

Increase length
Keep length equal for all answers
Good for math portion

GSA mock
Part - II

SECTION - I

Question no: 5.

Part (a):

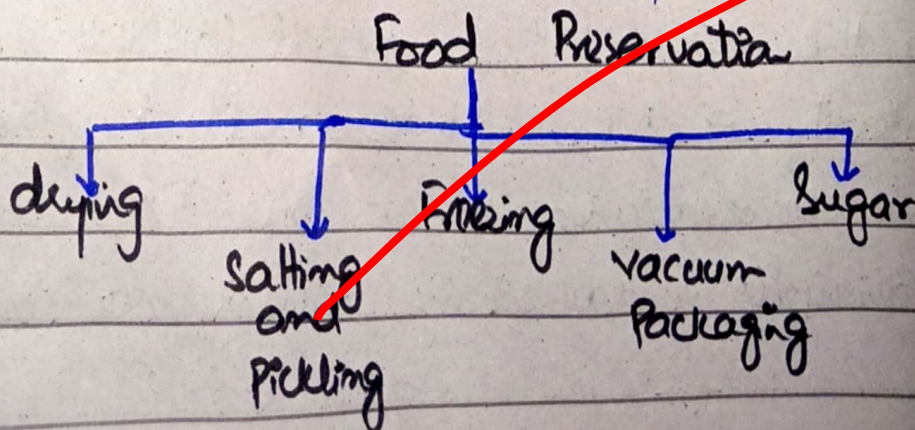
Food Preservation:

Food preservation is a technique employed for the preservation of food to prevent it from decaying, thus allowing it fit for future use.

• Food preservation ensures that quality, edibility and nutrition value of the food remains intact. It also prevents the growth of bacteria, fungi, and other microorganisms to reduce rancidity.

• Methods of food Preservation:

Various methods employed for food preservation which are as follows:



(i) Drying:

It is the oldest method of food preservation, that reduces the ~~water content~~ in food, thus prevents the growth of microorganisms. Sun and wind are both used for drying.

Meat and fruits like apricots, apples etc are some examples of drying with this method.

(ii) Freezing:

Freezing is keeping prepared food stuffs in cold storages.

(iii) Vacuum Packaging:

Vacuum packaging creates vacuum by making bags and bottles airtight. \rightarrow Since there is ~~no oxygen~~, in the created vacuum, bacteria die.

\rightarrow It is usually used for dry fruits.

(iv) Salting and pickling:

Salting \Rightarrow removes moisture from food and pickling means preserving food in brine (salt solution) or marinating in vinegar.

Salt kills and inhibits the growth of microorganisms at 20% of concentration.

(v) Sugar:

Sugar is used in syrup form to preserve fruits or in crystallized form if the material to be preserved is cooked in the sugar.

It is also used to preserve luxury goods like fruit in grape brandy.

(vi) Canning and bottling:

