PART - II - A

Question # 3

(a) Black hole:

Definition:

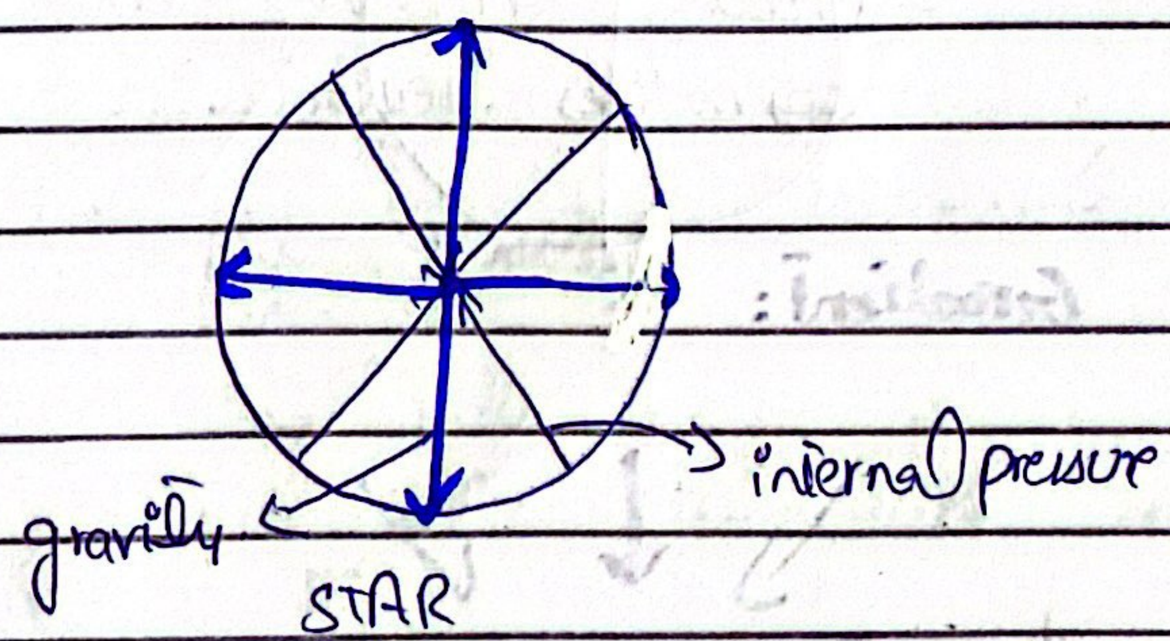
In an object of extreme density and very strong gravitation pull even light escape from it known a black hole. It is also called collapse of ster.

Formation of Black hole:

Black holes formed under the action of two forces i-e

- internal pressure and
- gravity of a star

Both of these factors are against of each other.



Ster will remain balance if the gravity of internal presure of the ster remain balance or equal or opposite, when it will imbalance ster will collapse.

So, basically when a massive ster runs out of fuel: it can no longer support its own weight and collapse. The collapse causes the star to explode in a supernova, leaving behind a dense

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core known as a neutron star. If the neutron star is massive enough, it will continue to collapse under its own gravity until it becomes a black hole.

(b) Cyclone:

