

GSA

Section II

Q: NO: 6

Part a

Given data

Candidate's votes respectively = 15000, 10000, and 8000

To find: Percentage of the winning candidate.

Solution:

As it is given that we have to find the percentage of total votes of the winning candidate. Hence, it is clear that the use would be needed to find the total votes of the constituency.

$$\text{Total votes} = \text{Candidate (1) votes} + \text{Candidate (2) votes} + \text{Candidate (3) votes}$$

From the given

$$\Rightarrow \text{Total votes} = 15000 + 10000 + 8000$$

$$\Rightarrow \text{'' ''} = 33000 \rightarrow (1)$$

As the formula to find the percentage of winning candidate's votes will be

$$\text{Eq (2)} \quad \% \text{ age of winning candidate votes} = \frac{\text{Votes received by the candidate}}{\text{Total no. of votes}} \times 100$$

From the given it is evident that the winning candidate has 15000 votes.

Hence by putting the values of total votes from (1) and winning candidate votes into equation (9)

We get

$$\% \text{ age} = \frac{15000}{33000} \times 100$$

$$\% \text{ age} = \frac{1500}{33}$$

$$\% \text{ age} \approx \del{45.4} 45.4\%$$

Hence the % age of the winning candidate in the Islamabad constituency is approximately 45.4%.

Ans

Part b.

Given data :

Ratio of angles of a triangle = 3:4:5

To find: Each angle

Solution

Let's suppose the one part of an angle's ratio is x .

Hence, total parts of ratios of all angles will be

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

$$\Rightarrow 12x \rightarrow 12$$

Now,

it is also clear that the given statement insinuates, ~~to~~ it is a triangle and as we know that total angle of a triangle is 180° .

Hence \rightarrow Total angle of a triangle = 180

As the angle is divided into 3 ratios having total 12 parts.

Thereby, ~~to~~ find the each angle, first we have to find one part of

ratio hence formula will be:

$$1 \text{ part} = \frac{\text{Total sum of angles}}{\text{Total parts of ratio}}$$

$$x = \frac{180}{12}$$

(A) \rightarrow $x = 15$ \rightarrow Value of one part.

It has to put into each ratio one by one.

As 1st angle ratio = $3x$

$$\therefore \text{ " " } = 3(15)$$

$$\text{ " " } = \underline{45^\circ}$$

Similarly, the 2nd angle ratio = $4x$

$$\text{ " " } = 4(15)$$

$$\text{ " " } = \underline{60^\circ}$$

On the same pattern, the 3rd angle ratio = $5x$

$$\text{ " " } = 5(15)$$

$$\text{ " " } = \underline{75^\circ}$$

Hence, the 1st angle is 45° , 2nd angle 60° and the 3rd angle is 75° .

$\boxed{45^\circ, 60^\circ, \text{ and } 75^\circ}$ Ans

Part:c

Given

→ Each group contains = 4 boys and 6 girls

→ Available girls = 102

To find: How many boys are required for making such groups with the available girls.

Solution:

As in the given, it is clear that in a group, there can be only 6 girls and 4 boys. Whereas, the value for available girls is 102 which is also given.

Hence, from this we can calculate how many groups in total can be formed with this particular number.

Formula to calculate total groups that can be formed from these girls will be:

$$\text{Total groups} = \frac{\text{No. of total girls}}{\text{No. of girls in one group}}$$

$$\Rightarrow \text{Total groups} = \frac{102}{6}$$

$$\Rightarrow \text{Total groups} = 17$$

As, it is clear that total groups that can be formed to available girls are 17.

Thereby, now we can easily find how many boys are needed to complete the requirement of the group.

As, for one group number of boys required or permitted = 4

Hence, for total groups, number of boys will be:

$$\therefore = \text{Total groups} \times \text{No. of boys in one group}$$

$$\therefore = 17 \times 4$$

$$\therefore = \boxed{68} \text{ Ans}$$

Hence, total number of boys that are required to fulfill the demand are 68.

Part d.

Given \rightarrow Ratio of present ages of A & B = 6:7
 \rightarrow After 5 years, ratio = 7:8

To find: present ages of A and B.

Solution:

Let's suppose the present ages of A and B are 'x' and 'y' respectively.

Hence, from the given data, it can be implied

$$x:y = 6:7$$

$$\frac{x}{y} = \frac{6}{7}$$

$$\boxed{x = \frac{6y}{7}} \rightarrow \text{Equation (1)}$$

As the present ages are 'x' and 'y', therefore,

after 5 years ages would be 'x+5' and 'y+5'.