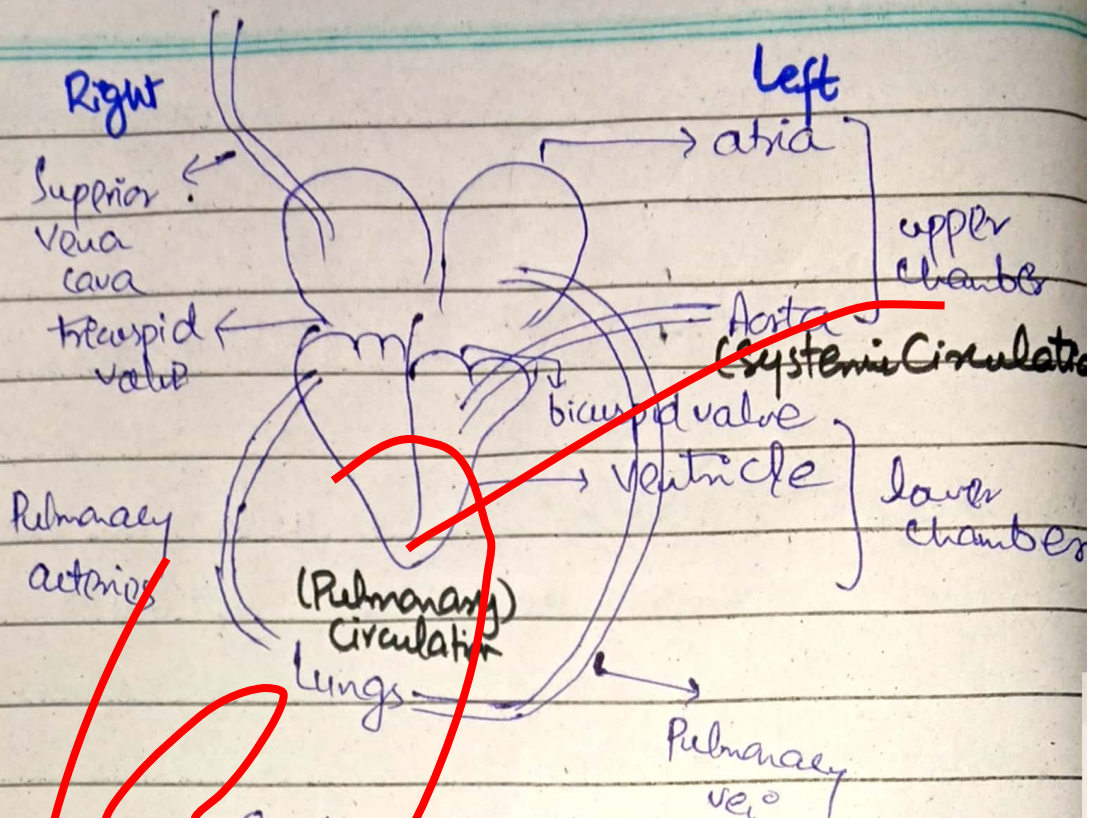
It refers to sealing cooked food in sterile bottles and cans. The container is boiled and thus kills the microorganisms. Once a bottle is opened, the food is again at the risk of spoilage.

(b) Part (b):

Human Heart:

Working of human heart in blood circulation:

Human heart composed of 4-
members →
→ upper chambers called atria
↓
lower chambers called ventricle



Two types of blood circulation -

Pulmonary Circulation

Systemic Circulation

1. In pulmonary circulation, the right atria receives deoxygenated blood from upper body parts through vena cava.

Atria contract → tricuspid valve open

↓
Blood goes to right ventricle

From right ventricle, ~~at~~^{on} contraction, transfer blood to pulmonary arteries.

Pulmonary arteries, carrying deoxygenated blood, to lungs which upon oxygenation carried by pulmonary vein.

Pulmonary vein, carrying oxygenated blood to the left atria. This constitutes pulmonary circulation.

2. Systemic Circulation:

On contraction of left atria, blood transfers to left ventricle followed by opening of bicuspid valve. From left ventricle, large aorta arises that supplies blood to the rest of the body. (oxygenated)

Left atria → bicuspid valve → left ventricle

↓
Body ← Aortic arches ← aorta
System

Part (C):

Solar Eclipse

Lunar Eclipse

§

Definition

Solar eclipse occurs when a moon passes in between the earth and the sun.

Lunar eclipse occurs when the ~~moon~~^{earth} passes through the moon and the sun.

Occurrence

Solar eclipse occurs once in 18 months and

It occurs two times in a year and during

day time.

night time

Duration

Solar eclipse lasts for about 7 minutes.

Lunar eclipse lasts for an hour.

Moon phase

Solar eclipse happens in a new moon phase.

Lunar eclipse happens when the moon is in its full moon phase.

Visibility

Solar eclipse can be seen through the naked eye, but it can harm the vision.

Lunar eclipse can also be seen through the naked eye, but it is harmless.

Shadow

During solar eclipse, a small area on Earth will be covered with moon's shadow.