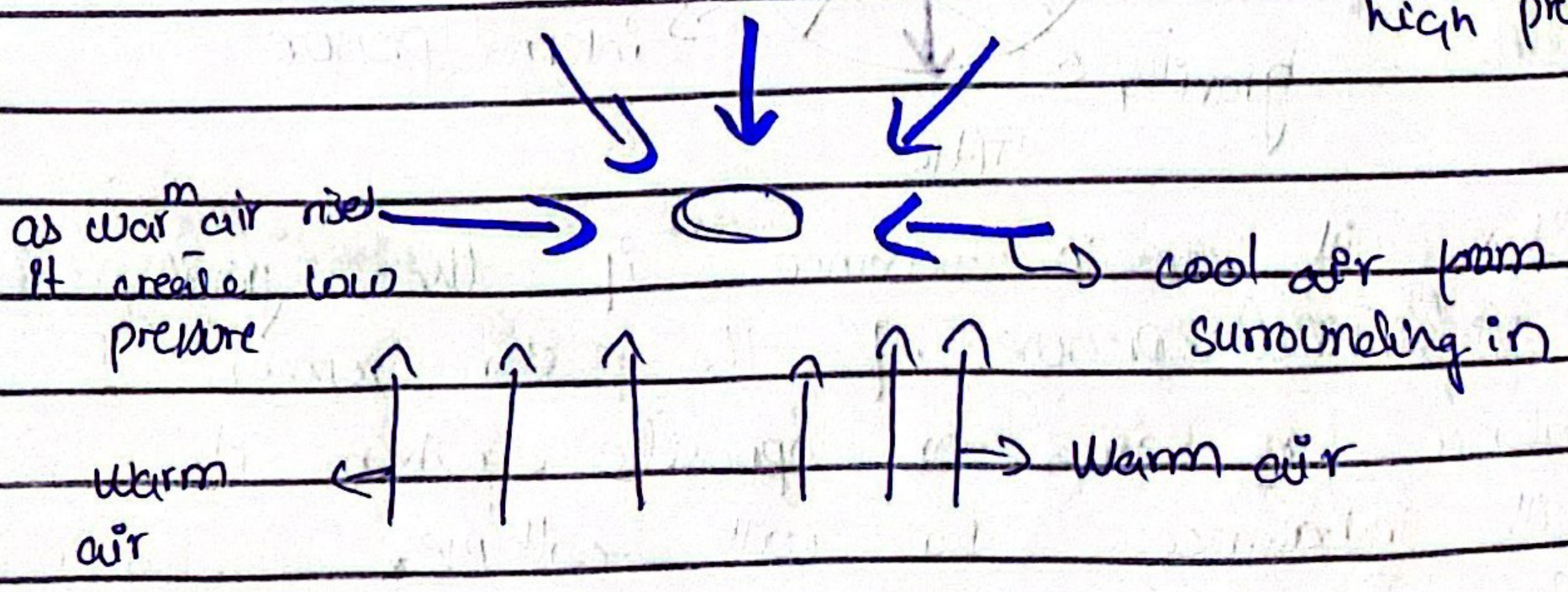
Definition:

A system of rotating wind around a low pressure core due to pressure gradients and coriollies effect of spin motion of the earth known as cyclone.

Formation of Cyclone:

Cyclone formed due to
- Pressure gradient and
- coriollies effect.

Pressure Gradient:



water body e.g sea.

