

Section-I

Q No# 4

a)

Solid Waste Management:

Solid waste management is the collection of waste material from generation points to the ~~store~~ recovery point, then to the disposal point.

There are three stages of solid waste management,

- 1) Collection
- 2) Recovery
- 3) Disposal

Collection of solid waste:

The first step employed in the process of solid waste management is the collection of solid waste from its point of generation. Adequate staff and vehicles are required for optimum collection of solid waste.

Recovery of solid waste:

The next step in the process of solid waste management is the recovery of the solid waste. The processes involved in recovery are reuse, recycle, and recovery. In this process, useful materials are separated and used for beneficial purposes i.e. biofuel, recycling etc.

Disposal of solid waste:

It is the process in which solid waste is collected from the recovery point and disposed off in the area far from the cities and populated areas.

Following are the methods used for the disposal of solid waste;

- 1) Land filling
- 2) Incineration
- 3) Composting

Land filling:

Land filling is one of the methods used for the disposal of solid waste. In this method, a piece of land is dug and the waste material is disposed in it.

Incineration:

Incineration is the method in which solid waste is burnt in the areas far off from the cities. It is a harmful method, as it emits dangerous gases i.e. CO_2 , CO , NO_x , SO_2 , which are harmful for humans, animals and overall environment.

Composting:

Composting is the method in which waste material is dumped off in the land into various layers. It is a safe method for solid

waste management. It inflicts minimum damage to the environment.

(b)

~~Ex~~ Blood Circulation in Human Heart:

Human Heart:

Heart is one of the essential organs of human body. It helps in pumping of oxygenated blood towards body and deoxygenated blood towards the lungs for purification.

Parts of Human Heart:

1. Right Atrium
2. Right ventricle
3. Left atrium
4. Left ventricle
5. Aorta
6. Pulmonary trunk
7. Bicuspid valves
8. Tricuspid valves
9. Interventricular septum

