

DATE: \_\_\_\_\_

DAY: \_\_\_\_\_

Muhammad Arham

IB-066

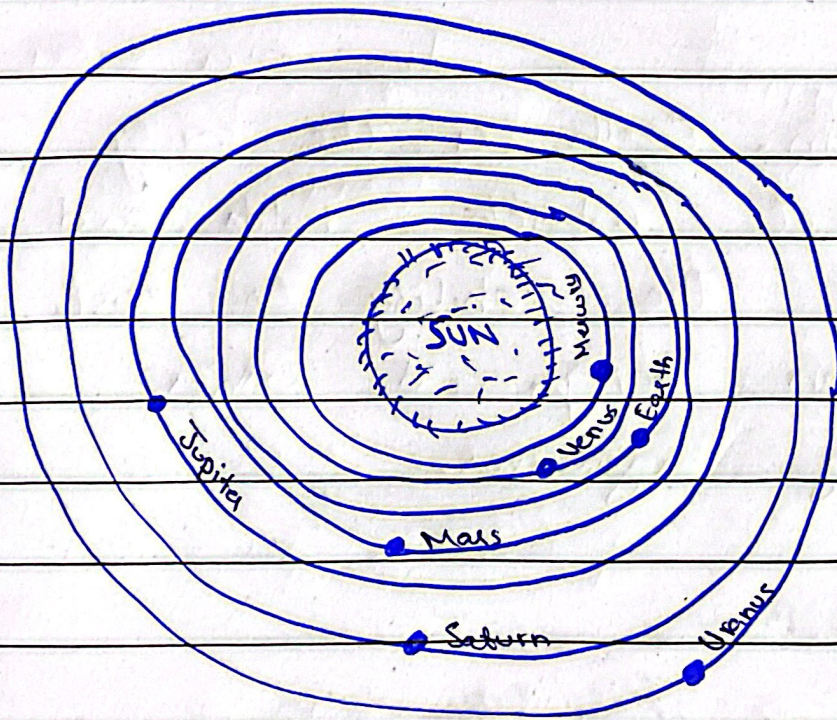
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## SECTION-A

QUESTION NO. 4

Part A

### SOLAR SYSTEM



Our solar system is a part of milky way galaxy and came into existence 4.6 billions years ago. In solar

system Sun is the largest body and holds 98.77% of the total mass of solar system. Similarly, it has nine planets (including pluto - a dwarf planet) which revolve around the sun.

### Existence of human life:

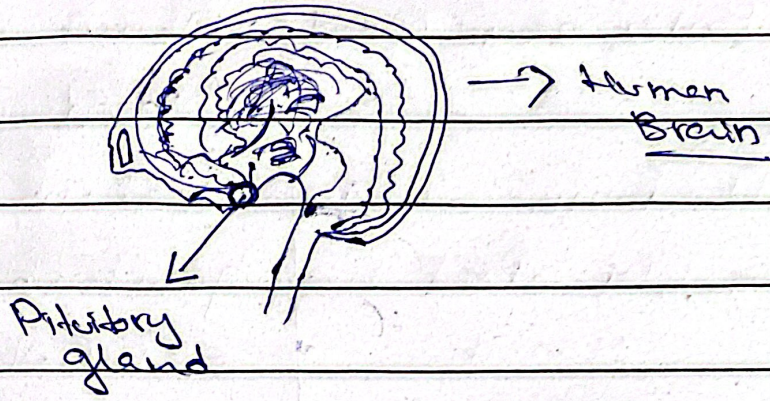
In our solar system, Earth is the only planet which holds and has the ability to exist human beings, and other living organisms.