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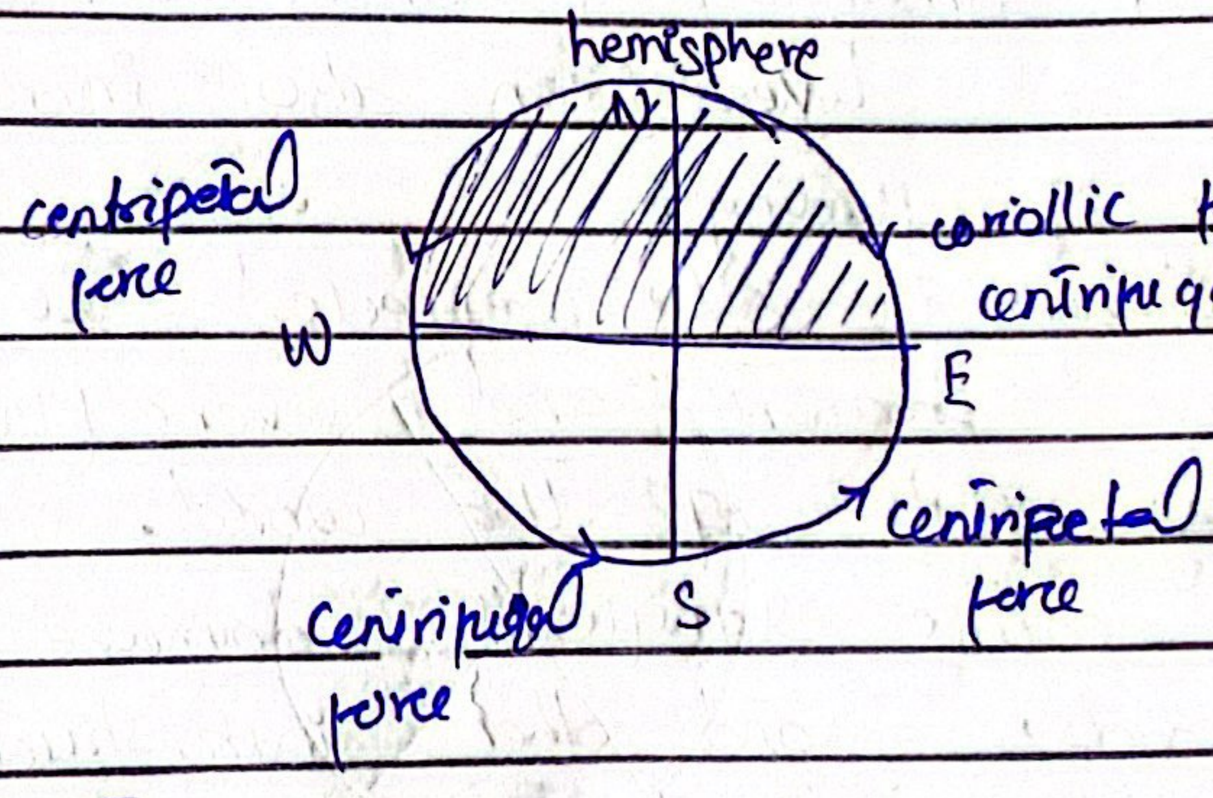
Cyclones are formed over warm ocean/sea waters when the temperature of water is low. The warm water evaporates, creating moist air that rises and cools, forming clouds. As more warm air rises, it creates a low-pressure area that causes winds to spiral inward. These winds rotate faster and faster, forming a cyclone.

Coriollis Force:

A force which leads to move the object, to the right in northern hemisphere and to the left in southern hemisphere due to spin motion of the Earth.



When the corriollic effect of spin motion of Earth is coupled with pressure gradient then the resulting phenomena formed as cyclone.

Example of cyclone:

Currently, Pakistan is vulnerable to Biparjoy cyclone and it continues to moves north-northwestward, the cyclone is 380 kms of south of karachi.

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(c) Floods:

Definition:

Floods is the most frequent type of natural disaster and occur when overflow of water submerges land that is usualy dry.

Cause of floods:

There are many factors that can contribute of floodings including natural causes such as heavy rainfall, rapid snowment, and cycstal storms.

In adition human activites such as deforestation, urbanization, and the construction of dams and levees can also increase the risk of flooding.

Climate change is also expected to cause more frequent and severe floods in many parts of the world.

Floods can cause significant damage to homes, roads, and other infrastructure and can also leads to loss of life.

It is important for individuals and communities to take steps to prepare for flooding and to take appropriate measures to reduce the risk of flood damage.

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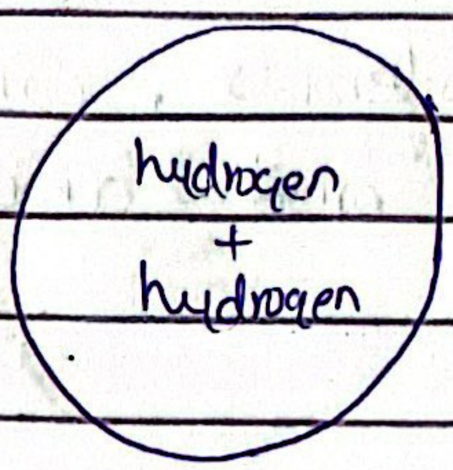
(d) Production of energy from sun:

The sun produce energy through a procen called nuclear fusion. In the suns core, hydrogen atoms are squeezed together under high prsure and temp. causing them to fuse into helium.

hydrogen + hydrogen = helium



⇒ helium

proces of fusion which generates energy.

