Date: _____

Section-I

Q2 (a)

(a) How volcanoes are erupted?

→ Volcanoes erupt after earth's crust ruptures.

→ Earthquakes are often associated with volcanoes because tectonic plates can create the openings in the rocks.

→ These openings can allow magma to erupt and migrate to the surface.

→ Upon reaching the surface, magma solidifies and presents a view of molten lava.

→ The volcanic activity, after solidification, creates various landforms, such as landforms.
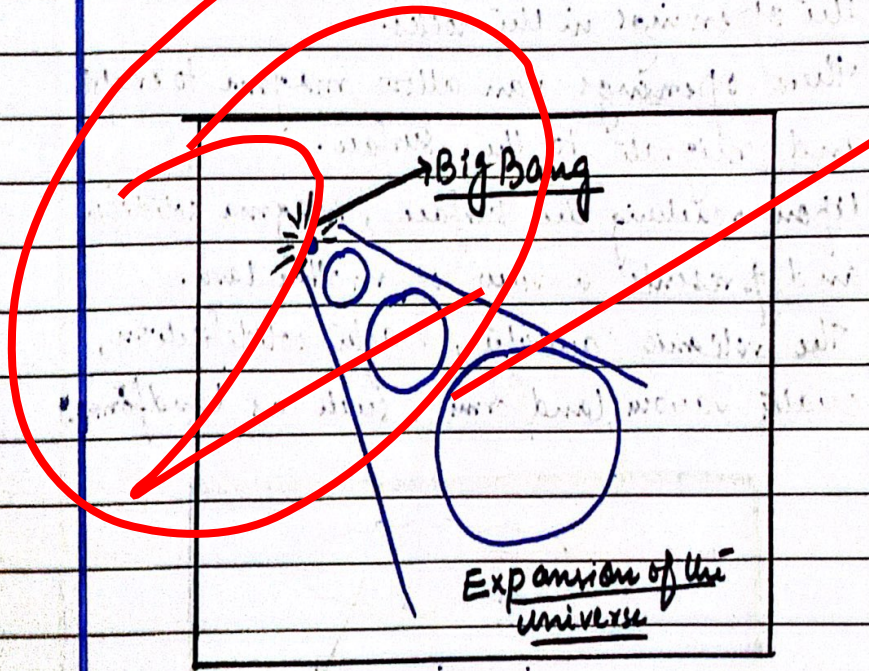
Ash Cloud

Magma

Volcano
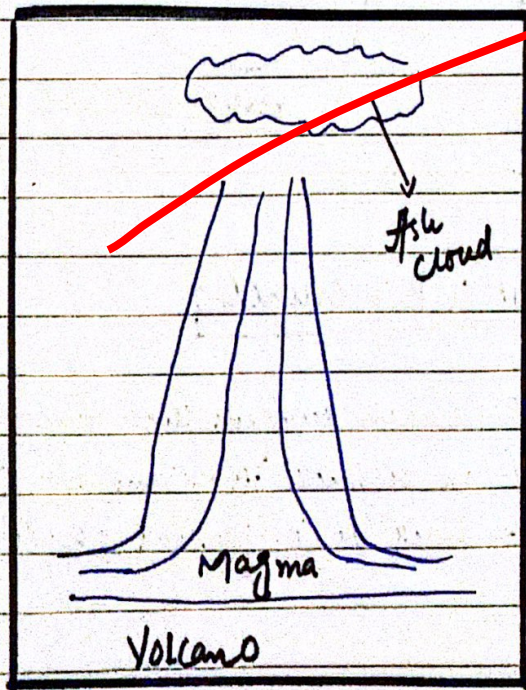
(b)

$Q_2 // (b)$

* ## <u>What is Big Bang ?</u>

→ The theory of the big bang suggests that universe originated from a small point expanding into galaxies

→ The universe originated from previously hot state.

→Big Bang

Expansion of the universe

* ## <u>What is Big crunch ?</u>

→ The Big crunch suggests that universe would reverse back its expansion — causing it to go back to its previous condition.

* How age of the universe is determined?

→ The age of the universe is determined by studying cosmic microwave background radiation.

→ This radiation provides insight from early stage of the universe — eventually determining the age of the universe.

Q₂ (c)

Five sources of renewable energy:

1. **Solar energy:**

→ Solar energy is generated from sun. The photovoltaic or solar cell helps to capture the solar energy.

Ex: Commercial use of solar panels on roof tops.

2. **Wind energy:**

→ This energy is generated from wind. The wind turbines help to produce the wind energy. These turbines are installed in coastal areas mostly.

Ex: The wind turbines in Jhimpir, Sindh.

3. **Hydropower:**

→ Hydropower is produced from flowing water of rivers or dams.

Ex: The Kishanganga and Ratle hydropower dams.

