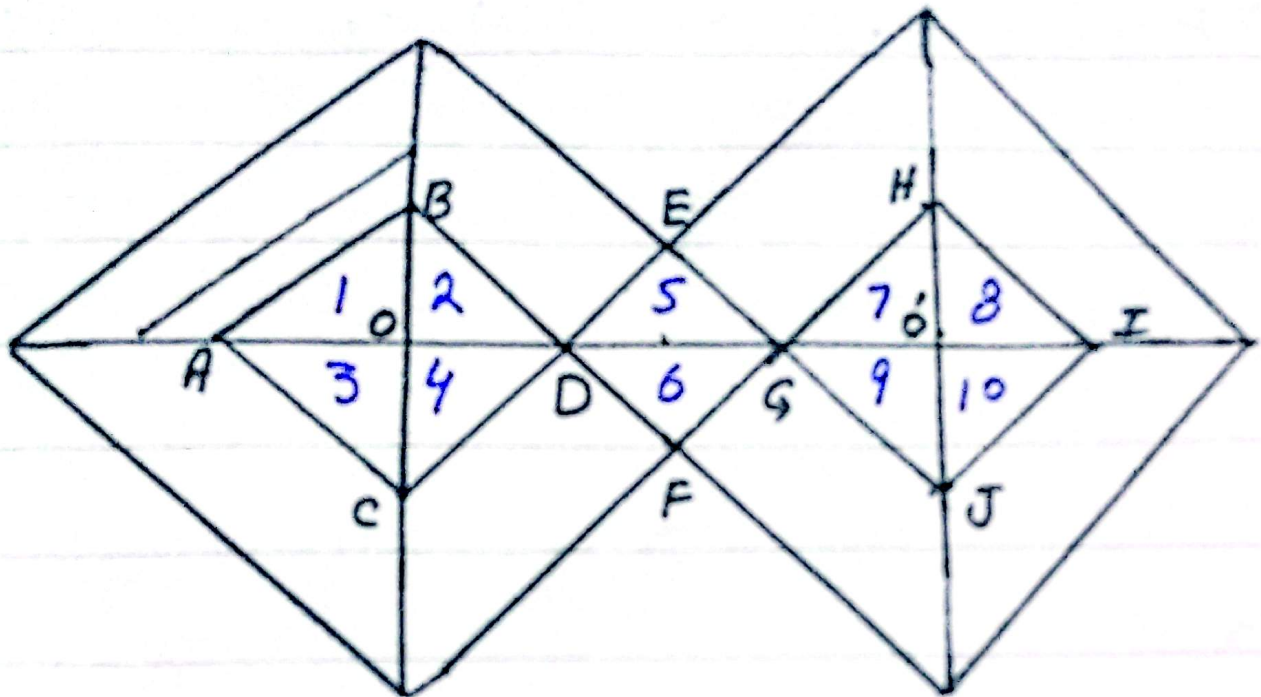
Hence, all the four anagrams
belong to the wearing family
except EOUBSL.

So the odd man out
in the anagram is

• EOUBSL •

Q No-8-(D)

Triangles in a given figure



In the given figure there are 10 triangles.

Triangle 1 = $\triangle AOB$

" 2 = $\triangle BOD$

" 3 = $\triangle AOC$

" 4 = $\triangle COD$

" 5 = $\triangle EDG$

" 6 = $\triangle DFG$

" 7 = $\triangle HOG$

" 8 = $\triangle HOI$

" 9 = $\triangle GOJ$

" 10 = $\triangle IOJ$

→ There are "10" possible triangles in a figure.