Hence, ratio after 5 years = $x+5 : y+5$

⇒ Ratio after 5 years = $x+5 : y+5 \rightarrow (i)$

From the given, ratios after 5 years would be 7:8.

By applying value in eq (i)

$$\Rightarrow x+5 : y+5 = 7:8$$

$$\frac{x+5}{y+5} = \frac{7}{8}$$

$$8(x+5) = 7(y+5)$$

$$8x + 40 = 7y + 35$$

$$8x - 7y = 35 - 40$$

$$\boxed{8x - 7y = -5} \rightarrow (2)$$

By putting value of 'x' from eq (1) into eq (2).

$$8\left(\frac{6y}{7}\right) - 7y = -5$$

$$\frac{48y}{7} - 7y = -5$$

$$\frac{48y - 49y}{7} = -5$$

$$-y = -35$$

$$\boxed{y = 35} \rightarrow (3) \text{ present age of B}$$

By putting value of 'y' from eq (3) into eq (1).

We'll get:

$$x = 6(35)$$

$$\boxed{x = 30} \xrightarrow{\text{Present Age of A.}}$$

Hence, the present ages of A and B will be 30 and 35 respectively.

Q.No: 8

Part a

Given: \rightarrow Sum of three consecutive terms = 273
 \rightarrow all terms are odd.

To find: Three odd numbers.

Solution:

Let suppose the 1st term is 'n'.
As it is given that numbers are odd. Hence, the next consecutive terms will automatically

be ' $n+2$ ' and ' $n+4$ '.

From the given
Sum of three terms = 273

By taking the supposed data, equations
will be

$$\Rightarrow (n) + (n+2) + (n+4) = 273$$

$$\Rightarrow n + n + 2 + n + 4 = 273$$

$$3n + 6 = 273$$

$$3n = 273 - 6$$

$$3n = 267$$

$$n = \frac{267}{3}^{89}$$

$n = 89$ value of 1st term

Hence, the 2nd term value will $89 + 2 = 91$

Similarly, the third term will be ~~89~~
 $89 + 4 = 93$

Hence, the ^{odd} terms which are consecutive and
their sum is 273 are $89, 91, \text{ and } 93.$

Ans

iii)

1, 7, 15, 25, 51

iv) 0, 2, 6, 12, 20, 30, 42

Two series following a particular pattern.
Every term is the result of a number's square and then subtraction of the same number from its own square.

$$\Rightarrow (0)^2 - 0 = 0$$

$$\cdot (2)^2 - 2 = 4$$

$$\cdot (3)^2 - 3 = 6$$

$$\cdot (4)^2 - 4 = 12$$

$$\Rightarrow (5)^2 - 5 = 20$$

$$(6)^2 - 6 = 30$$

$$(7)^2 - 7 = 42$$

v) 48, 24, 72, 35, 108 -

C-

i) THIRST

SHIRT

ii) GINDREA

DANGER

iii) SCHAMOT

STOMACH

iv) ONLYDO

LONDON

v) HIODALY

MOLIOFY

Part d

Given Sara's mother = 6 times older than Sara
Sara's brother = 2 times
Sum of their ages in 3 years = 72

To find

Sara, Ali and their mother age.

Solution

Let's suppose Sara's mother is

'x'

From this, the ^{present} age of Sara's mother will be:

^{Present} mother age = six times of Sara's age

$$\Rightarrow x = 6x \rightarrow \text{ii)}$$

Similarly, Ali's age will be:

Present age of Ali = 2 times of Sara

$$x = 2x \rightarrow \text{iii)}$$

As it is given after 3 years, their sum of ages will be 72.

It implies, after 3 years Sara, Ali and their mother's age will be $x+3$, $6x+3$, and $2x+3$ respectively.

Hence, sum after 3 years

$$\Rightarrow x+3 + 6x+3 + 2x+3 = 72$$

$$9x + 9 = 72$$

$$9x = 72 - 9$$

$$9x = 63$$

$$x = \frac{63}{9}$$

$$\boxed{x = 7} \rightarrow \text{Sara's age.}$$

By putting value of 'x' into eq (i) and eq (ii).

$$\text{eq (i)} \Rightarrow \text{Mother's present age} = 6(7)$$

$$\text{" " " " } \Rightarrow \boxed{42} \rightarrow \text{mother's age}$$

$$\text{eq (ii)} \Rightarrow \text{Ali " " " " } = 2(7)$$

$$\text{" " " " } \Rightarrow \boxed{14} \rightarrow \text{Ali's age.}$$

Hence, the present age of Sara, Ali and their mother are 7, 14, and 42 respectively.