### → Part B

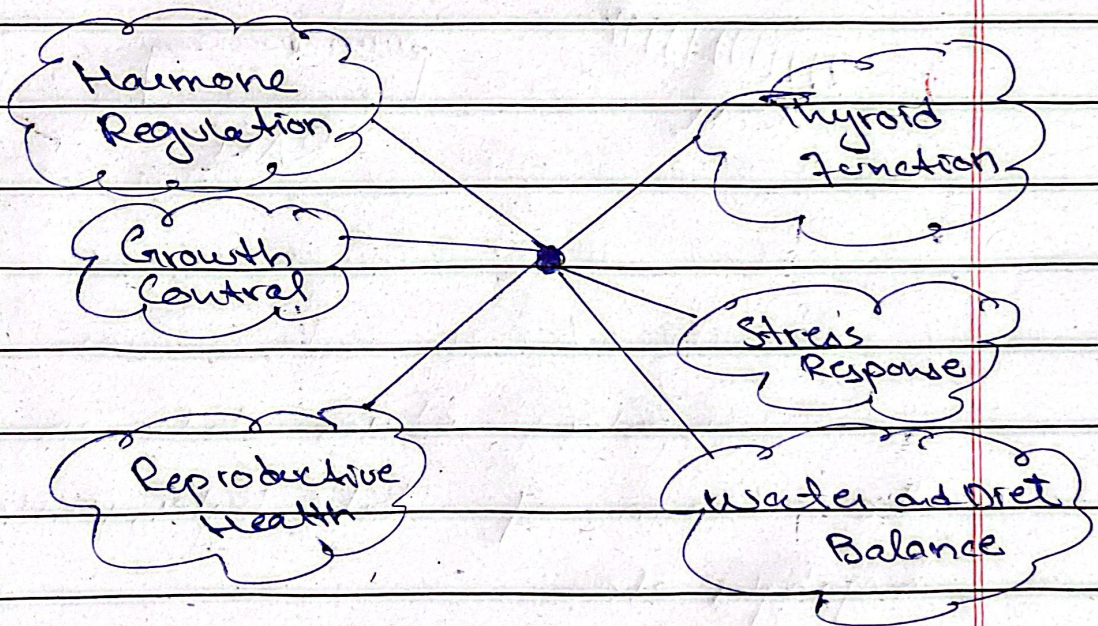
#### Pituitary gland

The pituitary gland also called the master gland, is an important gland in the human body. It regulates

The various functions by releasing hormones and controlling other glands.



→ Functions of Pituitary gland



→ Part C

Difference b/w RAM and ROM

RAM

ROM

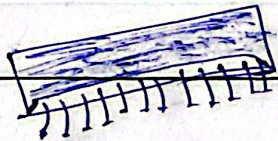
- Random Access Memory

Read only memory.

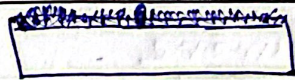
DATE: \_\_\_\_\_

DAY: \_\_\_\_\_

- |                                      |   |
|--------------------------------------|---|
| • Temporary used for processing data | • Permanent storage for essential data        |
| • Volatile                           | • Non-Volatile                                |
| • Faster access speed                | • Slower access speed                         |
| • Used in computers, mobiles etc.    | • Used in BIOS, firmware and embedded systems |
| • Expensive                          | • Comparatively cheap                         |



ROM



RAM

### → Nibble

Computer stores data in the form of bits, bytes, nibbles, megabytes etc.

→ The smallest unit is one bit

→ When 4 bits combine then they are called "1 nibble"

4 bits = 1 nibble

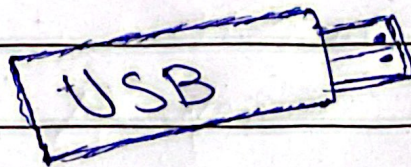
Similarly, 8 bits = 1 byte

DATE: \_\_\_\_\_

DAY: \_\_\_\_\_

1 byte = 2 nibbles.

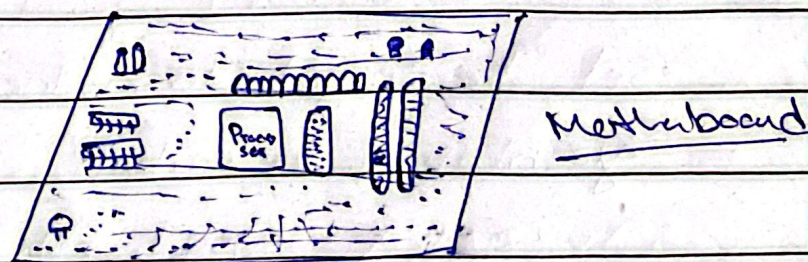
## → USB



USB is a secondary storage device, which is used to store and transfer data from one computer to the other.

- It comes in the storage capacities of usually gigabytes (GB's)
- It is a reliable and easy to use a carry device for the protection of data.

## → Motherboard



It is also called as the brain of the computer, due to

DATE: \_\_\_\_\_

DAY: \_\_\_\_\_

its responsibility to carry and handle all the operation inside the computer.

→ It consists of a silicon board which consists of transistors, processors, ram slots, CPU, GPU, logical units etc.