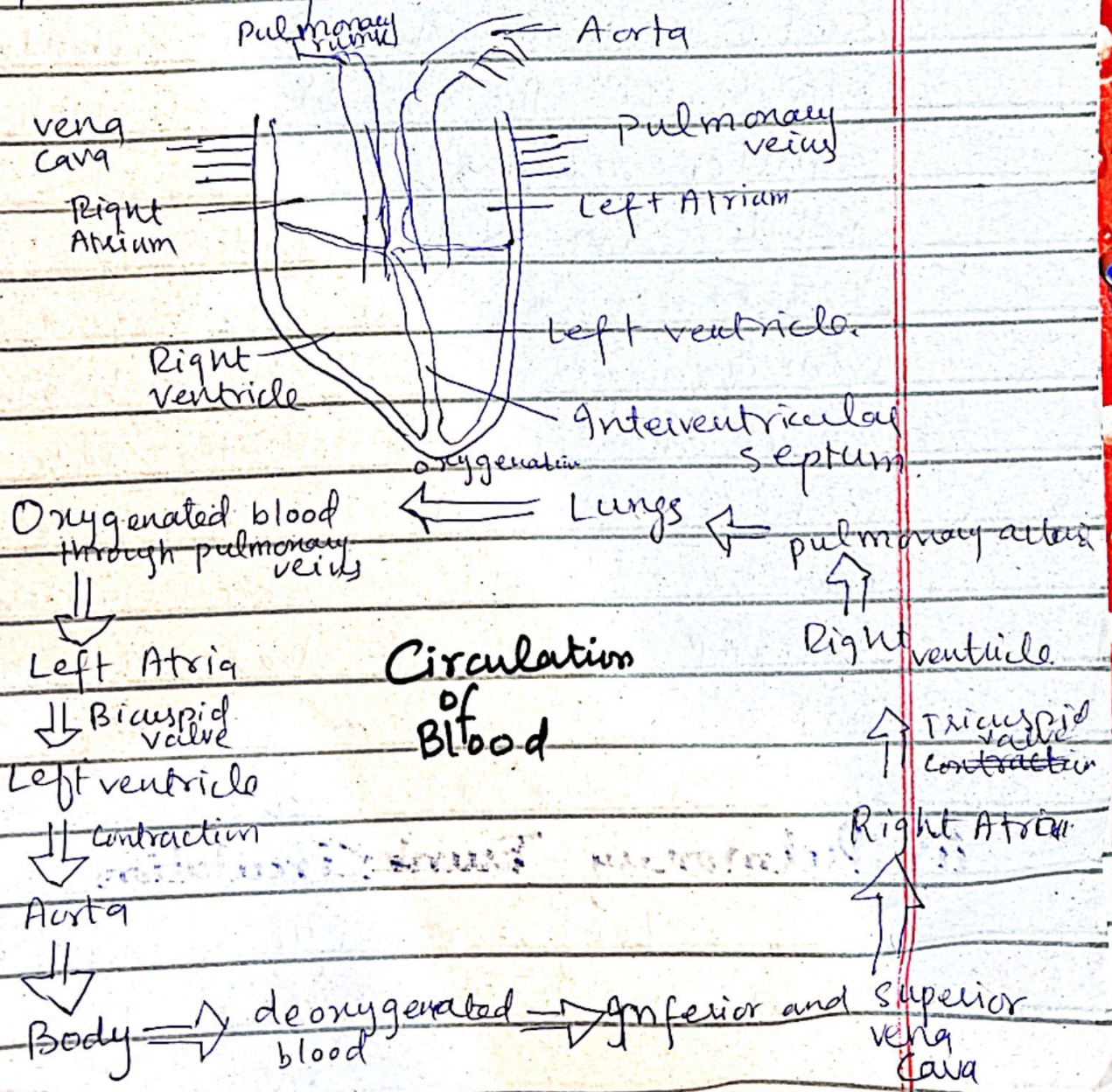
Blood Circulation in

Human Heart

Human heart is involved in the process of blood circulation in the body.

Blood circulation in human body is completed in two steps i.e.

- i) Systemic Circulation
- ii) Pulmonary Circulation



A

i) Systemic Circulation:

The left part of the heart is associated with the oxygenated blood. Left atria receives oxygenated blood from the pulmonary veins. It contracts and blood is moved through bicuspid valves to the left ventricle. When left ventricle contracts, blood is pushed to the aorta, which then distributes blood to the body through smaller arteries.

While, the right side of the heart i.e. right atria receives deoxygenated blood through vena cavae and pushed it to right ventricle through Tricuspid valves. Right ventricle undergoes contraction and pushed the blood to pulmonary trunk.

ii) Pulmonary ~~Trunk~~ Circulation:

Lungs are the organs involved in the purification

oxygenation of blood. Pulmonary arteries transfer the deoxygenated blood from the right side of heart to the lungs, where process of oxygenation takes place. The pulmonary veins, then take this blood to the left atria where the oxygenated blood is transferred to the body through aorta and smaller arteries.

Double Circulation:

Systemic and pulmonary circulation, in which two types of circulation are taking place side by side i.e. deoxygenated blood is transported to the lungs and oxygenated blood is transported to the body. This makes up the double circulation.

(C)

Myopia and Hyperopia:

Myopia and Hyperopia are the eye disorders in which the convex lens of the human eye fails to make the image on the retina.

Myopia:

Myopia is the eyesight disorder in which the convex lens of human eye forms the image in front of the retina.

⇒ Nearsightedness → near objects are seen clearly while far objects are blue.

Causes:

- Genetic
- Idiopathic
- Excessive strain on eyes

Treatment:

- Corrected through concave lens
- Corrective surgeries can be performed i.e. LASIK, LASEK

Hyperopia;

Hyperopia is the eyesight disorder in which far the lens of eye far makes the image behind the retina.

⇒ It is far-sightedness in which far objects are clear while near objects are blur.

