General Science & Ability

PART-II

SECTION-II

Good
Keep length equal for all answers
Paper presentation is fine
Fine diagrams

QUESTION NO:06

A) Data:

Votes of three candidates
15000, 10,000 and 8000

To find:

Percentage of total votes of the winning candidate = ?

Solution:

Sum all the votes.

= 15000 + 10000 + 8000

= 33000

% of winning candidate = $\frac{\text{obtained votes}}{\text{Total votes}} \times 100$

= $\frac{5000}{33000} \times 100$

= $\frac{15}{33} \times 100$

= 45.5%

Therefore, the percentage of the winning candidate is 45.5%

Answer.

13) Data:

Given ratio of angles of triangle:

3:4:5

To find:

Find the each angle = ?

Solution:

As, we know, sum of three angles = 180°

Therefore,

3:4:5 = 180

However, we have to find the angle, so 'x' is the angle:

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

$\Rightarrow 12x = 180$

$\Rightarrow x = \frac{180}{12}$ 15

$\Rightarrow x = 15$

Now, put the value of x and find angles:

1st angle: 3 x 15 = 45

2nd angle: 4 x 15 = 60

3rd angle: 5 x 15 = 75

To verify, sum all the values:

45 + 60 + 75 = 180 Verified

Answer.

c) Data:

Each group consists of:
4 boys and 6 girls

102 girls available

To find:

Number of boys required = x = ?

Solution:

First, find number of groups:

$\Rightarrow \frac{102}{6}$ girls/group

$\Rightarrow$ 17 groups

Now, number of boys required:

$\Rightarrow$ 17 × 4 boys/group

$\Rightarrow$ 68

Therefore, 68 boys are required to form the groups in the sports meet.

Answer.

D) Data:

Ratio of A:B = 6:7

After five years ratio will be = 7:8

To find:

Present Ages of A and B

Solution:

Given is the ratio between A and B = 6:7

After five years ratio will be 7:8

Let 'x' be the present ages of A and B, and from the statements:

$$6x+5 : 7x+5 = 7:8$$

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

By cross-multiplication:

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

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

Re-Arranging:

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

$$\Rightarrow x = 5$$

Put the value of 'x' to find present ages:

$6 \times 5 = 30$ and $7 \times 5 = 35$

Therefore, the present ages of A and B are 30 and 35.

Answer.

QUESTION NO: 08

c)

Find correct word from the Jumpled Spellings:

Jumpled Spelling	Correct Words
THRSI	Shirt
GNDREA	Danger
SCHAMOT	Stomach
ONLNDO	London
HIODALY	Holiday

A) Data:

Sum of three consecutive odd Numbers = 273

To Find:

Three odd Numbers = ?

Solution:

Let three consecutive numbers are:

$x, x+2, x+4$

Their sum is:

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

$x + x + 2 + x + 4 = 273$

$3x + 6 = 273$

$3x = 273 - 6$

$3x = 267$

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

$x = 89$

Now, put the values in:

First Number = $X = 89$

Second Number = $X + 2 = 89 + 2 = 91$

Third Number = $X + 4 = 89 + 4 = 93$

Therefore, the three consecutive odd numbers are 89, 91 and 93.

Answer.

B) Given:

Series of number with one missing number

Find:

Missing number in the series.

Solution:

i) 4, 16, 36, 64, ?, 144

The series is the square of even numbers:

Therefore:

$2^2 = 4$

$4^2 = 16$

$6^2 = 36$

$8^2 = 64$

$10^2 = 100$

$12^2 = 144$

The series is: 4, 16, 36, 64, 100, 144.

Answer.

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

The series is the multiple of '2' starting from ~~6 to 11~~ 3 to 7:

1

$2 \times 3 + 1 = 7$

$2 \times 4 + 7 = 15$

$2 \times 5 \times 15 = 25$

$2 \times 6 \times 25 = 37$

$2 \times 7 \times 37 = 51$

The series is: 1, 7, 15, 25, 37, 51 Answer.

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

Series is in descending with substraction of numbers, such as;

30 - 1 = 29

29 - 2 = 27

27 - 3 = 24

24 - 4 = 20

20 - 5 = 25

Therefore, series is : 30, 29, 27, 24, 20, 15

Answer.

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

0

0 + 2 x 1 = 2

2 + 2 x 2 = 6

6 + 2 x 3 = 12

12 + 2 x 4 = 20

20 + 2 x 5 = 30

30 + 2 x 6 = 42

The series is : 0, 2, 6, 12, 20, 30, 42

Answer.

ion of

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

D) Data:

Sara's mother = 6x older than Sara

her brother Ali x2 as old as Sara

Sum of their ages = 72

To find:

Sara, Ali and Mother present age = ?

Solution:

Let 'x' be Sara's age:

Given is;

Sara's mother is: 6x(x)

Her Brother Ali is: Ali x2 x x

~~6x + 2x + x = 72~~

In three consecutive years, the sum of their ages will be:

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

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

$9x+9=72$

$\Rightarrow 9x=72-9$

$\Rightarrow 9x=63$

$\Rightarrow x=63/9$

$\boxed{\Rightarrow x=7}$

Their present Age's:

Mother : $6(7)+3$ = 45 years

Ali : $2(7)+3$ = 17 years

Sara : $7+3$ = 10 years.

Answer.