→ Part D

COP-29

In 2024, United Nations Climate Change Conference COP-29, held in Baku, Azerbaijan with the goal of reducing the average temperature of earth by 1.5°C.

→ Major Initiatives.

• Set the target to reduce the greenhouse or carbon emission.

• Increasing fund allocation for the safety of environment

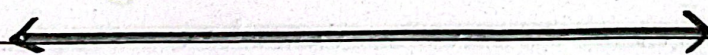
• Climate related commitments

by the world leaders.

## → Importance of COP-29

The year 2024 has been marked as the hottest year of this century. The average temperature has increased more than 1.5% from the previous 100 years.

To curb this, COP-29 has the potential to limit the carbon emission to reduce the average increase in temperature of the earth to save the ecosystem.



## QUESTION # 5

### Part A

#### Sea Surface Temperature Rise

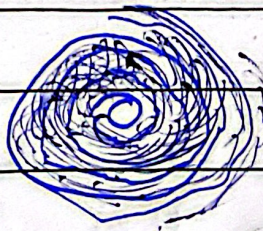
Sea surface temperature rise is the increase in the temperature of ocean's surface due to

DATE: \_\_\_\_\_

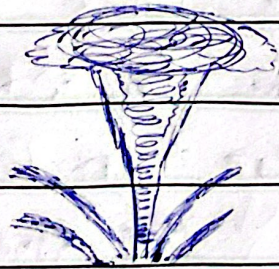
DAY: \_\_\_\_\_

to the factors such as climate change, global warming as because of human activities such as burning of fossil fuels.

2 → How it affects the formation of Tropical Cyclone



outer wall



Inner wall

→ Warm ocean water provides necessary heat and fuels the tropical cyclone to occur. As a result, the warm water rises and the cold water goes down, which also affects the temperature and participates.

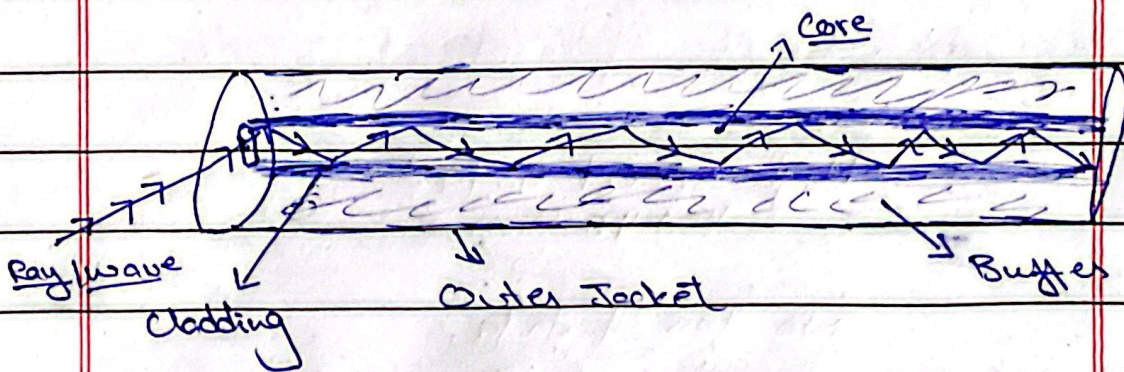


in forming the cyclone.

→ Lower atmospheric pressure allows the warm water heats to increase the speed and the low pressure system develops the cyclone.

→ Part B

### Optical Fiber



→ How fiber optical works

• Fiber optical wire is used for high transmission speed without any data loss. It

consist of a core made up of glass or plastic which reflects the wave with the <sup>original</sup> speed.

• Total Internal Reflection: light

Signals entering into core with a specific angle is reflected within the core and the cladding makes it sure that the angle of reflection may not be damaged or altered. Hence it results in faster speed and no data loss.

→ Advantages of Optical fiber.