This proces releases a tremendous amount of Energy in the form of light and heat. This energy is then carried outward form the core by radiation and convection, ultimately reaching the sun's surface and being released into space.

Factor responsible for gravity of sun

The gravity of the sun is primarily due to its mass. The sun is an incredibly large and dense object, with a mass that is 330,000 times greater than that of the Earth. This massive amount of matter creates a gravitational field that pulls other objects toward it, including the planets in our solar system.

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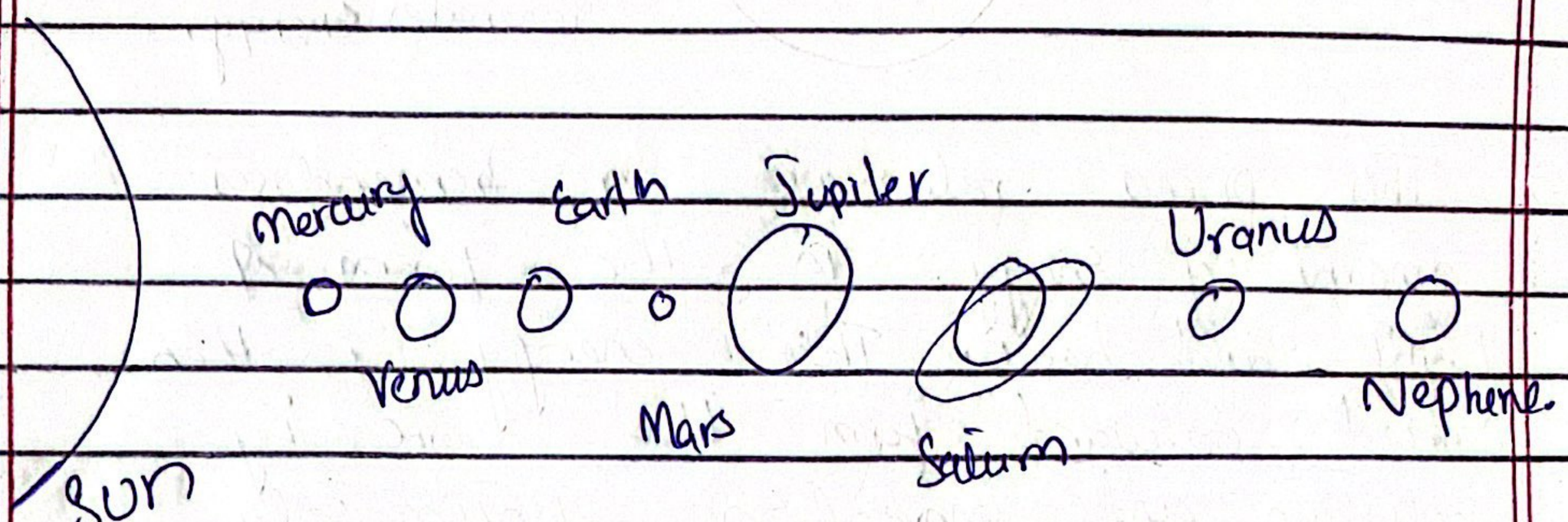
The gravity of the sun is what keeps the planets in orbit around it, and without it, the planets would fly off into space.

Definition of Solar system

The solar system is the collection of planets, moons, asteroids, comets and other objects that orbit around the sun.