SECTION- I

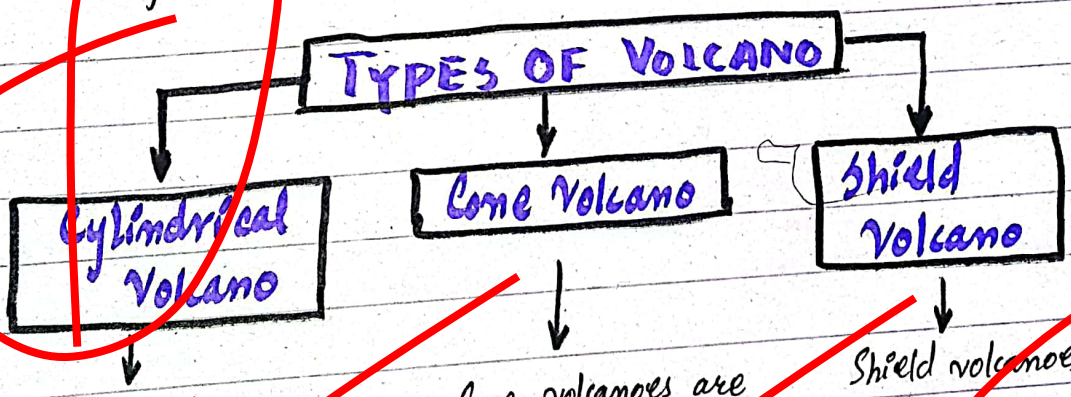
QUESTION NO: 02

A) On 18th december 2023 Volcano was erupted in Iceland and after series of small earthquakes, discuss how volcanoes are erupted?

VOLCANOES:

DEFINITION:

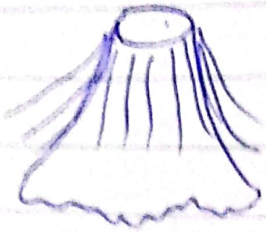
Volcanoes are stream of hot Lava or magma erupted from the inside of the earth. It is made up in the mantle part of the earth, a part beneath the crust of the Earth.



Cylindrical volcanoes are those volcanoes that opens the earth surface and laid down in cylindrical shap.

Cone volcanoes are those volcanoes which are vent from the earth in cone shapes.

Shield volcanoes are those volcanoes which erupt or vent from inside of the earth and laid down as shield.



⇒ Cone Volcanoes from mountains

⇒ Shield Volcanoes from the earth's vent

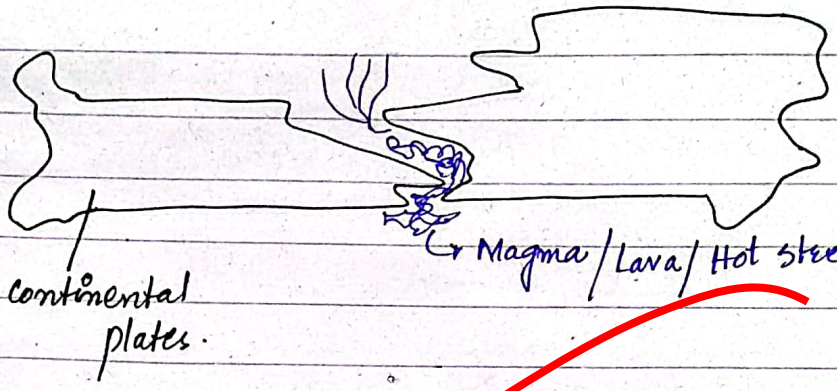
⇒ Cylindrical Volcanoes.

How Volcanoes are erupted:

Volcanoes are erupted because of the following reasons:

01) Deep focus Earthquakes ~ Primary Reason of Volcanoes~

Volcanoes are erupted due to the massive earthquakes. The deep focus earthquakes are caused due intra-plate disturbance because inside them a hot lava or magma present and when these plates diverge or converge, the magma erupted and caused earthquake. It is illustrated below:



02) Molten Rock Fragmentation:

Inside the Earth, there is a huge and intense heat which melts the rock and form flowing substance called magma. This magma rock is much lighter than the solid rocks, therefore, it flows on the surface of the earth - vent.

03) Intense Pressure Build Up Inside the Earth:

A number of gases are dissolved or trapped within the magma. When pressure decreases then the gases start to expand and create intense pressure on the solid rocks and resulted in volcano eruption.

04) Eruption Trigger: ~ Nuclear Reactions ~

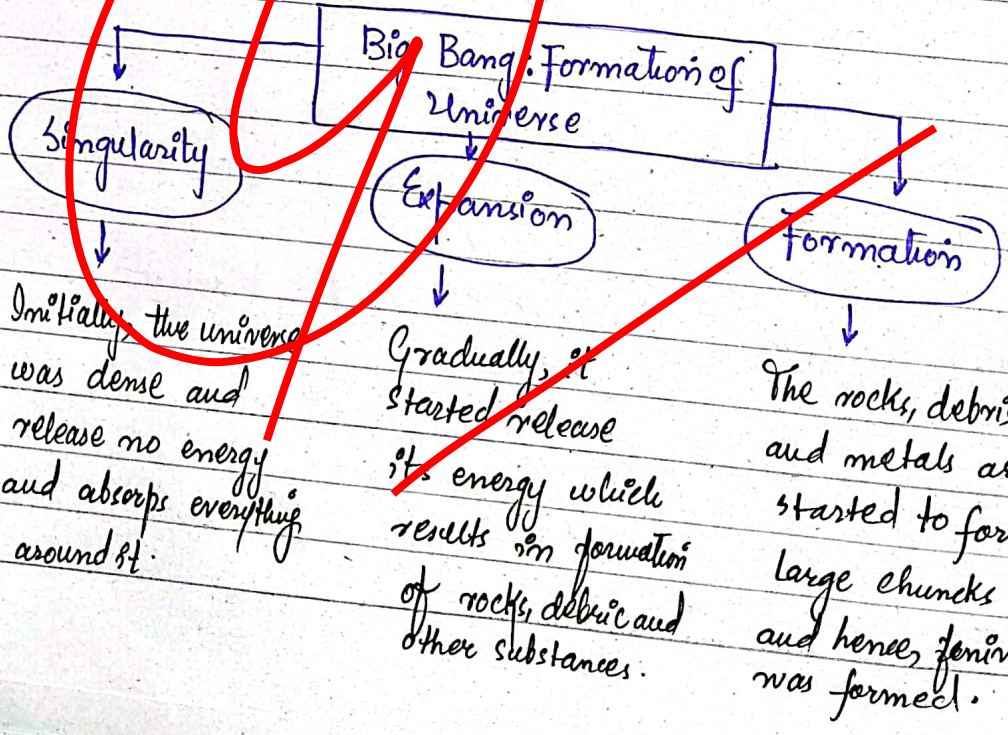
Volcanoes are also erupted when the magma chambers are triggered due to any explosion on the earth surface. It is formed, when any trigger occurs, the magma release gases to