High Speed data  
Transmission

No loss of data

Light weight

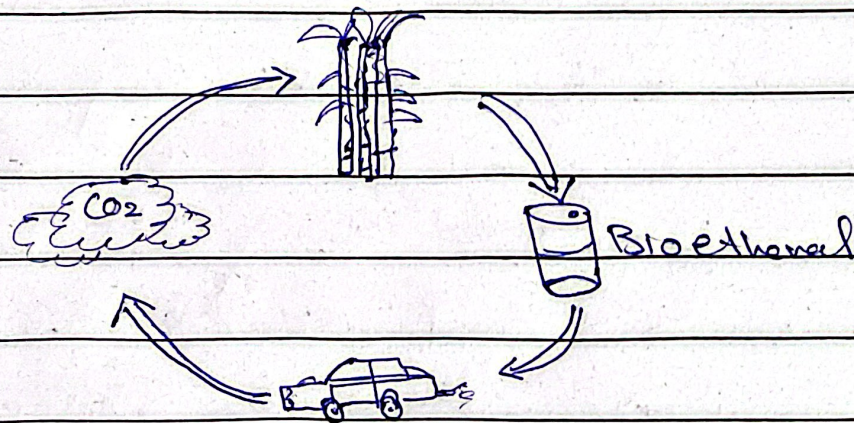
Easy to install

→ Part C

Micro-organisms play a crucial role in addressing the current fuel shortage by providing sustainable and eco-friendly

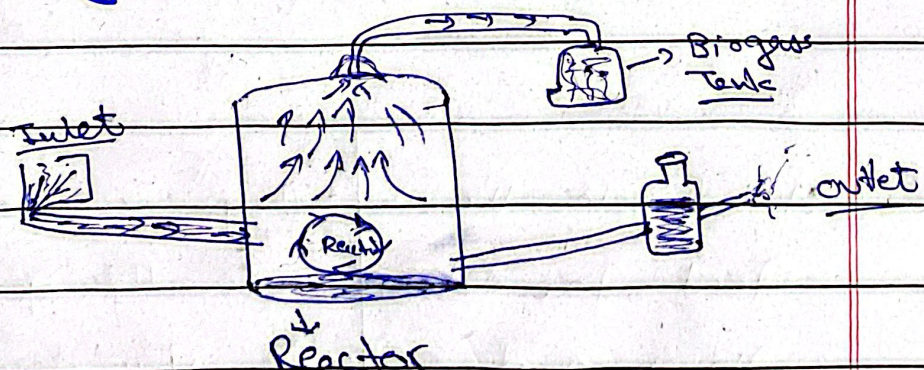
alternatives to the fossil fuels.

### → Bio fuel production



- Bioethanol is produced by fermenting sugar from crops which helps in automobiles as an alternative to the fossil fuels.

### → Biogas Generation



- Landfill waste is added to the reactor from the inlet chamber which takes reaction in reaction chamber. Chamber separates the

DATE: \_\_\_\_\_

DAY: \_\_\_\_\_

biogas in the other biogas tank and exits the waste gas from outlet chamber.

### → Advantages of Biofuels.

- Cheap
- Best Alternative to fossil fuels
- Less harmful effects to environment
- Easy production
- Reduces land waste

### → Part D

## Food Additives and Food Preservatives

### Additives

- Added into the food for color, flavor and taste or smell

### Preservatives

- They are added into the food to slow down the <sup>bacterial</sup> reaction inside the food and to increase the life span of food

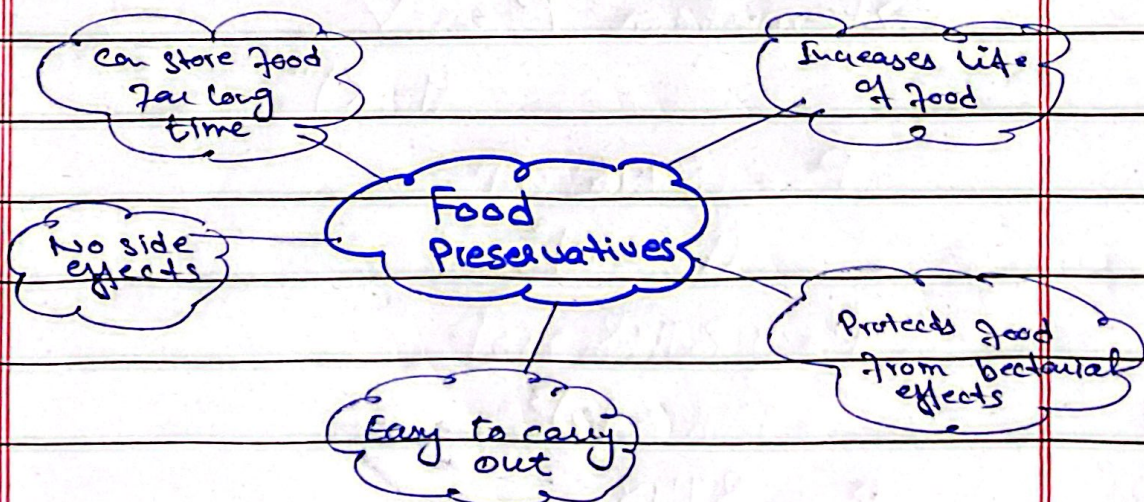
## Food Additives

- Natural: Salt, Vinegar, Herbs, Spices etc
- Artificial: Nitrates, Trans fats, Sodium benzoate, Potassium, artificial flavors, artificial colors, Sorbate etc.