It includes eight planets:
Mercury, Venus, Earth, Mars, Jupiter Saturn, Uranus and Nephune as well as the dwarf planets such as Pluto and many other smaller objects.
The solar system is located in the Milky way galaxy and it is estimated to be about 4.6 billion years old.

Question

a) Electromagnetic radiation:

Electromagnetic radiations consists of waves of electromagnetic fields.

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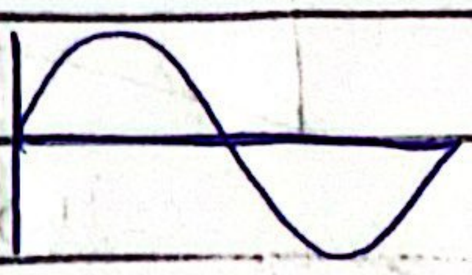
Electromagnetic waves:

These are the waves which require no medium for the propagation.

e.g; Light waves



These electromagnetic waves propagate through the space and carry momentum and electromagnetic radiant energy.

Uses of electromagnetic radiation:

Electromagnetic radiation has many uses in our daily lives.

→ It is used in communication such as radio and television broadcasting.

→ It is used in medical imaging such as X-rays and MRI scans to diagnose and treat illness.

→ It is widly used in wireless communication technologies like Wifi and bluetooth.

→ These radiations are used in industrial applications such as welding, heat treatment etc.

→ These radiations are also used in the astronomy to study the universe.

(b) **LED:**

LED stands for Light Emitting Diode. It is a type of electronic device that emits light when an electric

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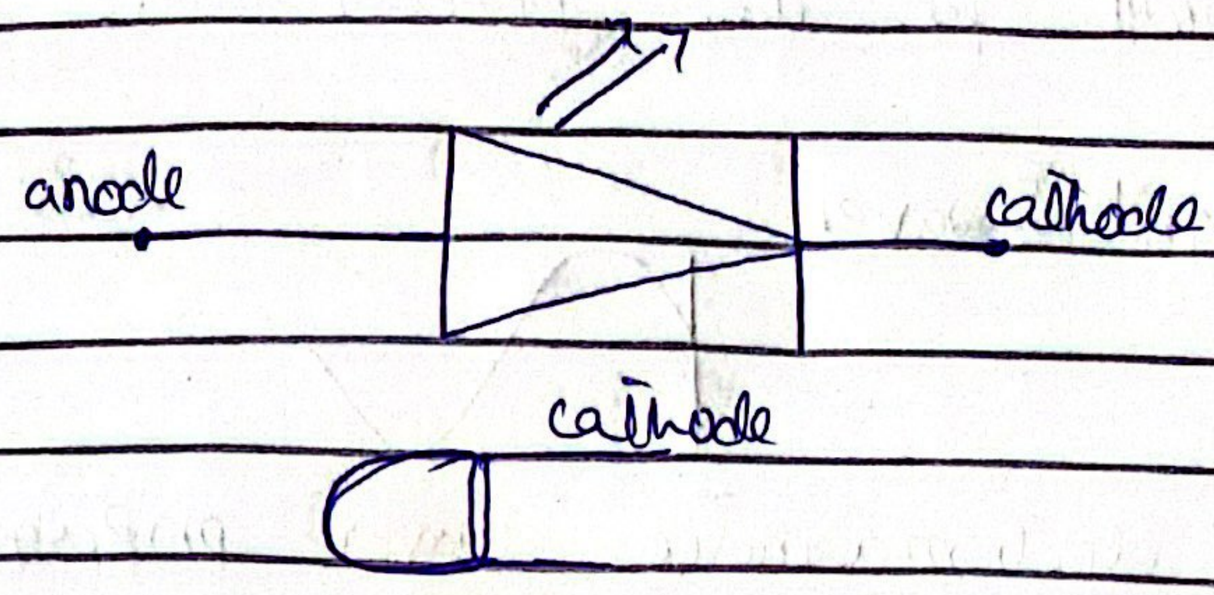
current Passed through it.