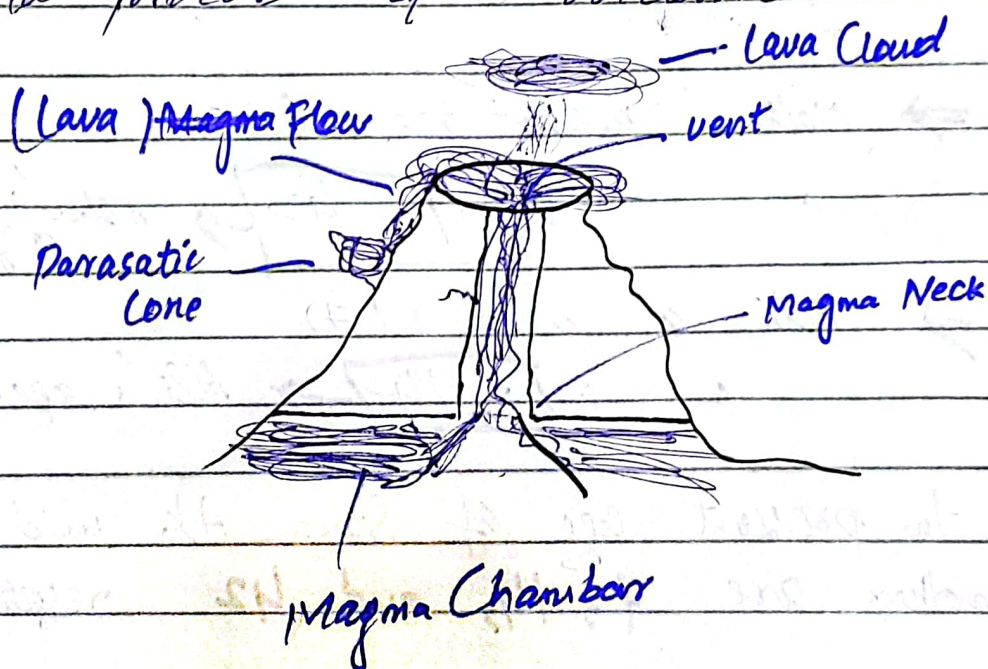
Section - I

Q: NO: 2

Part: a

Volcanic Eruption

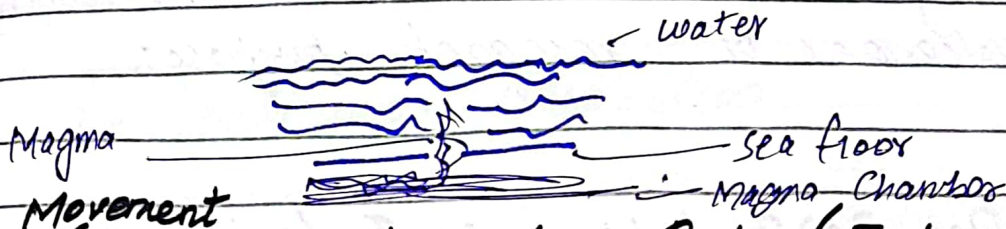
Volcanic eruption is a natural phenomenon in which magma under the earth comes outside of the earth surface. Certain parts are included in this phenomenon, everyone playing a special role. There could be certain reasons for its eruption. However, before shedding light upon the reasons, it is pertinent to draw the diagram which enlist some essential aspects associated with the process of volcanic eruption.



Following are the major reasons which results into the volcanic eruption as it can be said this is how volcanic eruption happens.

i) Sea-Floor Spreading

Sometimes magma gets a chance to come outside when sea floor is spreads itself. The Ring of Fire & Pacific Ocean is a glaring example.



ii) ~~Collision~~ of Lithospheric Plates (Tectonic plates)

On volcanic eruptions, ~~collisions~~ ^{movement} of lithospheric plates has been a major cause. Sometimes when plates move apart or subduced then magma gets a chance to come out. So this is another reason how volcanoes erupt.

iii) Percolation of cold water

Percolation of cold water into ground surface and then having contact with molten hot material turning into steam also causes its eruption

iv) Buoyancy of Magma due to ^{high} pressure

Magma also sometimes gets too much pressure due to many activities around its surrounding which also gives it a push to place a strong buoyancy force and helps to erupt it.

v) Man-made activity

Man-made activities are also a reason for ^{even} volcanic eruption. Sometimes it is done to keep the activities of volcanoes or research purposes.