4. **Biomass :**

→ Energy from biomass is produced from waste or residue.
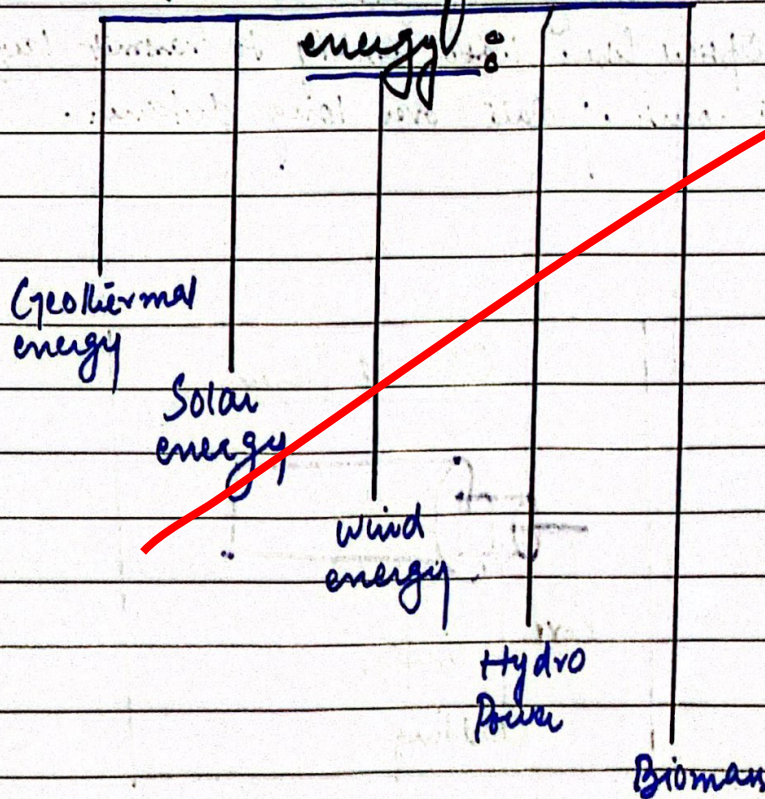
    Ex: The agriculture residue.

5. **Geothermal Energy :**

→ Geothermal energy is produced from earth's heat and activity. It is mostly generated from areas with high tectonic plate activity.

    Ex: Japan

Five Sources of renewable energy :

- Geothermal energy
- Solar energy
- Wind energy
- Hydro Power
- Biomass

Q2) (d)

* ## How Optical fibers work?

→ Optical fibers work on the basis of total internal reflection to transmit light signals over long distances.

→ The core is the central region through which light travels.

→ The cladding is the outer layer surrounds the core, which confines the light within the core.

→ The light waves undergo repeated total internal reflection within the core, allowing them to travel through the fiber

→ Optical fiber have ability to transmit large amounts of data over long distances.

Optical fiber

core   Buffer
    Cladding
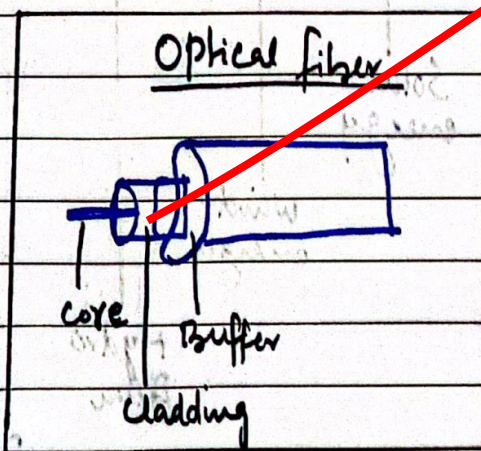
Q3 (a)

Major hurdles in developing countries to tackle the impacts of global warming?
In accordance with COP28 :

→ Developing countries top the list of most climate vulnerable countries, prone to climate induced disasters. Following are the major hurdles these countries are facing to tackle the impact of global warming :

1. **Adaptation Gap:**

Developing countries are short on funds to adapt to climate change. They are unable to take measures because of the adaptation Gap. According to the United Nations Environmental Program adaptation gap report 2023, developing countries require $215 billion annually for climate adaptation; but they are only receiving $21 billion. This point was raised during COP 28, Developing countries demanded Loss and damage fund and asked for climate reparations.

2. Fossil fuel-reliant energy consumption

Developing countries are unable to initiate transition to renewables energy resources. The lack of funds, along with adequate technology, halt this much needed transition. They are reliant on imported fossil fuels, impacting their economy and environment. During the COP 28, developing countries asked petro states to phase-down fossil fuels and contribute to the clean energy.

Q3. (b)

Balanced Diet:

→ Balanced diet is the consumption of variety of foods, taken from different food groups.

→ It helps to prevent any deficiency in the body.

→ The intake of proper amount of Carbohydrate, fats, protein, vitamins, minerals, and fiber is known as balanced diet.

→ The balanced diet saves from diseases, and deficiencies.

→ The appropriate proportions support overall health and well-being.

Protein | Fat | Carbohydrates | Minerals | Vitamins

Q3 (c)

→ Machine learning as the subset of artificial intelligence (AI) has revolutionized the today's world by bringing automation and advancement.