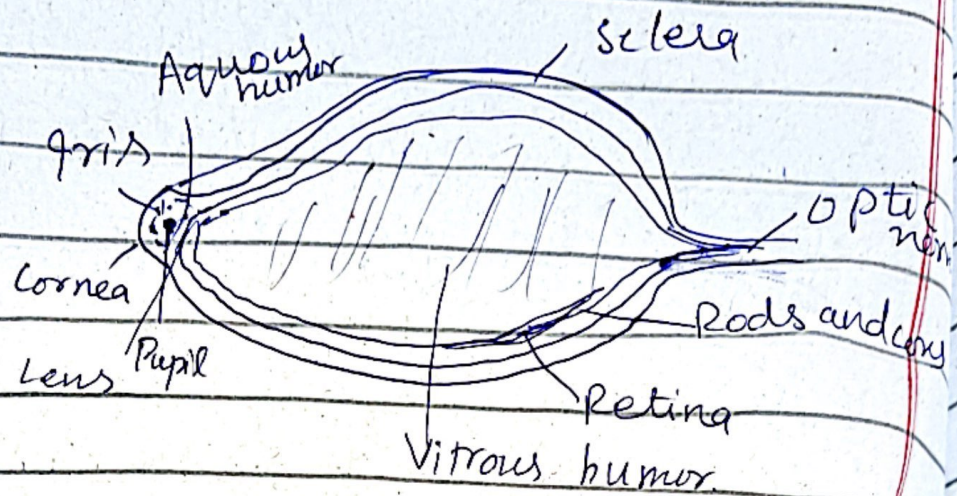
Causes:

- Idiopathic
- Aging
- Cataract.

Treatment:

- Convex lens is used to correct
- Laser surgeries can be performed
- LASIK surgery.

Parts of Human Eye:



1. Cornea → covering of eye from the front side.
2. Sclera → the white part of eye and outer covering on the back side.
3. Iris → pigmented part of the eye.
4. Pupil → helps in seeing.
5. Lens → forms the image.
6. Retina - contains the rods and cones cells.
7. Aqueous and vitreous humor - provides nutrition and lubrication.
8. Optic nerve → signal to the brain.

(d)

i) Microwave:

Microwaves are used in

i) Microwave ovens

ii) used by traffic police

ii) Ultraviolet

• used in construction of buildings.

- deplete the ozone layer.

iii) X-rays:

X-rays are used in

• ~~to~~ to visualize different parts of human body

- Bones are visualized through x-rays.

- used to study the arrangement of atoms in different materials

Q NO# 5

(a)

Preservation:

Preservation is the method in which food products are preserved i.e. their quality and self life is (changed) enhanced through usage of different methods.

⇒ Process of preservation can increase the shelf life of food products upto months.

Methods of food preservation:

Following are the methods used for the preservation of food,

1) Heating:

Heating is the method of food preservation in which a food product is heated above its boiling temperature. It kills all the microorganisms in it. It then preserves the

food. However, it is not a long-lasting method.

2. Freezing:

The method of food preservation i.e. freezing involves the cooling of food until temperature of $0-4^{\circ}\text{C}$. It denatures the enzymes of microorganism and its shelf life of food product is increased. Care must be taken while de-freezing the item.

3. Salting:

It is the method used in ancient times for the preservation of food. In this method, salt is rubbed on the meat which then disrupts the pH of the food. The disturbance of pH kills the microorganism and food is stored for a time being.

4. Pasteurization:

Pasteurization is the method used for the preservation and killing of microorganisms in the milk. In this process, milk is heated at 62°C for 30 minutes or at 100°C for 15 minutes.

5. Drying:

Drying is the method in which the food item is dried under the sunlight. Due to dryness and lack of moisture, the microorganisms are killed and food can be stored.

6. Acids and chemicals:

Different acids and chemicals can be used to preserve the food. As, acids are low pH, so they can disrupt the ~~chemics~~ microorganisms.

1. Radiation

Radiations can also be used to preserve the foods. They used to disrupt the composition of microorganisms, and in this way food can be preserved for longer times.

b)

Milkyway:

1) Milkyway is the disc-shaped galaxy which contains our solar system.

=> It is a disc shaped

=> Dense in centre

=> Bulge from the sides

=> Contains stars, interstellar remnants of stars, dark matter.