During lunar eclipse, the entire moon will be covered by Earth's shadow.

Diagram of solar eclipse:

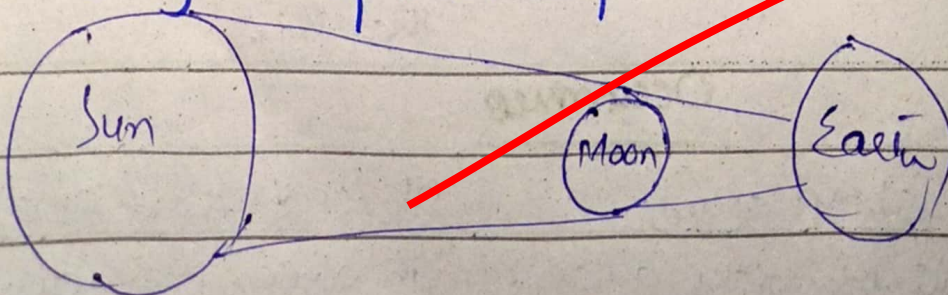
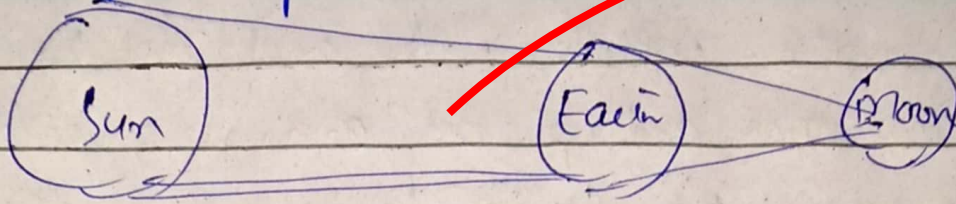


Diagram of lunar eclipse.



Part (d):

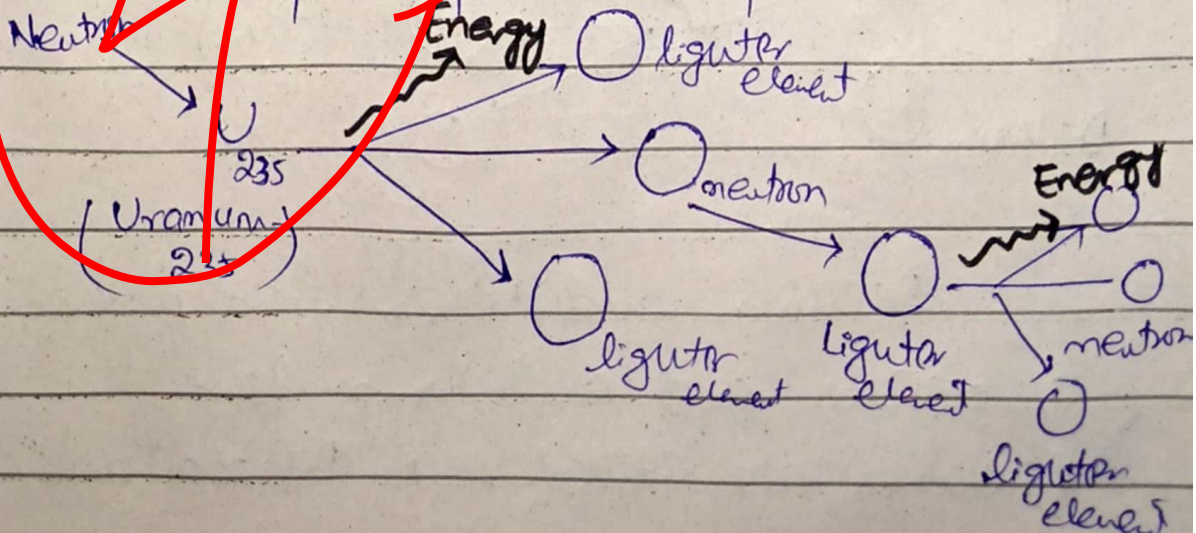
Nuclear Fission:

Nuclear fission is the process of splitting a nucleus in two small nuclei, with the release of large amount of energy.