## Food Preservatives

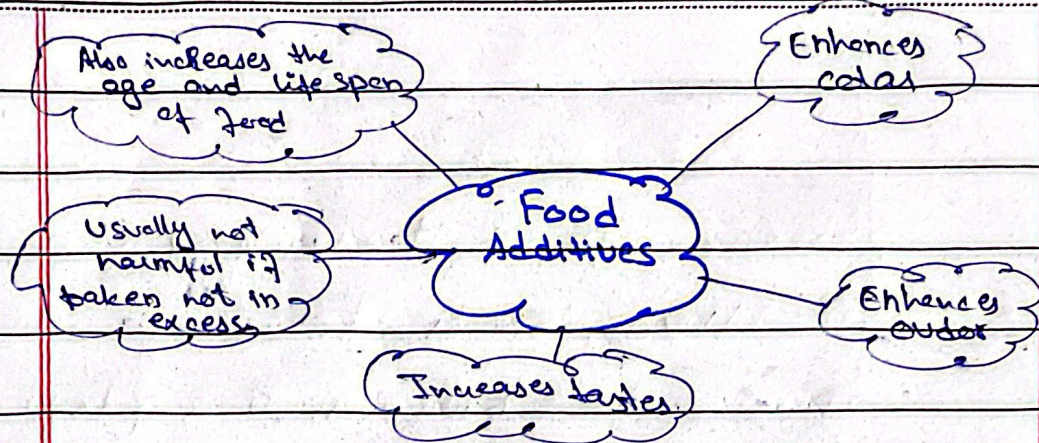
- Natural: Salt, Sugar, natural vinegar, lemon juice, Honey etc
- Artificial: Benzoates, Nitrates and Nitrites, Sulphites, Propionates etc.

### → Advantages of Food Additives and food preservatives



DATE: \_\_\_\_\_

DAY: \_\_\_\_\_



## SECTION-B

### QUESTION # 6

A

Solution

$V = \text{present value} = 8748 \text{ Rs}$

$n = \text{number of years} = 3$

$P = \text{price of w. machine 3 years ago}$

$r = \text{rate of depreciation} = 10\% (0.10)$

$$\Rightarrow \text{Formula} = P = \frac{V}{(1-r)^n}$$

$$P = \frac{8748}{(1-0.10)^3}$$

$$P = \frac{8748}{(0.90)^3}$$

$$P = \frac{8748}{0.729}$$

DATE: \_\_\_\_\_

DAY: \_\_\_\_\_

$$P \approx 11989$$

→ Hence, price of washing machine three years ago was approximately RS 11989 (Ans)

→ Part B

Given data.

$$\text{age of daughter} = x$$

$$\text{four times age of father} = 4x$$

After 5 years,

$$\text{daughter} = x + 5$$

$$\text{father} = 4x + 5$$

• 3 times → after 5 years

$$3(x + 5)$$

Now,

$$4x + 5 = 3(x + 5)$$

$$4x + 5 = 3x + 15$$

$$4x - 3x = 15 - 5$$

$$x = 10$$

So, daughter's current age is 10 years.

After 5 years:

$$= 3(10 + 5)$$

$$= 45 \text{ years (father age)}$$

DATE: \_\_\_\_\_

DAY: \_\_\_\_\_

→ After another 5 years.

girl's age from that time

$$10 + 10 = 20 \text{ years.}$$

Father's age will be

$$45 + 5 = 50 \text{ years}$$

Hence,  $\frac{50}{20} = 2.5$

⇒ So, the father is 2.5 times  
than his daughter's age.