Dark Matter relation with galaxies:

Dark matter give the extra gravitational force to the galaxies. Scientists observed that the galaxy rotate with

such high speed that the gravity is not enough to hold them together. Therefore, dark matter provides extra gravitational force to the galaxies which hold them together.

Parts of Galaxy:

- Stars
- Interstellar remnants
- Asteroid
- dust
- Dark Matter
- Dark Energy.

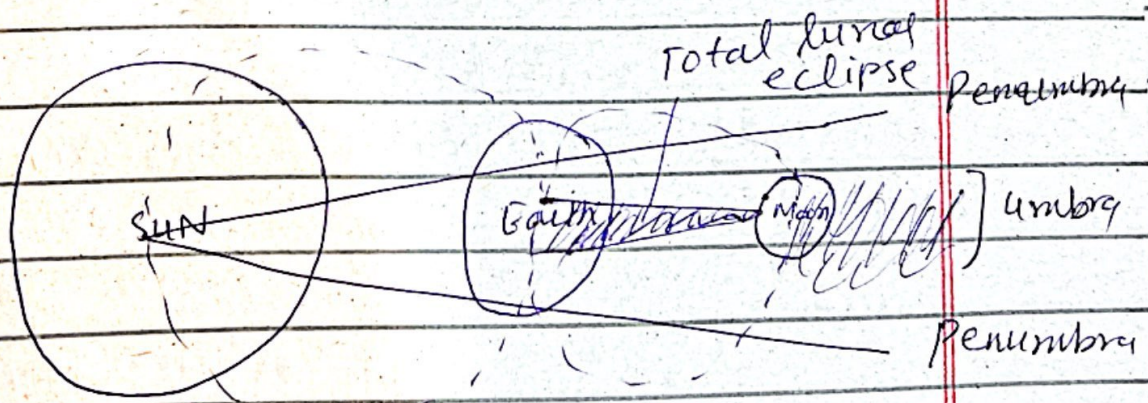
(c)

Eclipse:

Eclipse is the scientific term used when one astronomical object obscures the another.

Lunar eclipse:

Lunar eclipse is the term used when earth comes in between the sun and moon while rotating around its axis and obscuring the sunlight to moon.



Types of Lunar eclipse:

i) Total lunar eclipse:

Total lunar eclipse occurs when the sun, moon and earth are exactly aligned with

other on the central axis,

i) Umbral lunar eclipse,

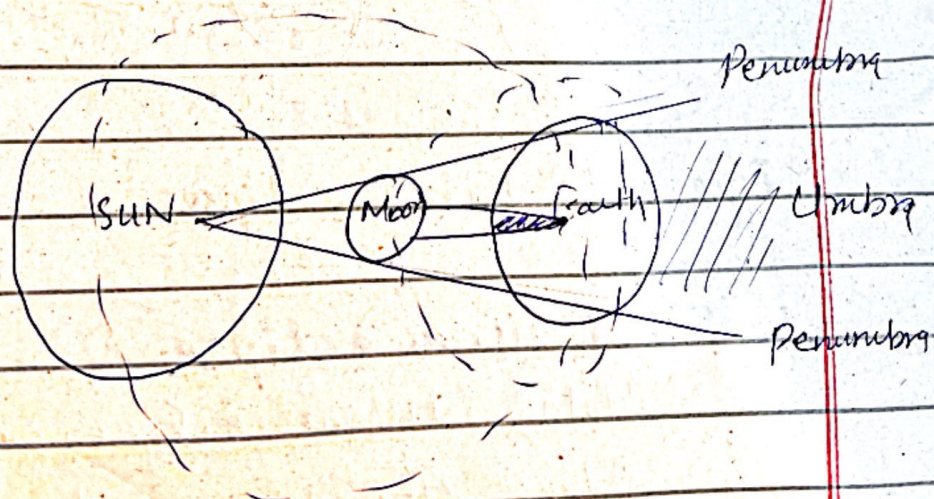
when lunar eclipse occurs in the umbral region.

ii) Penumbral lunar eclipse.

when lunar eclipse occurs in the penumbral region.