18th Dec 2023 Volcano in Iceland

Two volcanoes mentioned above was the result of 2 to 3 causes. As it is could be due to water percolation, buoyancy of magma or ~~etc~~ plate tectonics activity. Hence it can be said that volcanic eruption is an activity in which magma gets a chance to come out of its chamber due to certain reasons.

Part - d

Optical Fibres

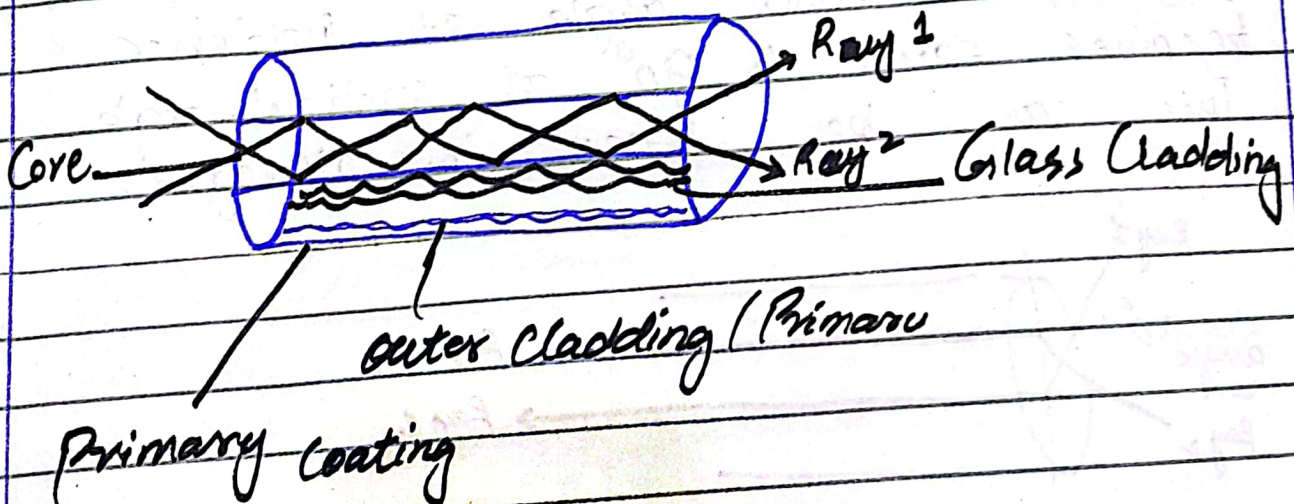
Optical fibres are thin glass strands that are used to transmit light signals from one place to other place.

These work basically on 2 fundamental principles.

1- Total Internal Reflection

2- Continuous Refraction

Before discussing these 2 principles, below is made a diagram of fibre optic composition.



2- Total Internal Reflection

When rays enter into fibre optical network then ~~two~~ some of them are reflected internally because their angle of incidence is greater than ^{critical} angle. Diagram describes clearly.

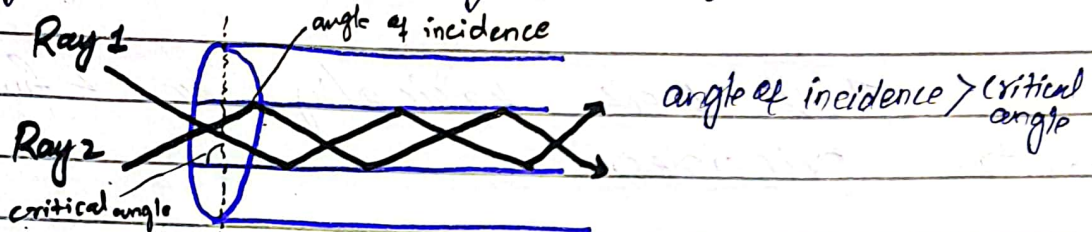
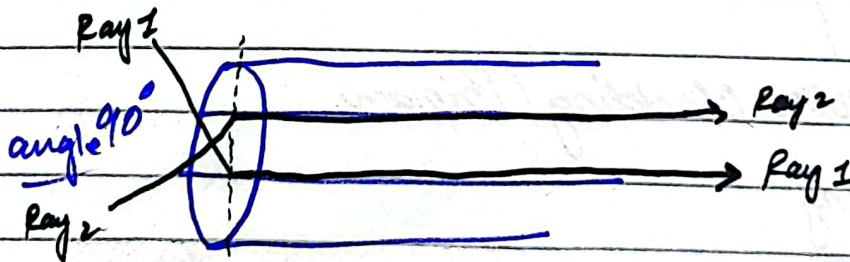


Diagram a: Total Internal Reflection

2- Continuous Refraction

The 2nd principle which is followed in fibre optics is continuous refraction. It happens when angle of incidence becomes equal to 90° at critical angle. This can be seen in diagram.