Some of the energy is in the form of radiation, but most of the energy is in the form of kinetic energy.

The energy thus produced, is a source of heat which is used to generate steam, and creates electricity.

Nuclear fission process is as follows:



A neutron collides with and splits the Uranium atom, emitting an enormous amount of energy in the form of heat and radiation.

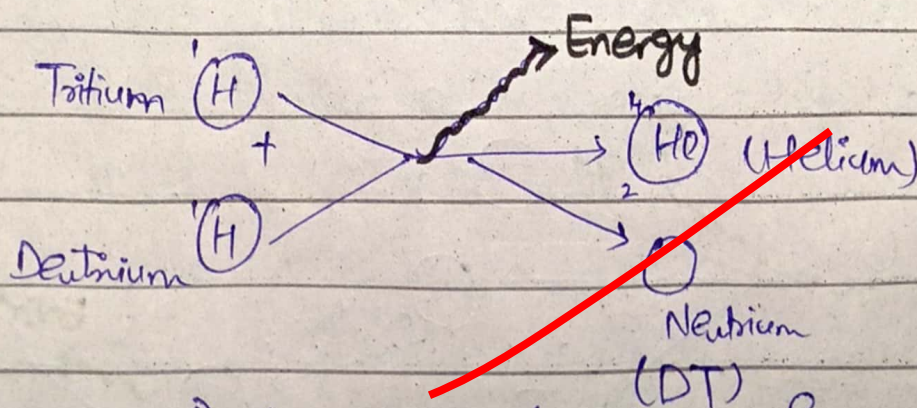
Applications:

- Controlled fission is being applied in nuclear reactors to make clean electricity
- Atom bombs are based on the uncontrolled fission reaction.

(ii) Nuclear Fusion:

Nuclear fusion, two light ^{atomic} nuclei combine to form a heavier nucleus.

In 1920s, Arthur Eddington proposed that stars get their energy from the fusion of hydrogen and into helium.

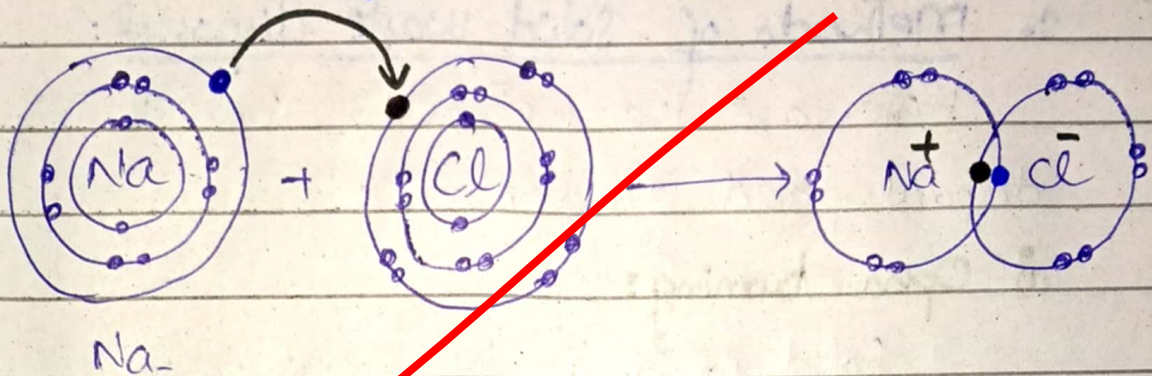


Deuterium and tritium fusion produces a neutron and a helium nucleus.

Researchers are interested in DT reactions

because they produce a lot of energy and take place at low temperature than other elements.

Ionic bonding in Salt:



An atom of Sodium (Na) donates one of its electrons to an atom of Chlorine (Cl) in a chemical reaction, thus resulting positive ions (Na^+) and negative ions (Cl^-) form a stable ionic compound based on ionic bonding.