Solar Eclipse:

Solar eclipse occurs when moon comes in between the sun and Earth, while rotating around the Earth, obscuring the light to reach the Earth.



Types of Solar eclipses

i) Total solar eclipse

Total solar eclipse occurs when moon totally obscures the light from reaching the Earth.

ii) Partial solar eclipse

Partial solar eclipse occurs when moon partially obscures the light and occurs in penumbra region.

iii) Annular solar eclipse

When a small object like moon comes in between the sun and Earth, light rays from Earth gets the space to reach the Earth. Resultantly, they form the small beams like appearance called as Bail Beads appearance.

Lunar Eclipse

Solar Eclipse

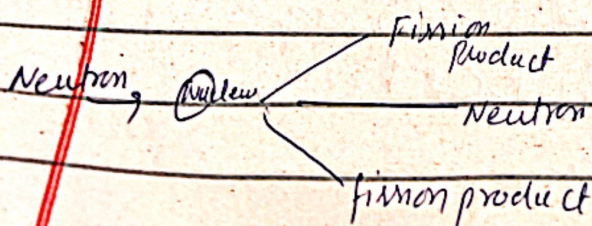
- | | |
|---|--|
| => Earth comes in between moon and Sun. | Moon comes in between the sun and the Earth. |
| => It appears at the time of full moon. | It appears at the time of new moon. |
| => safe to see at lunar eclipse. | Not safe. |
| => can be seen from the Earth. | Difficult to see. |
| => one or two times in 6 Months. | Visible every 18 Months. |

(d)

Nuclear fission Reaction:

Nuclear fission is a reaction in which a nucleus is split into two or more smaller nuclei.

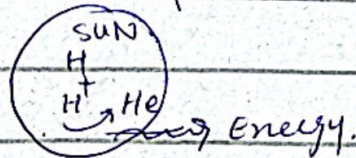
- => The fission reaction often emits gamma photons and releases very large amount of energy.



Nuclear fusion Reaction:

Nuclear fusion reaction is that in which smaller nuclei combine to form a larger nuclei and energy is released in the process.

⇒ Nuclear fusion reaction takes place in the sun, where two hydrogen nuclei combine to form Helium nuclei.



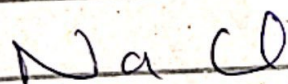
Ionic bond

Ionic bond is formed by the complete transfer of electrons from its valence shells to the another atom.

⇒ Electrostatic forces of attraction are present.

Ionic bond in salt:

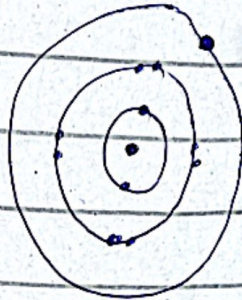
⇒ The chemical formula of salt is Sodium chloride



Na:

Sodium has one electron

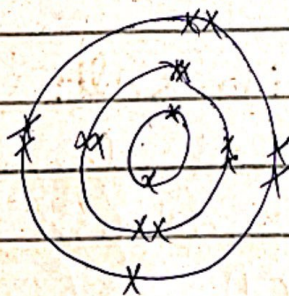
in its valence shell.
It is unstable and tends
to be stable by transferring
its outer electron.



Na

Chloride:

Chloride has total seventeen
electrons. It has seven
electrons in its outer shell.
Therefore, it tends to gain
one electron to gain stability
and adapt the octet rule.

