

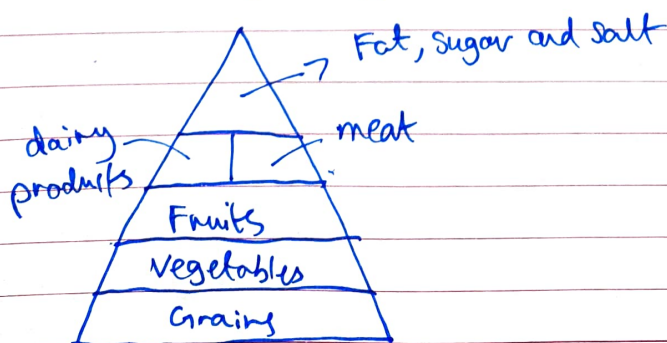
Q.3

(a) → Major Hurdles to tackle Global Warming

For developing countries there is a plethora of challenges they face. One of the most important is funding because developing countries have limited resources to allocate to combatting climate change. In addition, as discussed at the COP28 summit, another significant challenge is the lack of funding required to deal with the after effects of natural disasters, as was the case with Pakistan, where it is estimated that over \$16 billion was lost due to the destruction caused. Another challenge is the lack of specialized human resource, for research and development of effective policy models.

b) → Balanced Diet

A balanced diet is defined as a diet that includes all necessary macronutrients and micronutrients required for a healthy life. In macronutrients, the human body requires carbohydrates for energy, protein for cell growth, and fat for energy and insulation. Micronutrients include vitamins and minerals necessary for the optimal functioning of the body. These include Vitamin A, D, K, C, B1, B12 as well as potassium, magnesium and iron for example. The lack of a balanced diet would lead to malnutrition and deficiency diseases. In addition to the inclusion of these nutrients, the correct quantity of these is also necessary.



c) → How Machine Learning Has Revolutionized The World

Machine learning goes hand in hand with artificial intelligence. It is the ability of a program to evaluate a set of algorithms, and 'learn' from them and then replicate those algorithms when needed. It has revolutionized the world in many sectors such as health, education, technology, military, and automation. It has taken a position to be applied in those sectors with the help of advanced algorithms to assist humans with their tasks. A popular example is OpenAI's ChatGPT, which is a language model, and incorporates machine learning to learn from the conversations it has with its users. In addition, 'Elevenlabs' has an artificial intelligence model which can convert text to speech with the option of different voices and accents. Midjourney is a picture making model which can develop any picture on demand.

d) → RAM and ROM

RAM is known as 'random access memory', and is a form of computer memory that can be read and changed in any order, whereas ROM, 'Read only memory' is a kind of non-volatile memory that cannot be changed. A few differences include that RAM is more expensive than ROM, and has a higher access and read speed than ROM. Moreover, RAM has higher storage than ROM, and the data stored in the RAM is accessed by the central processing unit (CPU), whereas the ROM is used to bootstrap the computer.

Q.5

a) -> Different Methods of Food Preservation

Food preservation is the act of preparing food for safe, long term storage. It is used to maintain the quality and nutritional value of the food over long periods of time. Methods of food preservation ~~include~~ include chilling, freezing, sugaring, salting, canning, and vacuum packing. Food preservation is essential to prevent the accumulation of bacteria in the food, and to prevent oxidation of the food.

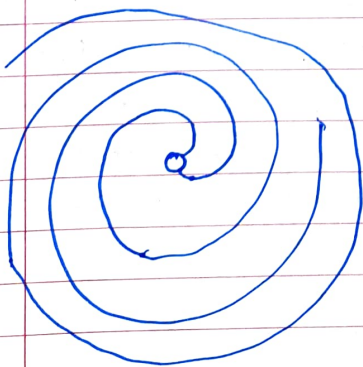
b) -> Milky Way

The Milky Way is the galaxy in which the Solar system resides. It is a spiral galaxy which has a radius of 52,850 light years.

-> Dark Matter

Dark matter is the combination of fundamental subatomic particles such as neutrinos, and antineutrinos. These particles are difficult to detect but have mass. Dark matter relates to galaxies because it is responsible for the accelerated expansion of galaxies as well as the universe.

-> Parts of Galaxies

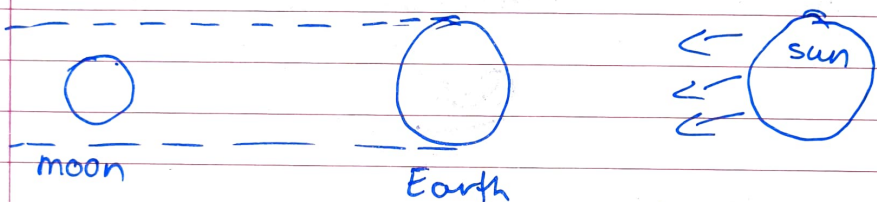
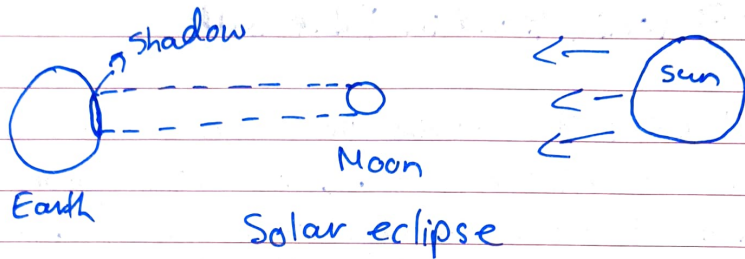


spiral galaxy

A galaxy has six parts in total. First is the nucleus, which makes up the center most area of the galaxy, then the central bulge, a disk which includes both thick and thin disk, and spiral arms along with a spherical component and a halo.

