: General Science and ABiLity:

==(Part II)==

:(Section 1):

QNO2)—

(a)

A Volcano is simply an opening or vent on the surface of earth through which molten magma, escape on to the earth's surface.

How volcanoes are erupted?:

Volcanoes happen when magma rises to the surface of the earth, which causes bubbles of gas to appear in it. This gas cause pressure to build up in the mountain and it eventually explodes. Volcanoes can be formed in three ways.

1- Via Subduction:

The subducting slab dehydrates from new melt that

will rise through the crust to be erupted at the surface.

2- Via rifting:

When two plates pull apart magma rises, producing volcanic eruption at the surface.

3- Hotspots:

Hotspots donot necessarily occur along a plate boundary. Hotspot are hot. plumes breaching the surface in the middle of tectonic plate. So hotspot volcanoes can form in the middle of tectonic plates.

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(b)

The Big Bang theory is created or developed in 1927 and is considered the most credible scientific explanation of how the universe was created.

Big Bang was the expansion of space. Space itself a concept that comes out of Einstein's equation of general but has no counter part in the classical physics.

Big crunch is a theory that "If there's enough energy density eventually gravity will stop the expansion of the universe, and reverse it. So it collapses smaller and smaller, and there is a singularity at the end just like the one at the start.

How age of universe is determined?

Astronomers estimate the age of the universe in two ways:

1— By looking at the oldest stars.

2— And by measuring the rate of expansion of the universe and extrapolating back to the Big Bang; just as crime deactivates can trace the origin of bullet from holes in a wall.

(C)

Renewable resources are natural resources - sunlight, wind, tides, geo-thermal etc; that can be replenished in a short period of time.

Here we discuss about the five sources of Renewable energy.

1 — Wind Energy:

→ Wind energy is used to generate mechanical power.

→ Wind turbines convert K.E into mechanical power then a generator can convert it to electric energy.

→ Wind speed < 16 km/h

→ Modern utility-scale wind turbines range from 600 KW to 5 MW of rated power. although turbines without output 1.5 — 3 MW for commercial use.

2 - Hydro Power:

→ The use of falling or fast-running water to produce electricity or to power machines.

→ Hydro electric energy is usually reserved term for large-scale hydro electric dams.

→ Run-of the river hydro electric systems derive kinetic energy from rivers and oceans with out the creation of a large-reservior.

3 - Solar Energy:

→ Solar energy applies energy from the sun in the form of solar radiation for heat or to generate electricity.

→ Solar-powered electricity generation uses either photo volatics or heat engines.

4 - Biomass and Biofuel:

→ Biomass or Biofuel is a biological material derives from living or recent

living organisms:

→ In content of Biomass for energy often used to mean plant based material, but biomass can equally apply to both animal and vegetable dvived material.

5- Geothermal Energy:

→ Hot water and steam from deep underground can be used to drive turbines. This is called geothermal energy.

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(d)

Optical fibre is a strands of optically pure glass as thin as a human hair that carries digital information over long distances.

Working Principle:

Optical fibre works on the principle of total internal reflection

→ Total internal reflection to get maximum reflection.

→ Total reflection minimize the consumption of energy.
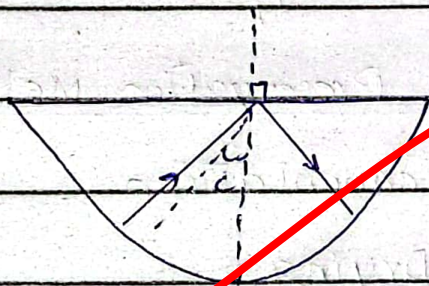
→ Signal can travel long distance with less energy.

fig: Total internal reflection.

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QNO$)—

(a)

Food preservation is a process of treating and handling of food to stop or greatly slow down spoilage caused or accelerated by micro-organisms.

Food Preservation Methods:

1- Modern Preservation methods:

→ Canning process of preserving food by heating and

sailing it in containers for storage.

→ Dehydration — Sundry, Oven dry dehydrates.

→ Freezing — Containing environment, where bacteria cannot grow.

2 - <u>Ancient Preservation Method:</u>

→ Fermentation

→ Drying

→ Curing (SALT).

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(b)

Milky way:

Milkyway is the large, disk-shaped galaxy that includes in our solar system.

→ It is a spiral galaxy.

→ It has a diameter of 100,000 to 180,000 Lightyears.

→ Containing about 100-400 billion stars making it a giant galaxy.