→ Part C

Given data

$$V = ?$$

$$\text{diameter} = 12 \text{ cm}$$

$$r = \frac{12}{2} = 6 \text{ cm}$$

$$\text{Volume} = \frac{4}{3} \pi r^3$$

$$= \frac{4}{3} (3.14) (6)^3$$

$$= \frac{4}{3} (3.14) (216)$$

$$= 904.32 \text{ cm}^3 \text{ Ans.}$$



DATE: \_\_\_\_\_

DAY: \_\_\_\_\_

→ Part d

Given data

$$t_1 = 27 \text{ s} \quad , \quad t_2 = 17 \text{ sec}$$

$$t_3 = 23 \text{ s}$$

• Train 1 crosses man in 27 sec

$$L_1 = S_1 \times 27$$

• Train 2 crosses man in 17 sec

$$L_2 = S_2 \times 17$$

• Two trains cross each other in

23 sec. so

$$L_1 + L_2 = (S_1 \times 27) + (S_2 \times 17)$$

$$= (S_1 + S_2) \times 23$$

→ To find the ratio of their speed

$$S_1 \times 27 + S_2 \times 17 = (S_1 + S_2) \times 23$$

$$27S_1 + 17S_2 = 23S_1 + 23S_2$$

$$27S_1 - 23S_1 = 23S_2 - 17S_2$$

$$4S_1 = 6S_2$$

$$2S_1 = 3S_2$$

$$\frac{S_2}{2} = \frac{S_1}{3}$$

$$\frac{S_1}{S_2} = \frac{3}{2}$$

Hence their ratio of speed is 3:2 Ans.

DATE: \_\_\_\_\_

DAY: \_\_\_\_\_

## QUESTION #8

### → Part A

Given data...

d between eye and <sup>top of</sup> tree = 15m

d below feet and his eye = 1.5m

horizontal distance = 10m

Let's assume the height of trees = h

height of tree above his eye =  $h - 1.5m$

Therefore, using similar triangle

$$\frac{h-1.5}{10} = \frac{15}{10+1.5}$$

$$\frac{h-1.5}{10} = \frac{15}{11.5}$$

$$h-1.5 = \frac{15 \cdot 10}{11.5}$$

$$h-1.5 \approx 13$$

$$h \approx 13+1.5$$

$$h \approx 14.5 \text{ Ans.}$$

### → Part B

1) Sonccvoisient = Conscientious

2) Eivenpraost = Reversion

DATE: \_\_\_\_\_

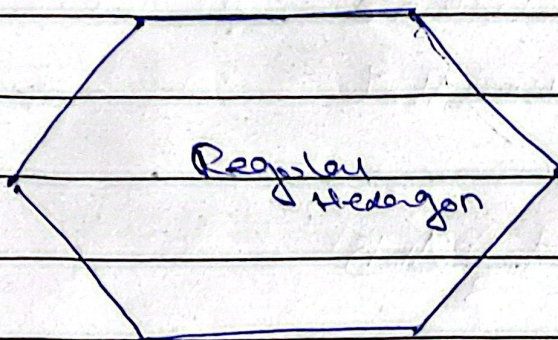
DAY: \_\_\_\_\_

3) UORSIULOC = CURIOUS

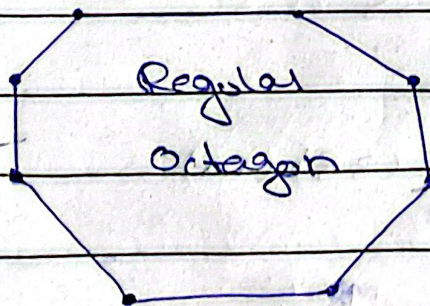
4) UNSPRESE = PENSURE

5) NMILAOPC = COMPLAIN

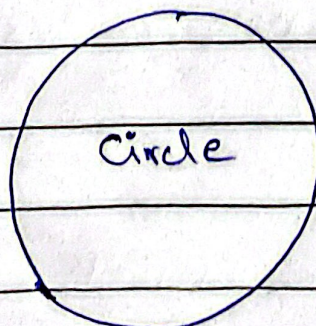
→ Part C



• It has 6 lines of symmetry



• It has 8 symmetry lines



• A circle has infinite lines of symmetry

DATE: \_\_\_\_\_

DAY: \_\_\_\_\_

→ Part 4

Given data

$$\text{Length} = 7 \text{ cm}$$

$$\text{width} = 5 \text{ cm}$$

$$\text{height} = 10 \text{ cm}$$

$$\text{Volume} = ?$$

We know that

$$V = \frac{1}{3} Abh$$

$$Ab = l \times w$$

$$= 7 \times 5$$

$$= 35 \text{ cm}^2$$

So,

$$V = \frac{1}{3} (35)(10)$$

$$= \frac{1}{3} (350)$$

$$\approx 116.7 \text{ cm}^2 \quad \text{Ans.}$$