expand which resulted in intense pressure and volcano erupted on the surface of the earth-vent.

B) What is Big Bang and Big Crunch? How age of the universe is determined?

BIG BANG : DEFINITION

Big Bang is a theory of the universe expansion. It is a theory which is used to explain or substaintiate the evidences of the formation of universe and its expansion. According to the Big Bang theorists, universe was initially singular, which after a time expands by releasing its energy and formed universe.



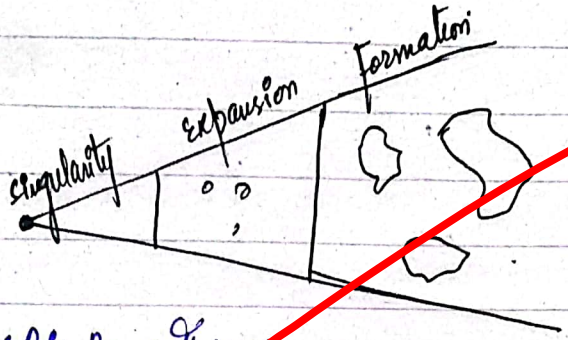
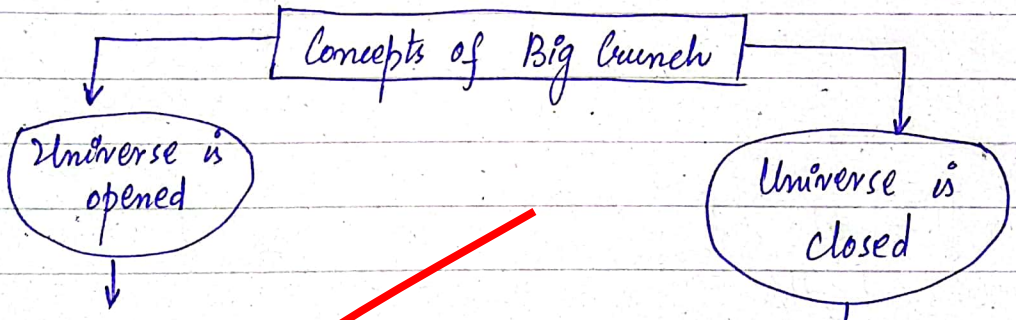


Fig: Big Bang Theory

BIG CRUNCHIN DEFINITION~

Big Crunch is a hypothetical scenario for the universe's future. It proposes that the expansion of the universe will eventually slow down and reverse, leading to a collapse back into a singularity similar to the Big Bang's starting point.



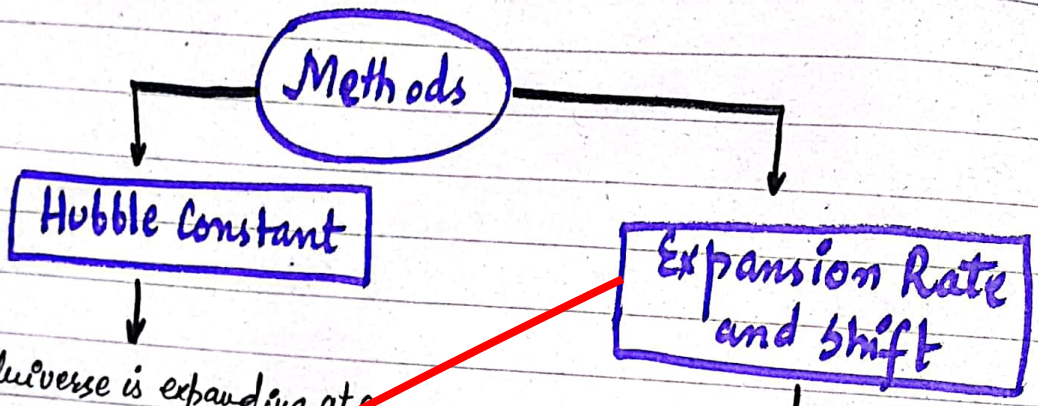
According to Big Crunch hypothesis, Universe is open and expanding, however, it will collapse when blue shifts arises.

According to this, universe is closed and will collapse into its own black hole, because in every galaxy, there exist a black hole.

How Age of the Universe Deter

The age of the universe is determined by two methods:

01) Hubble constant
02) Expansion Rate and Shift in Universe.