Symbol:



The symbol of LED is shown is diagram. The outward arrows represent the emitting light.

Use of LED:

LEDs are commonly used in lighting applications, such as in light bulbs, traffic signals, and electronic displays. They are more energy-efficient and longer-lasting than traditional bulbs. LEDs are a versatile and efficient technology that has many practical and creative applications.

(c) **Short Ceramic:**

Short ceramic is a type of ceramic material that has a high electrical resistance and can withstand high temp. It is commonly used in electronic components such as capacitors and resistors.

Semi-Conductor:

Semi-conductors are materials that contain properties between those of

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conductors and insulators. They can conduct electricity under certain conditions such as when exposed to light or heat. These conductors are used in a wide range of electronic devices including transistors, diode and integrated circuits.

Example,
Silicon and germanium are example of semi-conductor material,

(d) **Polio:**

Polio, also known as poliomyelitis, is a highly infective viral disease that can cause paralysis, muscle weakness and even death. This virus is transmitted through contaminated food and water, and can also spread through direct contact with an infected person.

Polio mainly affect children under the age of five and can cause permanent paralysis in some cases.

Treatment of Polio:

There is no cure for polio, but it can be prevented through vaccination. The (WHO) World Health Organization has lunched several global initiative aimed at

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eradicating Polio, and the number of cases has decreased in recent years.

Section - B

Question #7

(a) Let x be the smallest number according to given, next numbers will be

$x+1, x+2, x+3, x+4, x+5, x+6$.

the average of these numbers is

$$= \frac{x + x+1 + x+2 + x+3 + x+4 + x+5 + x+6}{7}$$

$$= \frac{7x + 21}{7}$$

$$\frac{7x+21}{7} = 20$$

by solving it

$$7x + 21 = 140$$

$$7x = 140 - 21$$

$$7x = 119$$

$$x = 17$$

$\therefore$ largest number is $x+6 = 17+6$

$= 23.$

(b) A has two two cousin C & D. and C is A's father's nephew. C is male and D is A's cousin but not brother of C means D is sister of C

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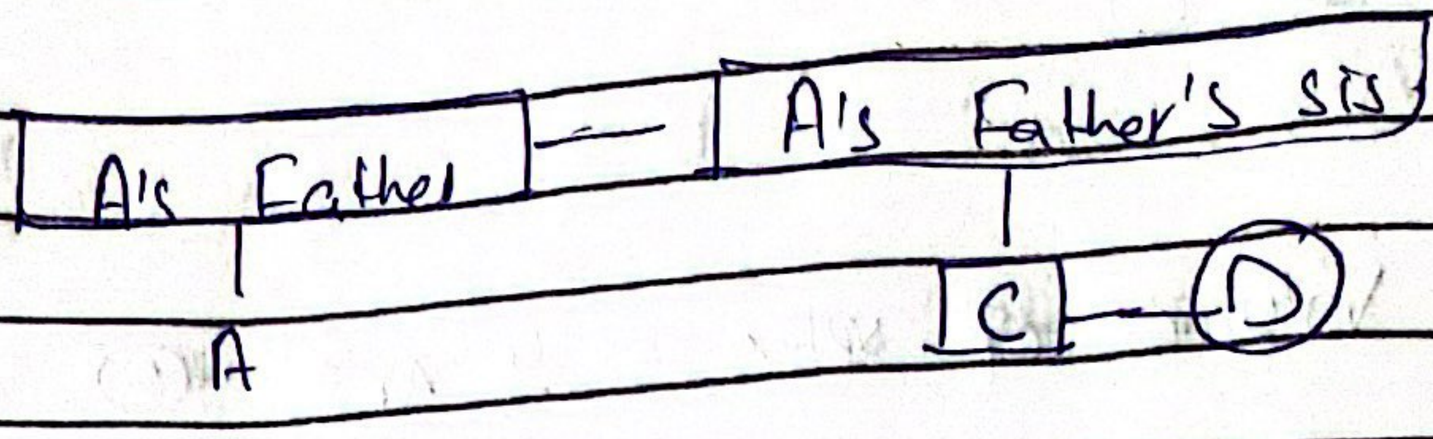

Answer is Sister.