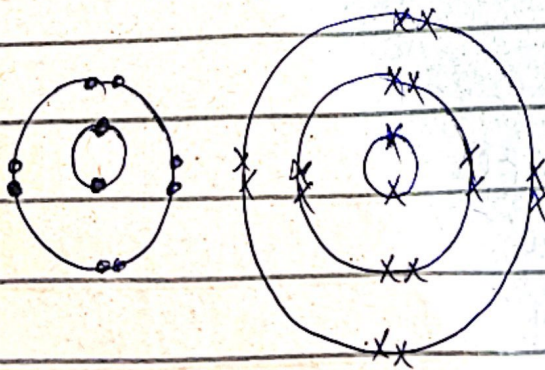
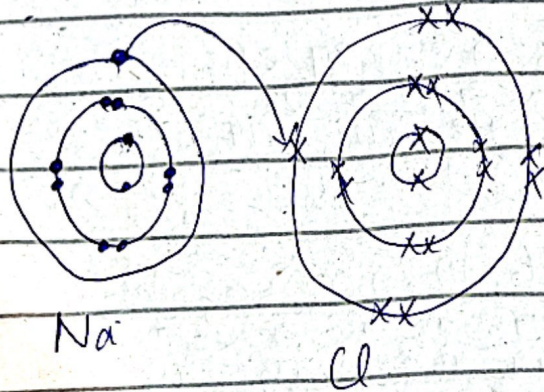


Chloride.

aCl:

When sodium and chlorine combine, sodium gives its outer electron and gain the stability and becomes Na^+ .

While, chlorine gains this electron and complete its outer shell and gain stability and becomes Cl^- .



Q NO#8

a) The odd numbers of would be,
89, 91, 93

$$89 + 91 + 93 = 273$$

b) Missing Numbers:

i) 4, 16, 36, 64, 100, 144
 2^2 4^2 6^2 8^2 10^2 12^2

ii) 30, 29, 27, 24, 20, 15
 $\xrightarrow{-1}$ $\xrightarrow{-2}$ $\xrightarrow{-3}$ $\xrightarrow{-4}$ $\xrightarrow{-5}$

iii) 1, 7, 15, 25, 37, 51
 $\xrightarrow{+6}$ $\xrightarrow{+8}$ $\xrightarrow{+10}$ $\xrightarrow{+12}$ $\xrightarrow{+14}$

iv) 0, 2, 6, 12, 20, 30, 42
 $\xrightarrow{+2}$ $\xrightarrow{+4}$ $\xrightarrow{+6}$ $\xrightarrow{+8}$ $\xrightarrow{+10}$ $\xrightarrow{+12}$

v) 48, 24, 72, 35, 108, 52

- c) i) Shirt
ii) DANGER
iii) SCAM HOT
iv) London
v) HOLIDAY

iv)

Given Data:

sum of their ages after
3 years = 72

	Present	Future
x ← Sara	x	$x+3$
y ← Ali	$2xy$	$2xy+3$
z ← Mother	$6xz$	$6xz+3$

~~$x+2x$~~

$$6x - 2x - x = 72$$

$$3x = 72$$

$$x = \frac{72}{3} = 24$$

Put $x = 24$ in $2xy + 3 = 72$

$$2(24)y + 3 = 72$$

$$48y + 3 = 72$$

$$48y = 72 - 3$$

$$y = \frac{69}{48}$$

Q NO#6

i)

Winning candidate votes = 15000

Total number of votes = 15000 +

$$10000 + 8000 = 33000$$

$$\text{percentage of winning candidate} = \frac{\text{No. of votes}}{\text{Total no. of votes}} \times 100$$

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

$$= \frac{1500}{33}$$

$$= 31.5\%$$

The percentage of the winning candidate is 31.5%.

ii) Total angles in a triangle = 180

Ratios of angle = 3:4:5

Multiply by 15

$$3 \times 15 : 4 \times 15 : 5 \times 15 = 180^\circ$$

$$45 : 60 : 75$$

$$45^\circ + 60^\circ + 75^\circ = 180^\circ$$

ii) Ratio of girls to boys

$$= \frac{4}{6} = 6:4$$

$$\text{Total parts} = 6 + 4 = 10$$

$$\text{Number of girls} = 102$$

$$= \frac{102}{6} = 17$$

One part of a ratio has
17 students

as, ratio of boys is 4.

So,

$$\text{Number of boys} = 4 \times 17$$

$$= 68$$

$$\text{Total No. of students in one group} = 102 + 68 = 170$$

iv)

$$\text{Present Ages} = 6:7$$

$$\text{After 5 years, } 7:8$$

$$5(7) : 5(8)$$

$$35 : 40$$

Present ages would be,

$$30 : 35$$