Universe is expanding at a high speed, therefore,

$v \propto d$

$\Rightarrow d = vt$ $\quad d = vt$

$v = Hd \Rightarrow t = d/v$

where, $v = H \times d$

So, $t = \frac{d}{H \times d}$

$t = 1/H$

Hence, scientist were able to use hubble constant to determine the age of the universe.

It involves the observing of the oldest stars of the universe and calculating the age of the universe by measuring different parameters of these stars. These parameters are:

1) Luminosity
2) Speed and Spectrum
3) Red and Blue Shift.
4) Mass

c) Discuss any five Sources of renewable Energy.

RENEWABLE ENERGY: ~ DEFINITION ~

Renewable energy is a source of energy to produce clean and environmental friendly energy. It doesnot use any natural resource which contains carbon emissions and nitrogen gases. It is not only carbon free but also efficient source of energy production which is cost effective and available domestically.

SOURCES OF RENEWABLE ENERGY:

There are five sources of renewable energy available which are discussed below:

1) Solar Energy: ~ from Sun Heat ~

Solar energy is an efficient source of energy production for commercial and domestic use. It is a type of renewable energy, hence, it is cost-effective and environmental friendly.

Capture of Solar Energy:

Solar energy is captured by the sunlight into solar voltatic cells fitted on solar pannels and ge which convert the heat into electrical energy.

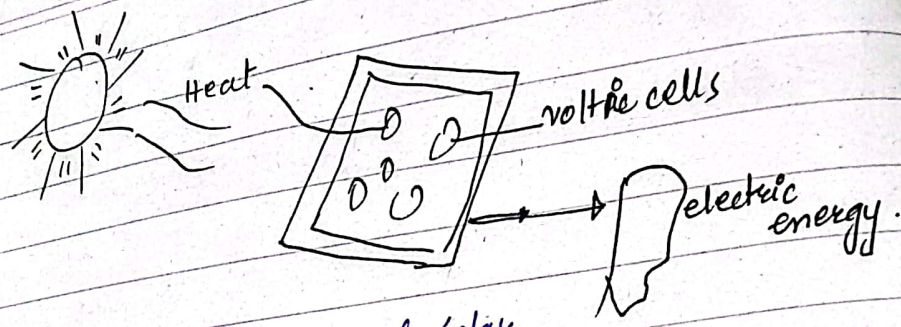


Fig: Phenomenon of Solar Energy formation

02) Wind Energy:

Wind energy is another source of renewable energy and is generated by air. Air stores kinetic energy and the wind turbines capture this kinetic energy and convert it into electrical energy for the usage of large commercialization and sectors.

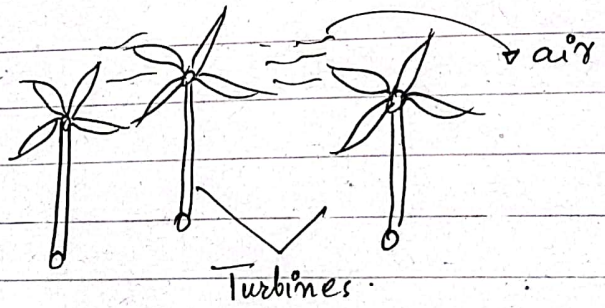


Fig: Phenomenon of Wind Energy.

03) Hydel Energy: ~ Water Source ~

Another form of energy is hydel energy. It is produced by water resources.

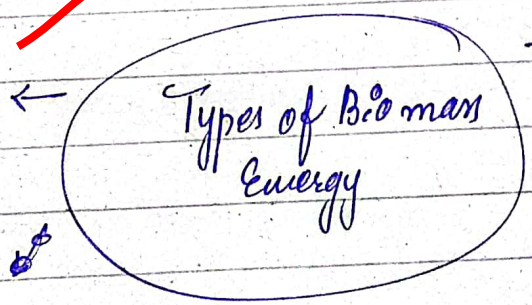
It is a form of renewable energy and used to produce energy for commercial and domestic use. The water stores potential energy and the hydro energy plants convert this potential energy into electricity and provide energy which is environmental friendly.

04) **Geothermal Energy:**

Geothermal energy is a form of renewable energy source and it is used to generate local energy to meet domestic energy demands. It tap the internal heat of the earth by extracting steam or hot water from the underground reservoirs. It provides reliable baseload power source but is limited to specific geographical location.

05) **Biomass Energy:**

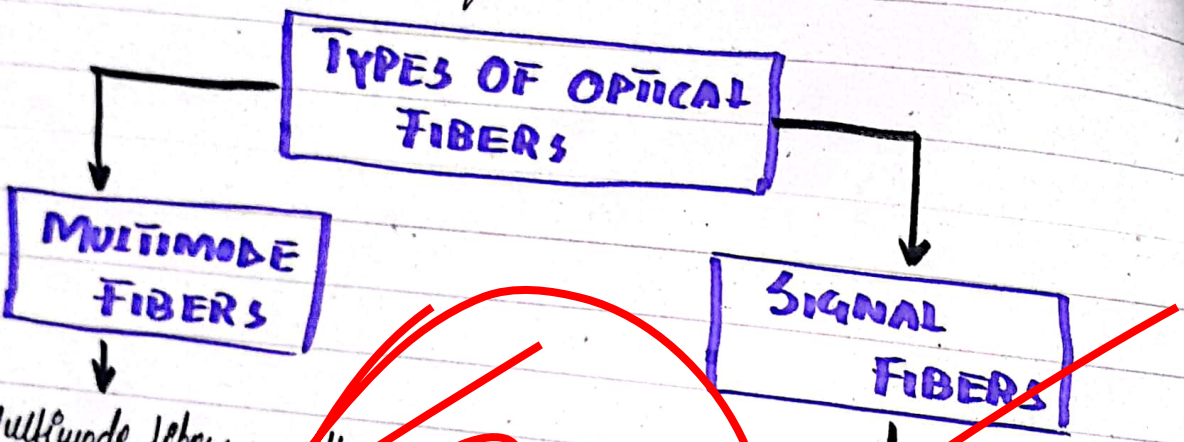
It is derived from the organic materials of the agricultural products. Such as, animal waste, wood, crops waste and crops itself. They provide various byproducts such as heat, biofuels and electricity.