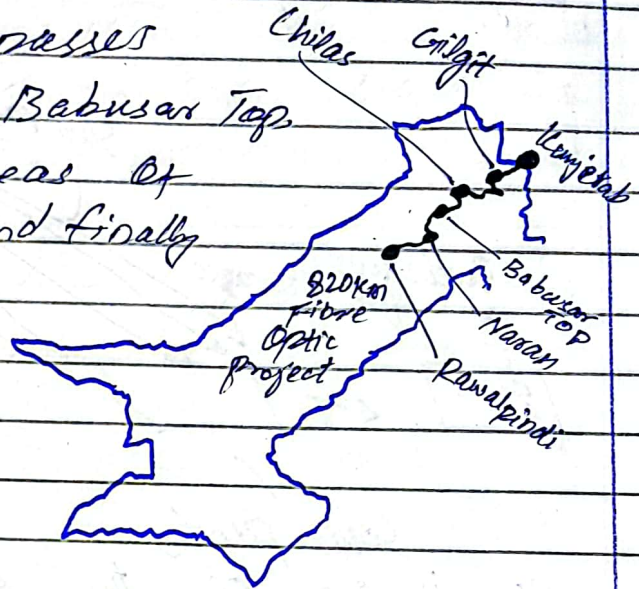


820 km Fibre Optic under CPEC: A glimpse.

Under CPEC, fibre optic project stretches over 820 km. It starts from Rawalpindi city and passes through Naran, ~~Chitral~~ Babusar Top, Chilas and other areas of Gilgit-Baltistan, and finally ends in China.

~~map of Pakistan~~

The map clearly shows the description.



C- Five Sources of Renewable Energy

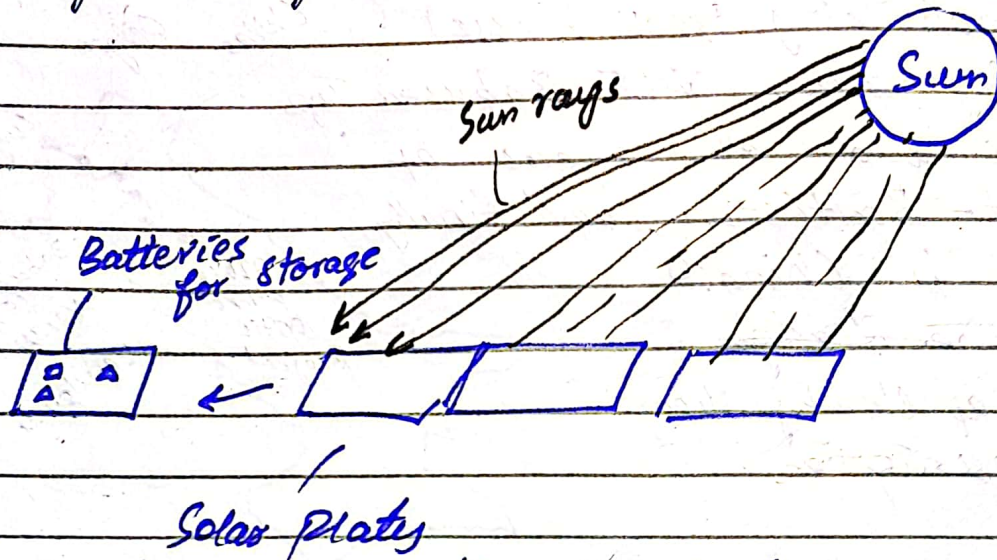
Energy is the basic need of humans. It can be attained from two major resources:

- i) Renewable energy resources
- ii) Non Renewable energy resources

Now, the discussion is about 1 major renewable energy resources.

1- Solar Energy: The 1st renewable resource of

energy is sun. Sun emits hot rays which contains a large amount of energy. This energy can be store through usage of solar plates.