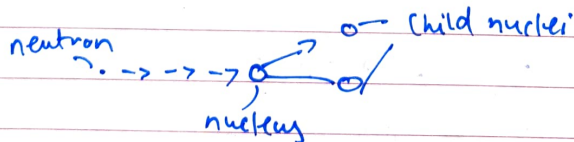
c) Lunar and Solar Eclipses

A lunar eclipse occurs when the earth is between the sun and the moon, causing earth to cast a shadow on the moon. A solar eclipse occurs when the moon passes between the sun and earth, casting a shadow on the earth.



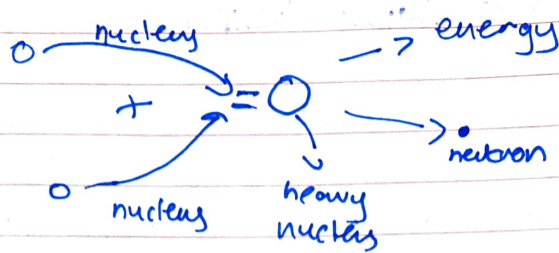
d) → Nuclear Fission

Nuclear fission is a reaction where the nucleus of an atom splits into two or more nuclei. This process is done by bombarding a nucleus with neutrons, which causes the nucleus to become unstable and split. Fission causes the production of gamma rays and also produces a large amount of energy.



→ Nuclear Fusion

Nuclear fusion is a process where two or more atomic nuclei combine to make one or more different atomic nuclei. A large amount of energy is given off during this process.



Nuclear Fusion

→ Ionic Bond in Table Salt

Table salt, contains one atom of Sodium (Na) and one Chlorine atom (Cl). These atoms form an ionic bond in which a negatively charged chloride ion bonds with a positively charged sodium ion to complete each valence shell of the atom.

Q.6

a) Candidate: ABC

A - 15000

B - 10000

C - 8000

Total votes = 33000

percentage of votes of winning candidate.

$$= \frac{15000}{33000} \times 100$$

$$= \frac{5}{11} \times 100$$

$$= \frac{500}{11} = 45.4\%$$

b) Ratios of angles = 3:4:5

sum of all angles = 180°

$$\text{Angle A} = \frac{3}{12} \times 180$$

$$= \frac{180}{4} = 45^\circ$$

$$\text{Angle A} = 45^\circ$$

Angle B

$$= \frac{41}{1 \times 3} \times 180 \text{ } 60$$

$$= 60^\circ$$

Angle B is 60°

Angle C

$$= \frac{5}{1 \times 2} \times 60 \text{ } 5$$

$$= 25^\circ$$

Angle C is 25°

c) Ratio of boys to girls

$$= 4:6$$

Boys required = ?

Girls present = 102

$$\frac{102}{4} = 25.5$$

$$4:6$$

$$x:102$$

$$= 6x = 408$$

$$6x = 408$$

$$x = \frac{408}{6} = 68$$

$$x = 68$$

$$x = 38$$

38 boys will be required

d)

Present

A : B

6 : 7

 $6n+5$ $7n+5$

$$6n+5 : 7n+5 = 6:7$$

$$\frac{6n+5}{7n+5} = \frac{6}{7}$$

$$48n+40 = 49n+35$$

$$n = 5$$

After 5 years

A : B

7 : 8

Present age of A

$$6n = 6(5) = 30$$

Present age of B

 $7n$

$$= 7(5)$$

$$= 35$$

Q.Pa) First odd number = x

$$x, x+2, x+4$$

$$x + (x+2) + (x+4) = 273$$

$$3x + 6 = 273$$

$$3x = 267$$

$$x = \frac{267}{3}$$

$$x = 89$$

Three odd numbers = $89, 91, 93$

b) i) 4, 16, 36, 64, 100, 144

ii) 30, 29, 27, 24, 20, 15

iii) 1, 7, 15, 25, 37, 51

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

v) 48, 24, 72, 35, 108, 54

c) i) Shirt

ii) Danger

iii) Stomach

iv) London

v) Holiday

d) Sara's mother 6 times older than Sara $6x$ Ali twice as old as Sara $2x$ Age of Sara = x

In 3 years time

$$(x+3) + (2x+3) + (6x+3) = 72$$

$$9x + 9 = 72$$

$$x = 7$$

Sara = 7 years

Ali = 14 years

Sara's Mom = 42 years