D) Optical fiber: Khunjerab to city Rawalpindi: How it w

OPTICAL FIBER: ~ DEFINITION ~

Optical fiber is a flexible glass or plastic fiber that can transmit light from one end to another. It is used to transmit light signals from one end to another end and these light signals contain information.



Multimode fibers are those fibers optics which used multiple signals and passed multiple signals from a single fiber.

Single fibers are those fiber optics which used only single light to pass from a tube.

WORKING OF OPTICAL FIBER:

Total Internal Reflection: It is an angle of reflection from an incident line and reflects slightly on an angle less than 420. This phenomenon is known as total internal reflection.

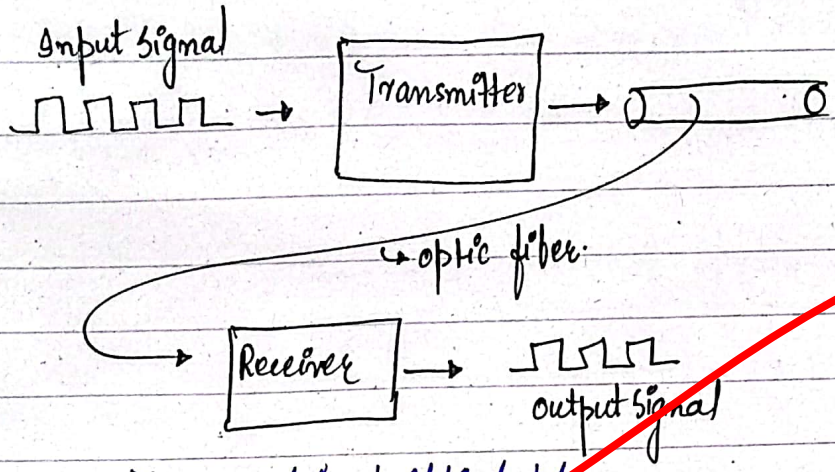
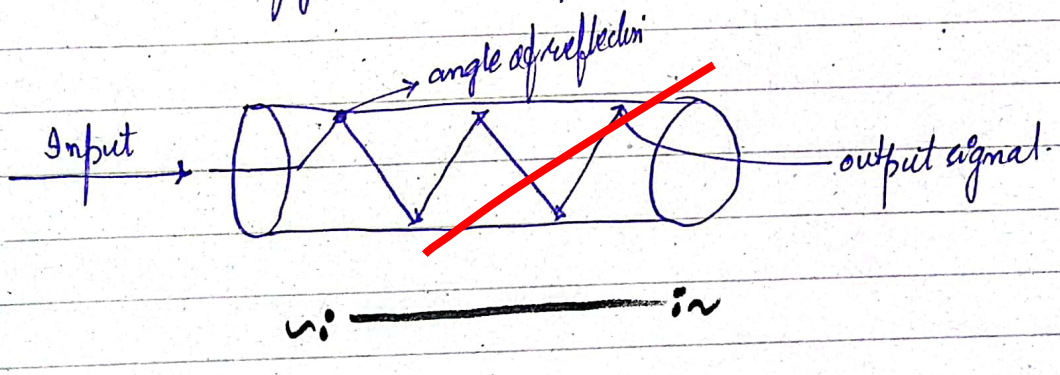


Fig: Working of Optical fiber.

Optical fiber works as, it takes input signal in a light form which transfers to transmitter and this transmitter emits light to the optical fiber to send it to the receiver. The receiver takes signal from optical fiber and converts it into output signal.

fig: Internal Reflection of Optical fiber.



QUESTION NO:04

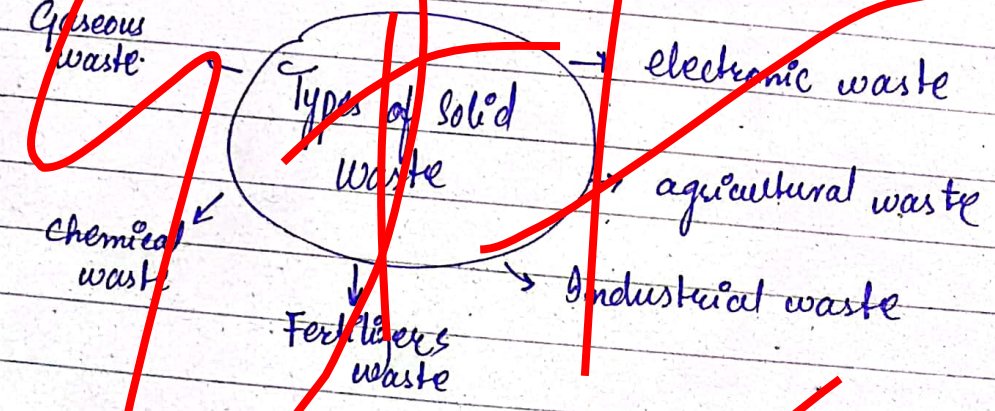
A) What are the methods of solid waste Management?