→ It is a home to our solar system.

→ The solar system is stationed in the orion-cygnus arm of the galaxy.

Darkmatter:

Dark matter is related to galaxies in such a way that dark matter makes up most of the mass of galaxies and galaxy clusters and is responsible for the ways galaxies are organized in grand scales.

Parts of Galaxies:

Galaxies have many arms and a center which often known as a blackhole which help the galaxy to bound all the galaxy together. Our solar system is located in the orion cygnus arm of the galaxy.

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(c)

An eclipse is an astronomical event in which one astronomical object is temporarily obscured either by passing into the shadow of another body or having another body pass between it and the viewer.

Eclipse are of two types.

○ **Solar Eclipse:**

→ Solar eclipse occurs when the moon is between the sun and the earth and its shadow moves across the face of the earth.

→ Solar eclipse always occur at the time of new moon.

○ **Lunar Eclipse:**

→ Lunar eclipse occurs when the earth is between the sun and the moon and its shadow darken the moon.

→ Lunar eclipse would always

occur when moon is in full-moon phase.
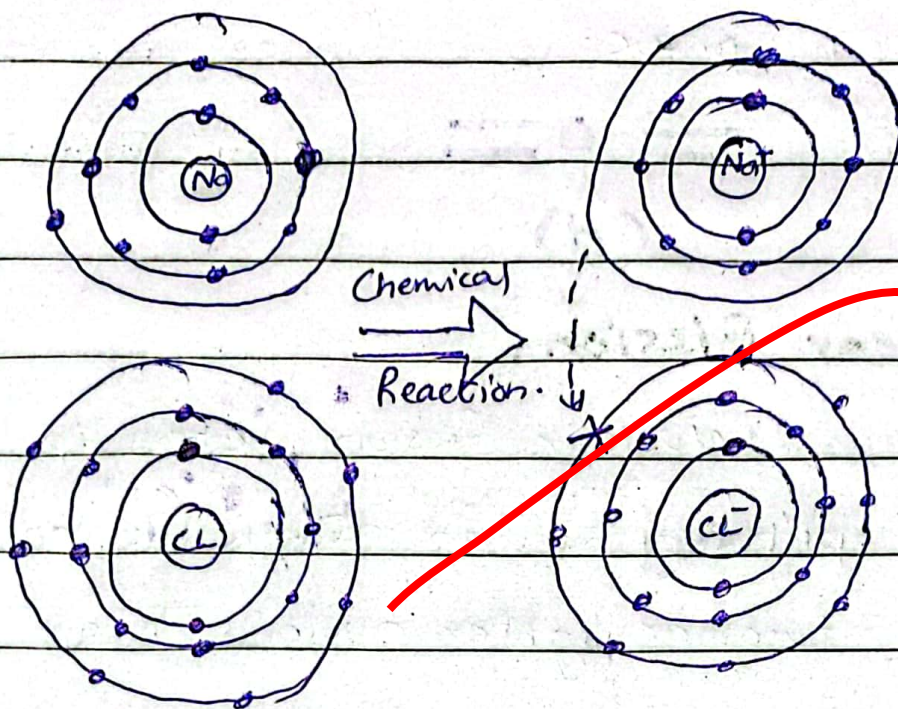
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(d)

Nuclear Fission:

Nuclear fission refers to the splitting of an atomic nucleus into two or lighter nuclei. This process can occur through a nuclear reaction or through radio active decay.

Nuclear fission reaction often release a large amount of energy which is accompained by the emission of neutrons and gamma rays.

Nuclear Fusion:

In nuclear fusion reaction, at least two atomic nuclei combine/fuse into a single nucleus. Subatomic particles such as neutrons or protons are also formed as products in these reaction.

Ionic bond in a table salt:

Chemical
Reaction.

A table salt is also known as sodium chloride. An atom of sodium donate one of its electron to an atom of chlorine (cl) in a chemical reaction, and the resulting positive ion (Na$^+$) and negative ion (cl$^-$) form a stable ionic compound (sodium chloride: common table salt) based on this ionic bond.

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:(Section II):

QNO 8):

(a)

First let's name the three consecutive odd integers.

We can call the first integer i.

So, they are consective odd integers so we add 2 and 4 to the first integer.