→ The tailored results from the AI has changed the outlook of different fields.

→ It has revolutionized the military capability by introducing early warning systems, control system, and precision attack capability.

→ AI has also brought change in healthcare by introducing accurate diagnosis, and drug discovery.

→ AI in education is another marvel, of aiding students and teachers in learning.

Cybersecurity Military Education

AI

Industries Healthcare

Courts
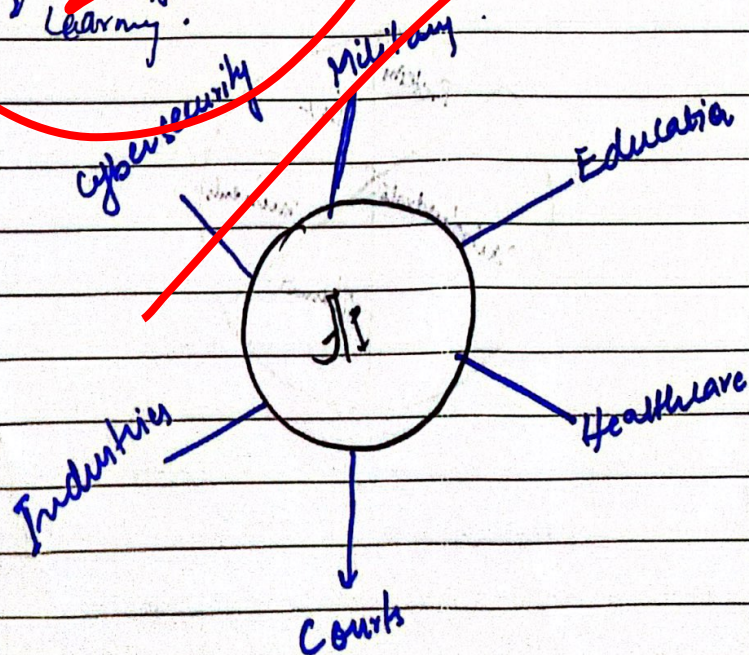
Q3/ (d)

* **RAM:**

→ Random Access memory (RAM) is used for temporary storage of memory in the computer.

→ It loses its content when the computer is powered off.

* **ROM:**

→ Read only memory (ROM) stores permanent data.

→ ROM saves data when the power is turned off — preserves data.

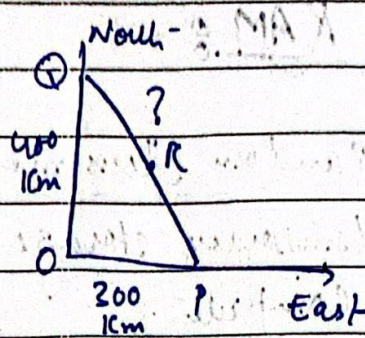| RAM	ROM
→ Volatile memory	→ Non-Volatile memory
→ used for temporary storage of data	→ Permanent data storage.

Section 11

Q7 (a)

sol:-

$$\frac{1}{2} b \times h$$

$$\frac{1}{2} \, 400 \times 300$$

$$= 60,$$

$$QR^2 = QO^2 + OP^2$$

$$QR^2 = 400 \, km^2 + 300 \, km^2$$

$$QR^2 = 16,000 + 90,000$$

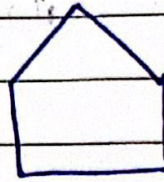$$QR^2 = 250,000$$

$$\boxed{QR = 250,000 \, km}$$

Q7 (b)

Sol:-

Area = L×W

= 25×5

= $\boxed{25 \, cm}$

(c)

Sol:-

$15 = \dfrac{3x + 5x + 7x}{3}$

$\Rightarrow 15 = \dfrac{15x}{3}$

$\Rightarrow x = 3$

Multiplying total no of boys with x

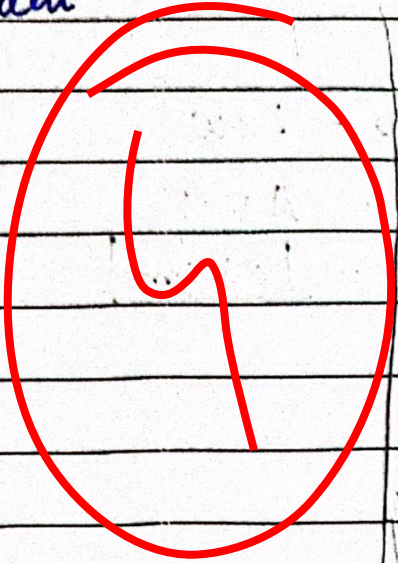$\Rightarrow 3 \times 3 = 9$

$\boxed{\text{Age of the youngest boy} = 9}$

Q8	(c)
(1)	Shirt (ii) Garden
(iii)	
(iv)	London
(v)	Holiday

Q8	(b)
(i)	100
(ii)	25
(iii)	49
(iv)	69
(v)	54.