Question no : 04

Part (a) :

Solid waste management:

Solid waste management refers to the process of collecting and treating solid wastes, into less toxic and disposable form.

Improper disposal of solid waste can create unsanitary conditions, and these conditions in turn lead to pollution of the environment.

1. Methods of solid waste disposal:

Here are the methods of solid waste disposal and management.

(i) Open burning:

Solid waste is burnt openly in an open area/land at high temperature.

(ii) Fermentation or biological digestion:

Biodegradable wastes are converted to metal compact and recycling can be done whenever possible.

(iii) Waste compaction:

The waste material such as cans and plastic bottles are compacted into blocks and sent for recycling. This process prevents the oxidation of metals and reduces air space needs.

(iv) Vermicomposting:

It is the process of using worms for the degradation of organic matter into nutrient-rich manure. Worms consume and digest the organic matter.

(v) Landfills:

In this process, the waste that cannot be reused or recycled are separated out and spread as a thin layer in low-lying areas across a city. A layer of soil is added after each layer of garbage.

Part (b):

Milky Way:

The Milky Way is a huge collection of stars, dust and gas. It's called a spiral galaxy because if viewed from top or bottom, it would look like a spinning wheel.

→ The sun is located in one of the spiral arms.

Like other spiral galaxies, our galaxy has a disk, a central bulge and spiral arms. Because of its milky-white appearance, it's named as a milky way.

Dark matter:

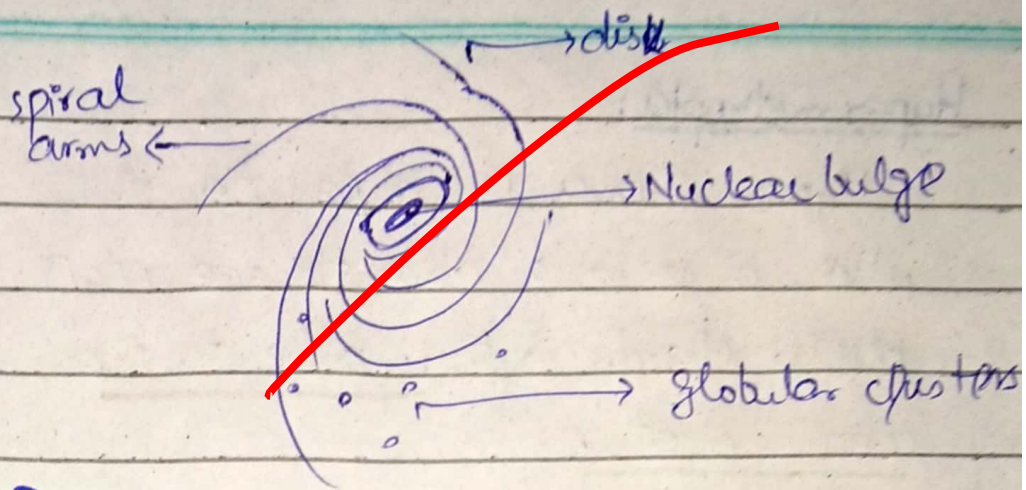
Spiral galaxies are surrounded by mixture of old stars, star clusters, halos and dark matter.

Dark matter is the invisible material that does not emit or reflect light but still has a gravitational pull on other matter. Dark matter holds the galaxies together, makes up most of the mass of galaxies and galaxy clusters, and is responsible for the way galaxies are organized on grand scale.