(c) Answer is 52

$7+5=12$

$12+7=19$

$19+9=28$

$28+11=39$

$39+13=52$

(d) Sum of money is distributed among A, B, C & D in the ratio of

5 : 2 : 4 : 3

Let it be

$A = 5x$

$B = 2x$

$C = 4x$

& $D = 3x$

as given

$C + 1000 = D$

$C - D = 1000$

$4x - 3x = 1000$

$x = 1000$

So

B has $2x = 2 \times 1000$

$= 2000$ share.

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Question # 6

(a) As

Volume of sphere $= \frac{4}{3}\pi r^3$ ---①

given $d = 12cm$

$r = 6cm$

Put in ①

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

$\pi = 3.14$

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

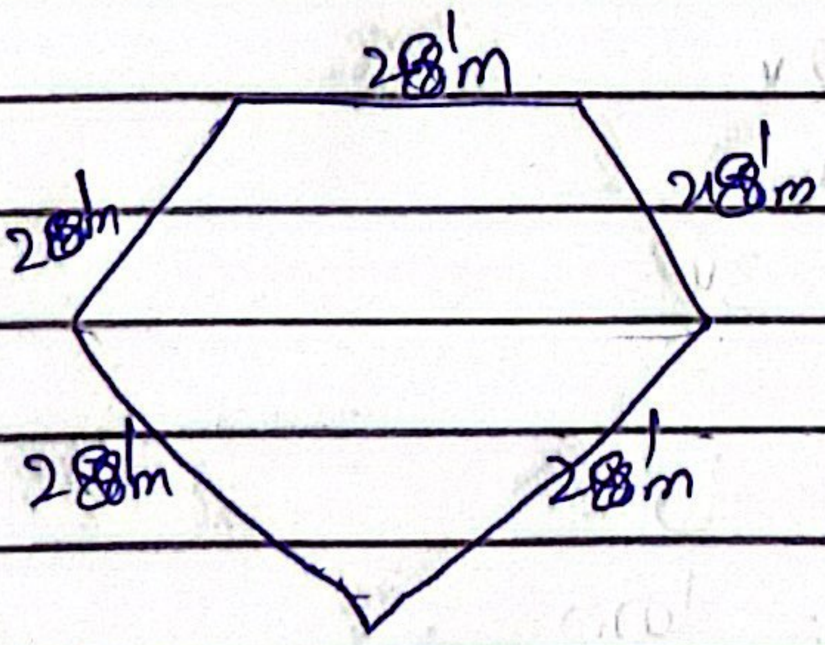
$= 1.33 \times 3.14 \times 216$

$= 902.059$

3 | 36 | 6 | 216

1.33 | 3 | 4.0 | 3 | 1.0 | 9 | 1

(d)



by adding length

$P = 4(28.1m) \times 5$

$= 14.05m$

(1) Let x be the price of washing machine 3 years ago.

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After depreciation of 10% in
1-year it would be
90% of x or 0.9x

After 2-year it would be
(0.9)(0.9x) = 0.81x

After 3-year

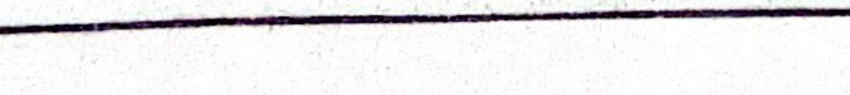
(0.9)(0.9)(0.9x) = 0.729x

as given present value ₹
8748

by making an equation
0.729x = 8748

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

x = Rs 12000 → price of 3-years ago.



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