01)

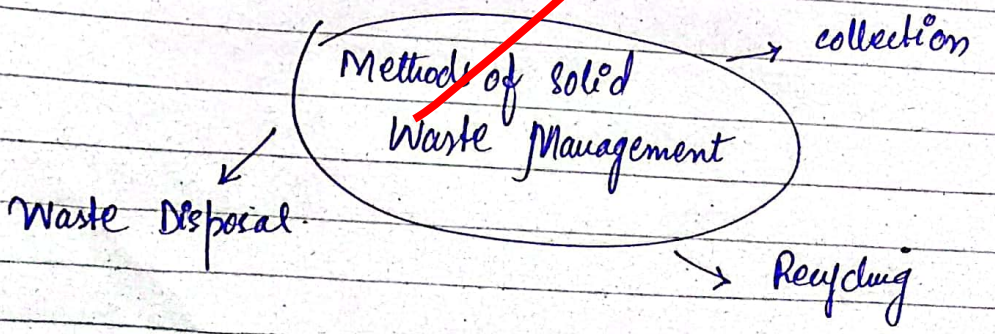
SOLID WASTE MANAGEMENT:

~ DEFINITION~

Solid waste management is a supervised mechanism which involves collection, recycle and waste disposal to a safe side. It is a mechanical or systematic approach to manage solid waste to provide clean or clear environment to the masses.



METHODS OF SOLID WASTE MANAGEMENT:



01) Collection is a primary stage of solid waste Management ~

This is an initial stage of solid waste management. In this stage, the municiple committee workers collect the waste from various sites, it includes, electronic waste, domestic waste and agriculture or animal waste.

02) Recycling Stage:

This stage involves to recycle the waste collected from various sites. It involves recycle, reduce and reuse mechanism of various waste substances.

03) Waste Disposal Mechanism:

This stage is a last and final stage of solid waste management. It involves various methods to dispose solid waste outside the city or produce any useful substance from it.

Methods of Solid Waste Management

- composting
- Vermi composting
- Land fills.

a) Composting:

This methods is an efficient method of solid waste management. It disposes the waste using biological methods and produce a by product from it.

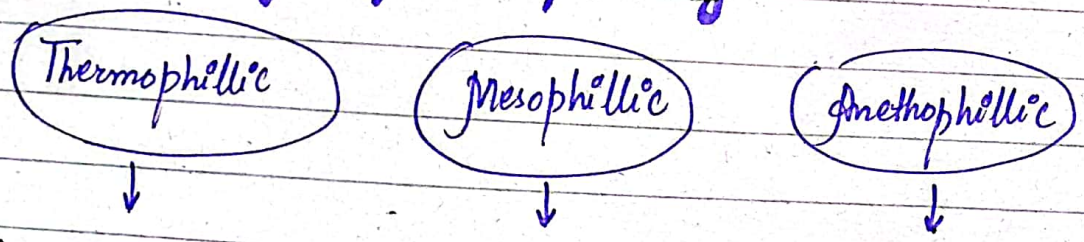
⇒ Parameters of composting:

1) Air
2) Temperature 5 - 15°C
3) PH level
4) Oxygen level.

↳ Components Required of composting:

1) Bacteria's
2) Enzymes
3) Antigens
4) Pathogens.

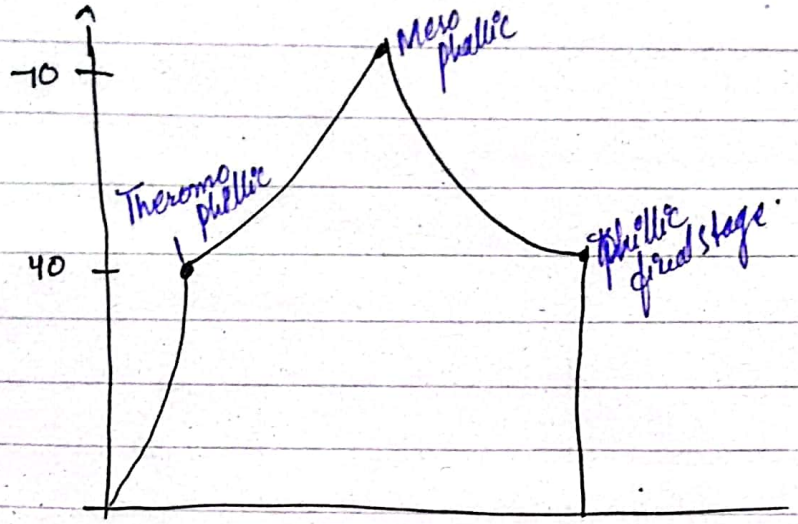
1) Stages of Composting



In this stage, the temperature rises to 40°C and decompose small waste and use bacterias and enzymes.

The temperature rises to 70°C the mesophilic stage starts and it decompose all the large wastes to make a product.

The temperature gradually decreases to 40°C again and remove the useless waste and separate products of fertilizers.