Parts of galaxies:

These are four main components to a galaxy:

- ↳ disk
- ↳ Spiral arms
- ↳ Central bulge
- ↳ Centre/black hole

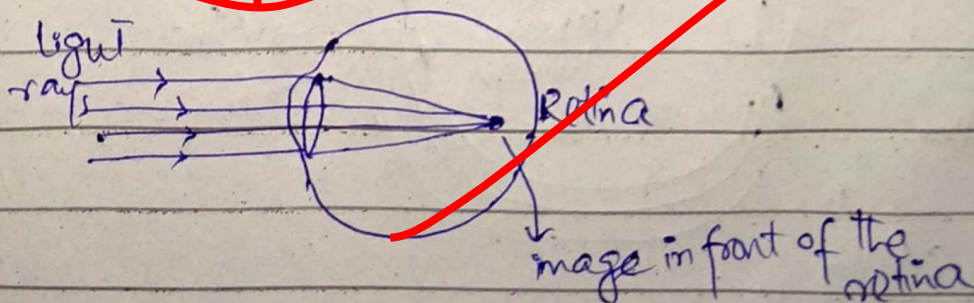


Part (c):

Myopia:

"Myopia is a condition in which a person is able to see near objects clearly, but unable to see distant objects."

- It is also called as nearsightedness.
- It happens when the eyeball is elongated and image is formed in front of the retina.
- By using convex lens of a suitable focal length, it can be corrected.



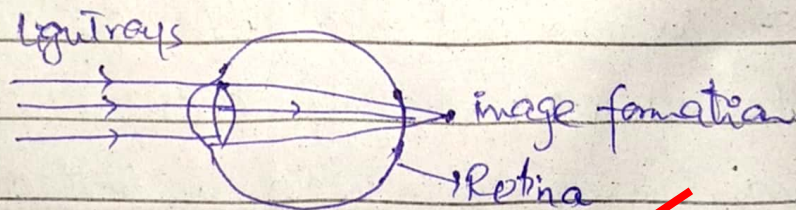
Hypermetropia:

Hypermetropia is a condition in which a person is able to see distant objects clearly but unable to see near objects.

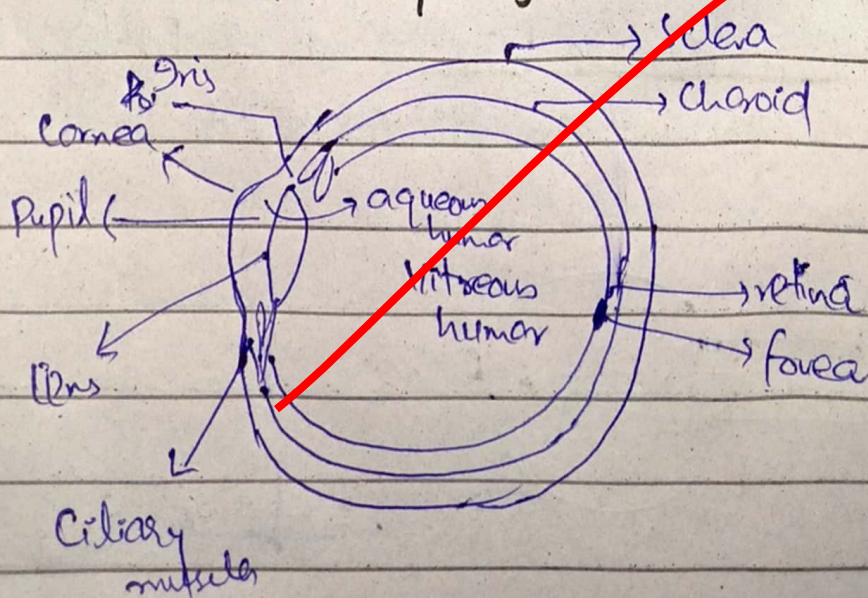
It is also called as farsightedness.

→ It happens when the eyeball gets shortened and image is formed behind the retina.

→ By using concave lens of a suitable focal length, it can be corrected.



major parts of eye:



Part (d):

Uses of microwaves:

Microwaves are the ^{electromagnetic} radiations that ranges between 300MHz to 300GHz . They fall in between the infrared and radiowaves in the electromagnetic spectrum.

- Microwaves obey the laws of reflection and refraction. These properties of microwaves are used in communication systems.
- Microwaves are used in radar systems for the location of distant objects like ships, air planes.
- Microwaves are used in the study of atomic and molecular structures.