Therefore, integers are:

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

$$3i + 6 = 273$$

$$3i = 273 - 6$$

$$i = \frac{2687}{3}$$

$$\boxed{i = 89} \rightarrow \textcircled{1}$$

So put this value of i in other

$$\cdot 2 \; i + 2$$
$$= 89 + 2 \quad = 91 \rightarrow \textcircled{2}$$

$$\xi \cdot 2 \; i + 4$$
$$= 89 + 4 \quad = 93 \rightarrow \textcircled{3}$$

So, the three consective integers are

$$89, 91, 93$$

$$= 0 =$$

(b)

1- 4, 16, 36, 64, ?, 144

To find the missing number, we realized that the given series of numbers is the square of even numbers. as

$$4, \quad 16, \quad 36, \quad 64, \quad 100, \quad 144$$
$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$
$$2^2 \quad 4^2 \quad 6^2 \quad 8^2 \quad 10^2 \quad 12^2$$

So, the missing number is 100

2- 30, 29, 27, ?, 20, 15

To find the missing number, we realized that the given series of numbers is subtracting the numbers by sequence like, -1, -2, -3

so,

$$30, \quad 29, \quad 27, \quad 24, \quad 20, \quad 15$$
$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$
$$-1 \quad -2 \quad -3 \quad -4 \quad -5$$

So, the missing no is 24

3- 1, 7, 15, 25, ?, 51

To find the missing the missing number, we have realized that the given series is a sum of even numbers starting from 6, so

$$1 , 7 , 15 , 25 , 37 , 51$$

$$\downarrow +6 \quad \downarrow +8 \quad \downarrow +10 \quad \downarrow +12 \quad \downarrow +14$$

4 - 0, 2, 6, 12, 20, 30, ?

To find the missing number we have realized that the given number is a sum of even numbers starting from 2, so

$$0 , 2 , 6 , 12 , 20 , 30 , 42$$

$$\downarrow +2 \quad \downarrow +4 \quad \downarrow +6 \quad \downarrow +8 \quad \downarrow +10 \quad \downarrow +12$$

5 - 48, 24, 72, 35, 108, ?

To find the missing number we have realized that the given series is a sequence of the first number is the double of second and as we move forward, an even number started from 2 adding to the double of values. so.

$$48 , 24 , 72 , 35 , 108 , 52$$

24+24+0   35+35+2   52+52+?

So the required number is $\boxed{52}$.

$$= 0 =$$

(C)

Jumbled Word	Correct Word
1- THRSI	SHIRT
2- GNDREA	Danger
3- SCHAMOT	STOMACH
4- ONLNDO	LONDON
5- HIODALY	HOLIDAY

= o =

(D)

Let the age of Sara be x

Her mother age is $6x$

Ali's age is $2x$

In three years time, their ages would be:

Sara's age = $x + 3$

Mother's age = $6x + 3$

Ali's age = $2x + 3$

So, the sum of their ages will be 72 after 3 years.

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

$$9x + 9 = 72$$

$$9x = 63$$

$$x = 7, \text{ which is Sara's age}$$

mother's age = $6x = 6(7) = 42$

Ali's age = $2x = 2(7) = 14$

So, Sara's age is 7, mother's age is 42 and Ali's age is 14

QN06)-

(a)

Total voters = $10000 + 8000 + 15000$

= ~~16000~~ 33000

votes recieved by contestant 1 = 15000

" " by contestant 2 = 10000

" " by contestant 3 = 8000

so the winning candidate is

contestant 1 so, the percentage

can be calculated by given formula

$$\frac{\text{votes recieved}}{\text{Total no of votes}} \times 100$$

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

$$= \frac{1500}{33} = 45.45\%.$$

$$= 0 =$$

(b)

Angles are in the ratio of $3:4:5$

let the angles be $3x, 4x, 5x$

$$3x + 4x + 5x = 180$$

$$12x = 180$$

$$\boxed{x = 15}$$

Hence the angles are $45°, 60°, 75°$

(c)

Ratio and proportion of boys to girls:

$$4:6 = n:102$$

To find n, we use mean-extreme property of proportions, then simplify.

$$4:6 = n:102$$

$$4 \times 102 = 6 \times n$$

$$408 = 6n$$

$$n = \frac{408}{6}$$

$$\boxed{n = 68}$$

Therefore, 68 boys required for such grouping.

=== 0 ===

(d)

The ratio between the present age is 6:7

After 5 years, the ratio become 7:8

So $(6x+5)/(7x+5) = 7/8$

$$48x + 40 = 49x + 35$$

$$48x - 49x = 35 - 40$$

$$-x = -5$$

$$\boxed{x = 5}$$

Present age of A $6 \times 5 = 30$
Present age of B $7 \times$