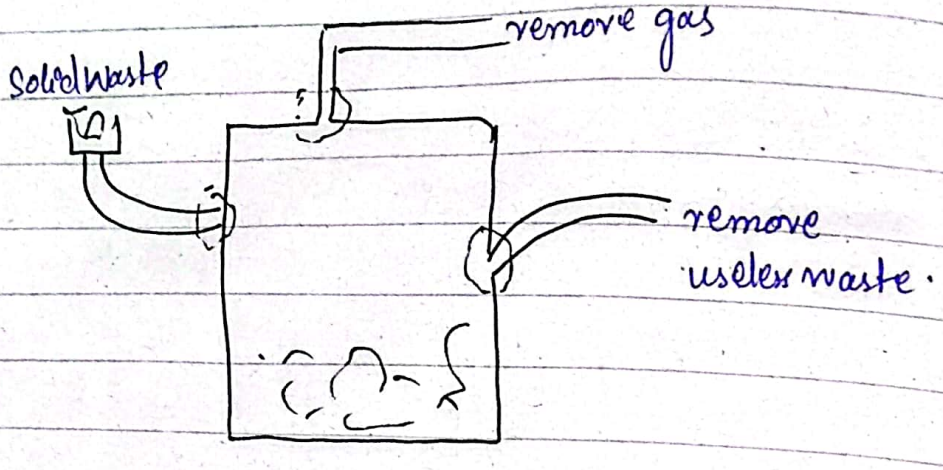


b) Vermi composting:

This methods includes only two stages: Thermophallic and mesophilic. In first stage the temperature rises to 70°C and organic matter decomposed. In second phase, the temperature gradually increases upto 70°C, in this prolonged high temperature extensive organic or non-organic matters are decomposed. It is widely used in India and other developing states.

c) Incineration:

Incineration is another method of solid waste management. In this, a container contains limited temperature and oxygen and the solid waste. Due to high temperature, the waste decomposed and release gas as a product for domestic use. The phenomenon is illustrated below:



d) Land filling:

Land filling is another method of solid waste management. This method is widely used in various countries due to its easiness and simplicity alongwith cost effective for various states.

Methods of land filling

- Trench Method
  - It is used by digging inside the earth like a long trench and dispose solid waste and cover it with a blanket of insulation.
- Area Method
  - It is used as disposing waste of the surface of the earth and cover it with an insulation blanket to stop the release of harmful gases.

B) Working of human heart in blood circulation.

HUMAN HEART :~ OVERVIEW ~

Human heart is a major organ is human body which is responsible for circulation of blood and across the various parts of the body.

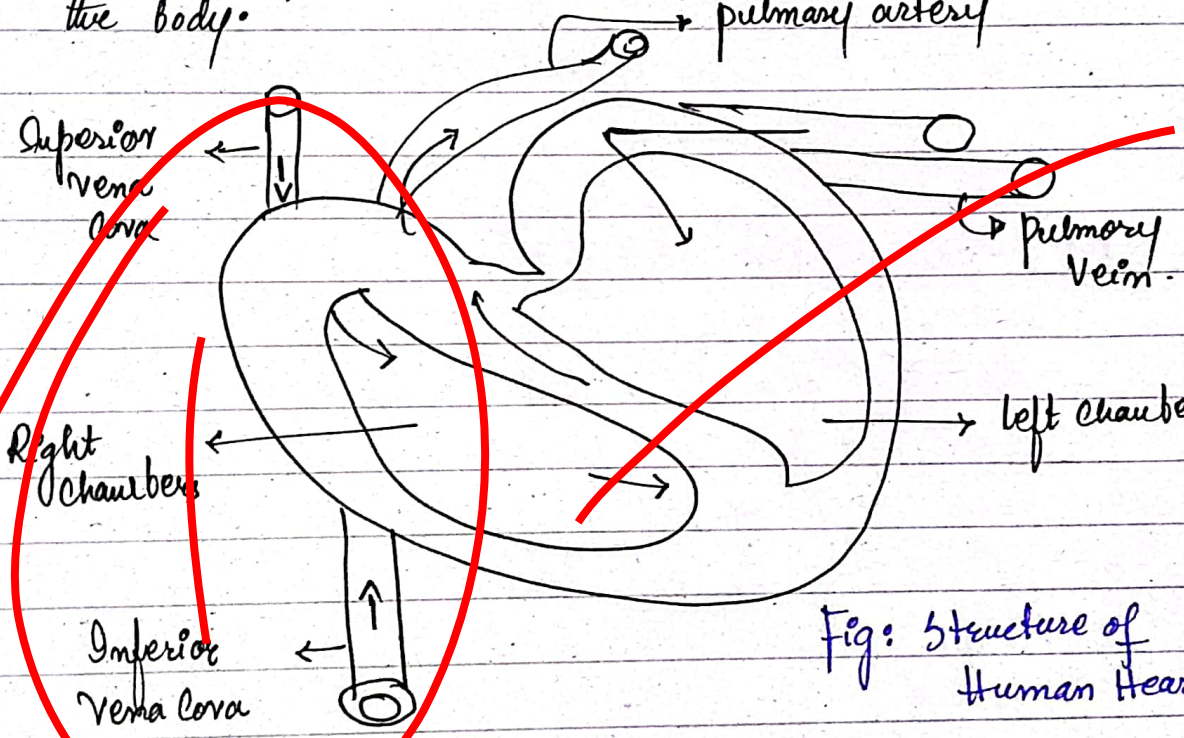


Fig: Structure of Human Heart.