Uses of ultraviolet:

- UV radiations can be used for tanning and hardening various dental filling types.
- UV lamps in hospitals to sanitize surgical supplies.
- It is used for sterilising, disinfecting and killing bacteria and viruses.

Section - II

Question # 08:

Part (a):

Let the three integers are;

$$a, a+2, a+4 \quad \text{--- eq (1)}$$

$$\text{Sum of three integers} = 273$$

To find value of one integer (a):

$$a + a + 2 + a + 4 = 273$$

$$3a + 6 = 273$$

$$3a = 273 - 6$$

$$3a = 267$$

$$a = \frac{267}{3} = 89$$

$$a = 89$$

Putting the value of 'a' in eq (1) to find the value of other integers;

$$a+2 \Rightarrow 89+2 = 91$$

$$a+4 = 89+4 = 93$$

So, the value of three integers is;
89, 91 and 93.

Part (b):

i) 4, 16, 36, 64, ?
↓ ↓ ↓ ↓ ↓
 2^2 4^2 6^2 8^2 10^2

In the above series, numbers arranged are square of consecutive even numbers. So, the 5th number will be 100.

ii) 30, 29, 27, ~~24~~, 20, 15
↖ ↖ ↖ ↖ ↖
-1 -2 -3 -4 -5

29 is one less than 30, 27 is two less than 29, so the missing number be 3 less than 27, so it will be 24.

iii) 1, 7, 15, 25, ~~?~~, 51
↖ ↖ ↖ ↖ ↖
+6 +8 +10 +12 +14
37

In above series, each number is the difference of addition of even number. The difference between 1 and 7 is 6. The difference between 7 and 15 is 8 and between 15 and 25 is 10. So the next n^{br} obtained is will be addition of 12. Missing number is 37.

(iii) 0, 2, 6, 12, 20, 30, 42

$\begin{array}{cccccc}
\curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright \\
+2 & +4 & +6 & +8 & +10 & +12
\end{array}$

In above series, each number obtained is the addition of next even number, so the missing number obtained will be the addition of +12. Missing number is 42.

(iv) 48, 24, 72, 35, 108, ?

$\begin{array}{cccc}
\swarrow & \searrow & \swarrow & \searrow \\
\times 2 & \times 3 & \times 2 & \times 3 + 3 \\
+2 & & &
\end{array}$

48, 24, 72, 35, 108, 52 ?

$$48/2 = 24 \times 3 = 72$$

$$\frac{36}{72} = 2 \quad 35 \times 3 = 105 + 3 = 108$$

$$36 - 1 = 35$$

$108/2 = 54 - 2 = 52$

above series is the division of a number by '2' and multiplication by '3'. In division, 1 is subtracted, and in multiplication +1 is added. missing number is 52.

Part (c):

- i) Shirt ii) Garden iii) Stomach
iv) London v) Holiday

Part (d):

Let the Sara's age = x

Sara's mother age = $6x$

Ali's age = $2(x)$

In three years, sum of the ages = 72

So, Sara's age = $x+3$

The sum of the ages:

$$x + \text{Sara's age} + \text{Ali's age} + \text{Sara's mother's age} = 72$$

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

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

$$9x+9 = 72$$

$$9x = 72-9$$

$$9x = 63$$

$$x = 7 \text{ years}$$

Sara's age is 07 years.

Sara's mother age = $6(7) \Rightarrow 42$ years

Ali's age = $2(7) = 14$ years.

Question (06):

Part (d):

Ratio of present ages of A and B = 6:7

$$\frac{A}{B} = \frac{6}{7}$$

after ~~5~~ 05 years, ratio becomes 7:8

$$\frac{6x+5}{7x+5} = \frac{7}{8}$$

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

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

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

$$x = 5$$

Present age of A = $6x = 6(5) = 30$ yrs

Present age of B = $7x = 7(5) = 35$ yrs.