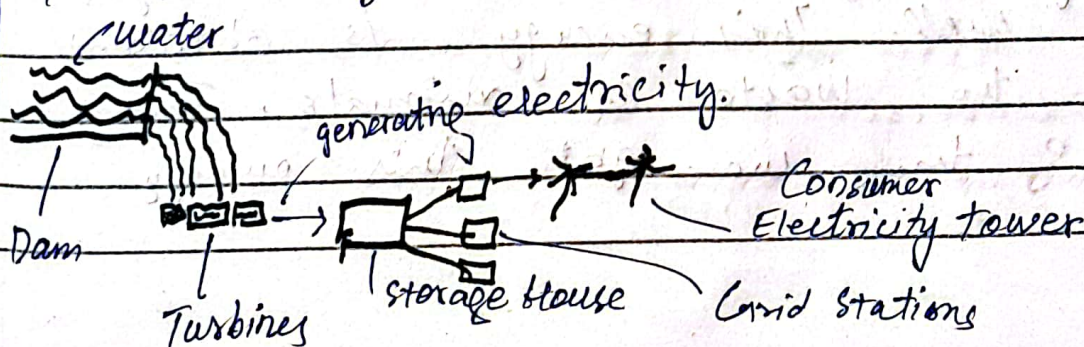
It is one of the latest forms of energy that humans can use for their daily activities which require energy.

ii- Wind Energy: Another form of energy which is renewable that is wind energy. This energy is often obtained near coastal areas as their speed of wind is greater. When wind blows, certain technological devices and wind fans are placed in its path which start spinning and generate electricity. It is

also another less costly form of energy. In many parts of world, this energy is used for fulfilling basic needs.

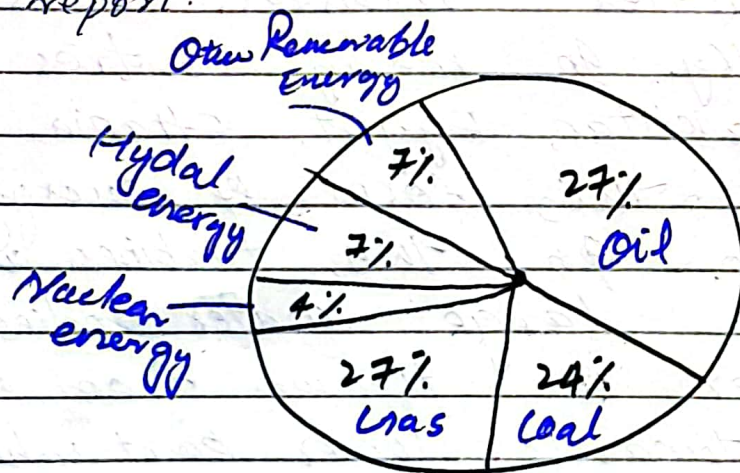
In Pakistan, under CPEC, three projects including Bhimbhore, Thatta, and Jhimpir Wind Power Project (320 MW) are clear evidence of it.

iii- Hydal Energy: Hydal energy is the form of energy which is obtained by using water resources. It is also less costly. In many countries including Pakistan, Egypt, Ethiopia, India, China, this form of energy is very common. In this, turbines are placed before large water bodies and then water is taken from a high position towards lower part where turbines are fixed. When water falls on turbines, the turbines start functioning and create energy which is processed in a particular manner for the usage.



iv- Nuclear Energy

Nuclear energy is the cheapest resource or way of producing energy. In this, ~~reactors~~ nuclear chains are used to produce to form electricity. However, it is also true that despite being the cheapest, it is one of the least adopted forms of energy. It can also be substantiated from the data provided by International Energy Agency's recent report.



v- Biomass

It is another form of renewable energy which is called as biogas as well. This energy is obtained from the waste of animals. Through this we get this energy.

Part 6

Big Bang and Big Crunch

Big Bang and Big Crunch are two conceptions regarding the formation of universe. Big Bang concept was given by Hubble — a scientist and cosmologist. He said:

Universe once was at a point of singularity. The point was even smaller than an atom but much denser and with high gravitational pull. He said, thus due to maximum gravitational pull and peak of density, the point suddenly exploded and the universe came to existence.

In other words, universe is a consequence of a sudden heavy explosion.

On the other side Big Crunch is the spot in the universe which is very important in the study of universe.

It was not much explained by cosmologist as the Big Bang.

✓ Age of Universe

Age of universe can be calculated in various ways mentioned above:

i) By calculating the age of constellation of stars

1st of all universe's age can be calculated through looking into the age of cluster of stars.

ii) By studying the age of old stars

Similarly, by calculating the age of old stars, the age of universe is also calculable.

iii) By the speed of chemical particles or celestial bodies.

Lastly, the age of universe can also be calculated through measuring the speed of particles moving in the universe. It can also be done by studying celestial bodies.