WORKING OF HUMAN HEART:

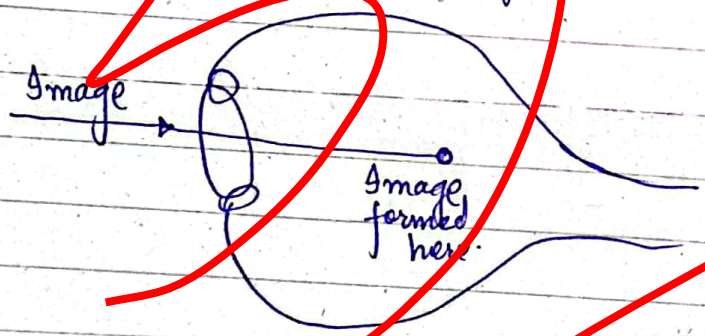
Human heart is responsible for blood circulation across the body parts. It receives deoxygeneated blood from vena cava to right chambers. Then pulmonary artery brings of blood to liver, where blood is oxygenated. Also, the oxygenated blood transfer to left chamber using pulmory vein. Then, in left chamber, there are various veins

and arteries which are responsible for blood circulation to various organs. The arteries receive oxygenated blood from left chamber and transfer to kidney, pancreas and many other organs and to capillaries as well.

c) What is Myopia and hyperopia? enlist the major parts of human eye.

MYOPIA :~ DEFINITION~

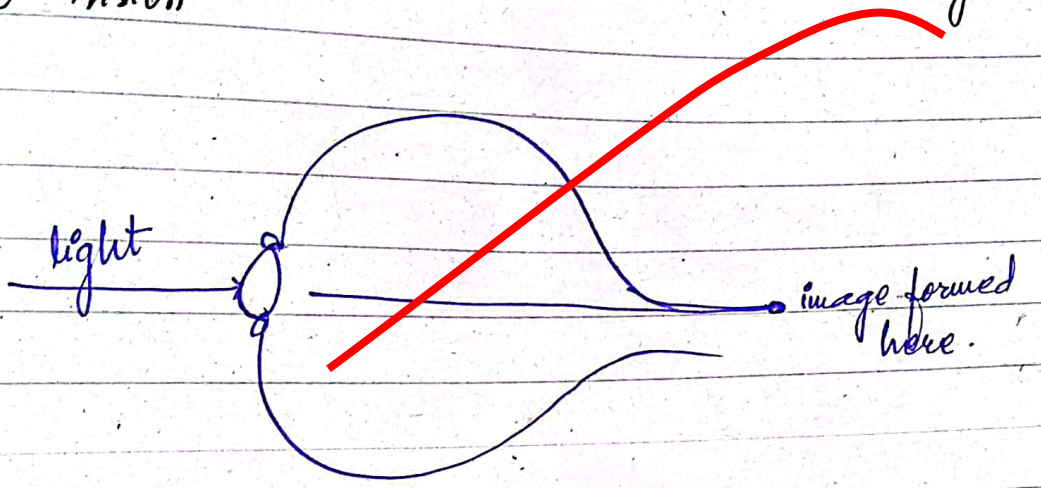
Myopia is a eye disease or vision destruction. In this, the image is not formed at retina. It occurs before the retina due to which a myopic person perceives image as blurr and faced difficulty in distinguishes the different images. It can be resolved by convex lens.



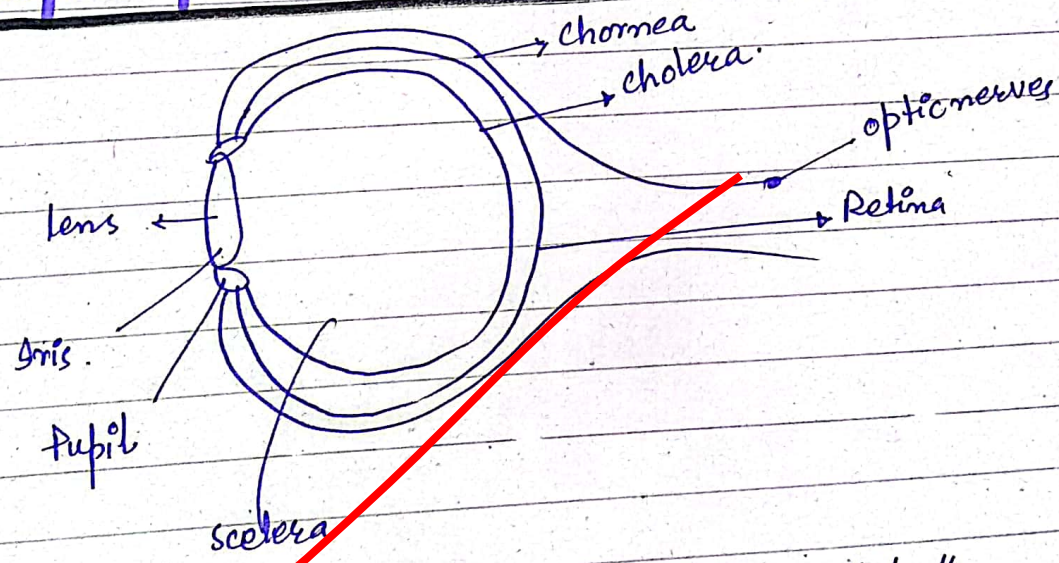
HYPEROPIA :~ DEFINITION~

Hyperopia is also known as farsightedness. In this, image is formed

beyond the retina which resulted in unable to distinguish what a person is seeing. The entered light and formed image behind the retina and blurring the vision.



MAJOR PARTS OF THE HUMAN EYE:



01) Iris: The colored part of the eye which controls the light entering the pupil.

02) Pupil: Inside the iris which controls the amount of light entered in the eye.

03) Lens: Transparent structure behind the pupil and controls the light and formed image on the retina.

04) Retina: A part of the eye where imaged formed.

05) Optic Nerve: Connects the nerves to the brain to sense the visionary information.

06) Cornea: Supports the eye ball and structure.