Q: No - 3

Part: a

Major Hurdles in Developing Countries to Tackle the Impacts of Global Warming with COP-28

The ADB (Asian Development Bank) while keeping the ongoing extreme weather patterns, frequent severe floods due to hot temperatures has published a report regarding climate change.

In the report, 2023 is declared as the hottest year of the history of mankind.

However, the other part is what are the major hurdles that ^{creating disturbance for} developing countries to tackle the impacts of global warming. Major are discussed with special reference to COP-28.

✓ Lack of funds to recover loss and damage and COP-28

Developing states do not have much money to fight against the impacts whereas COP-28 promises the fund.

Plus, if the damage and loss funds are timely given to developing states, they can be stronger against the issue.

✓ Demand of Technology dealing with Climate change and COP-28

Similarly demand of alternate technology which is resilient to climate is also another hurdle for developing states. In COP-28 nations have pledged that they would work on it.

✓ ~~CO2~~ Failure in Mitigation and Preparedness of Developing states

Developing states are also facing troubles in preparing and mitigating the future events caused by climate change. In COP-28, Antonio Guterres has emphasized nations to take certain actions and collect funds for it.

✓ Developed states excessive burning of fossil fuels and COP-28

Developing states are unable to convince developed states that the latter's activities are disturbing the former. However in COP 28, it is said that 'Moving away from fossil fuels is our priority.'

Unchecked Reforestation due to population burden and COP-28

Reforestation is still a common phenomenon in developing states leading to their failure in tackling impacts of global warming. In COP 28, though not officially but verbally, it was another point of concern.

In short, developing states are facing huge troubles in dealing with its impact, in global warming and COP-28 provides a thicker rope to them in this struggle.

b- Balanced Diet

Balanced diet is a food oriented concept in which nutrients after say that human body needs a proper diet for its proper functioning. Thus, from his

It can be said that a diet which includes all essential ingredients required for a functional and smooth working of humans is called balanced diet.

It contains carbohydrates, nutrients, vitamins, iron, fats, calorie etc.

For example, a balanced diet must be that which guarantees a specific ~~part~~ consumption of water portion.

Similarly, it also takes of particular need of carbohydrates.

Vitamins including A, B, C remain an essential part of balanced diet.

Hence it can be said balanced diet is a mixture of all important ingredients that fulfill the basic energy requirements of human body and mind.

Part C

Machine Learning and AI; and It's role in world

Machine learning is the subset of artificial intelligence. It uses a language. It does not need translators to work. It copies the human intelligence and tries to act as humans.

It was the basic part of AI world that initiated few miracles.

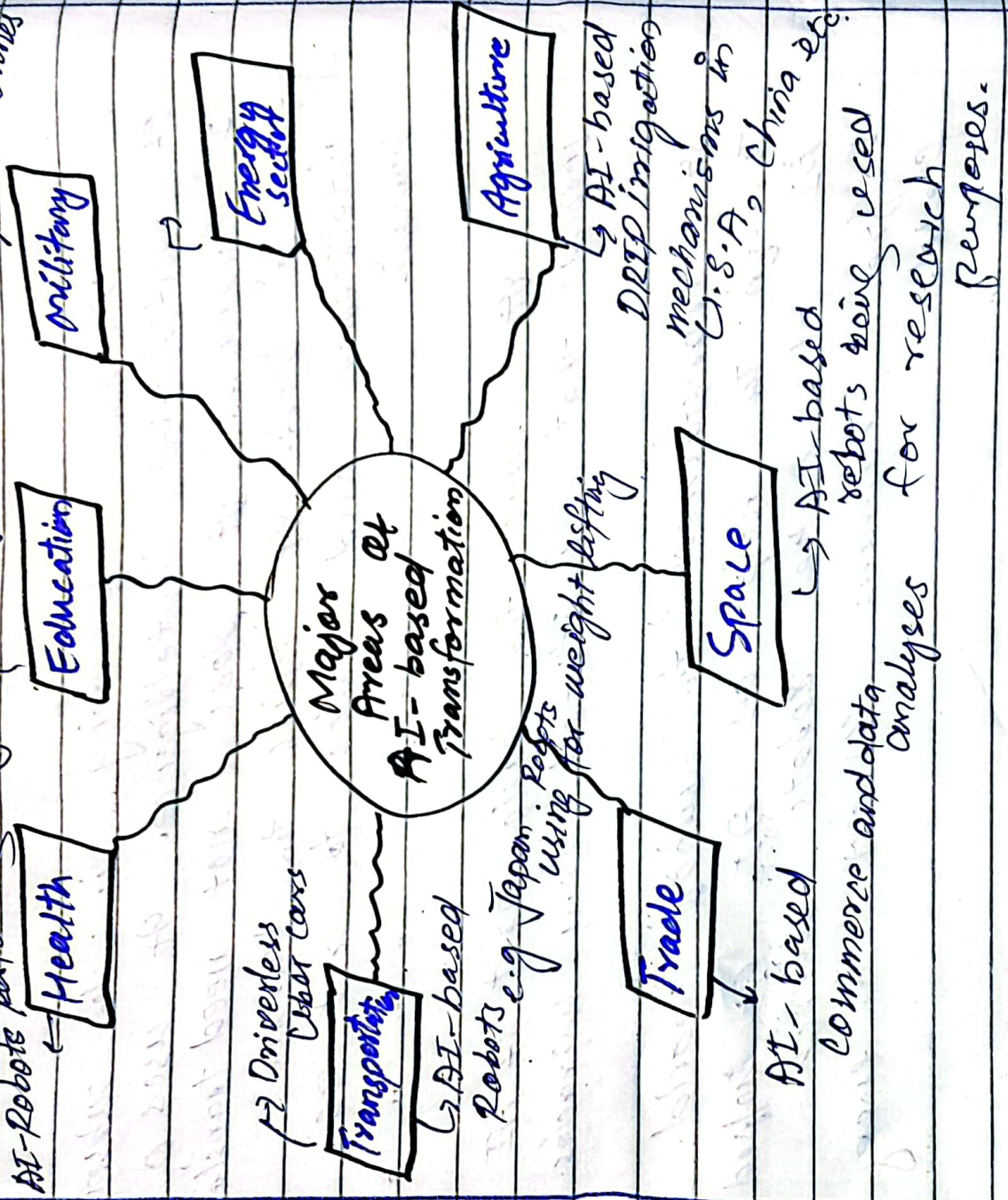
It transformed the whole world through the help of AI. It helped AI to make robots work helped humans almost in every field.

It transformed and revolutionized the world through bringing robots that performed medical surgeries.

In schools, it helped to bring about new ways of learning.

It strengthened to militaries of the world.
 It revolutionized the agriculture sector in China
 Shows the major areas where it brought revolution.

AI-Robots performing surgeries
 AI-based education e.g. Chat GPT
 AI-based missiles and Drones



Driverless Uber Cars

Transportation

AI-based Robots e.g. Japan Robots using for weight lifting

Trade

AI-based commerce and data analyses for research purposes.

Hence, it can be said AI through using its subset - machine learning was revolutionized to world.

Part: d

RAM

It stands for Random Access memory.

Volatility

It is volatile. It is lost whenever a computer loses its power.

Speed

It is higher in speed. As it works in real time. It is used for processing different activities of computers.

Storage

It is lower in storage. Often it is ranged from 2GB to 16GB.

ROM

It stands for Read Only Memory.

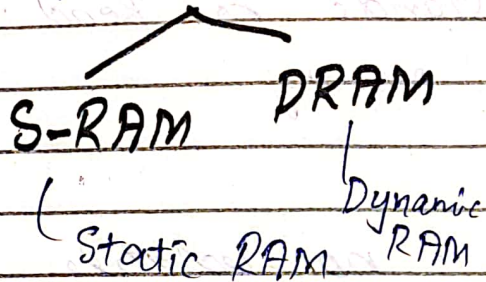
It is non-volatile. It remains even when computers are shut down.

It is less speedy as compared to RAM. It is only readable memory.

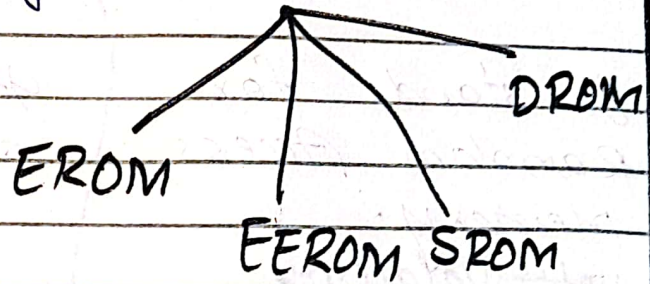
It is higher in storage. As it is required to run computers utility programs.

Types

Basically there are only two types



while it has four types.



Conclusion

Hence, it is clear RAM is ~~less~~ volatile, higher in speed and only real time working memory.

while ROM is non volatile and lower in speed. However, it is greater in memory.