ADEENA KHAN
→ Batch: 076
→ GENERAL SCIENCE AND ABILITY

PART - II
(Section- A)

Question no 2:
Part b:
Define urinary system and explain the
working of nephron?

URINARY SYSTEM:

Definition:
"Urinary system is the
system of organs, ducts
and structure that is
involve in production
and secretion of urine."

Part of Urinary System:
Urinary system consist of Following
parts:

1. Kidneys
2. Ureter
3. Urinary bladder
4. Urethra

Human beings and other mammles consist of a pair of kidneys that filters out unwanted wastes into a tube called ureter. From ureter it enters into urinary bladder and they is excreted through urethra.

Diagram:

Left Kidney ←
→ Right Kidney
Ureter ←
→ urinary bladder.
Urethra ←
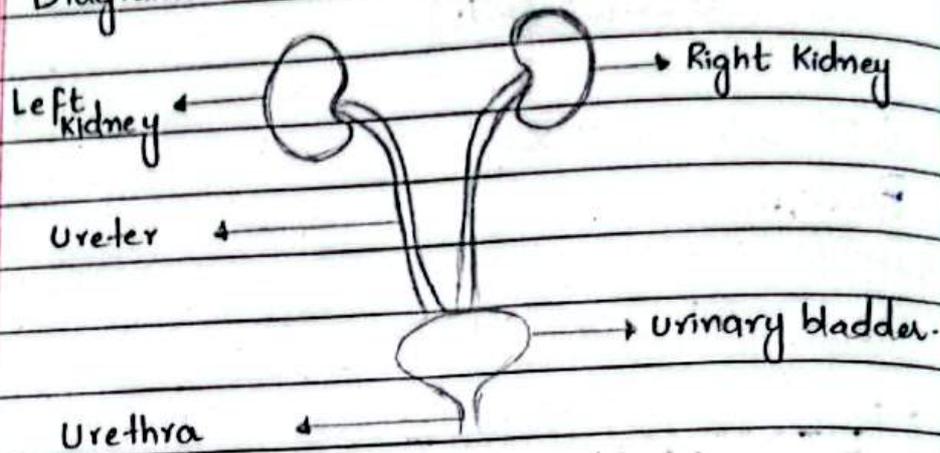
NEPHRON:

Definition:

" Nephron is the basic structural and functional unit of kidney."

Explanation:

Human Kidneys consist up of more than "One million" nephron. Basic function within kidneys are carried out by nephrons. Nephrons consist up of two parts.
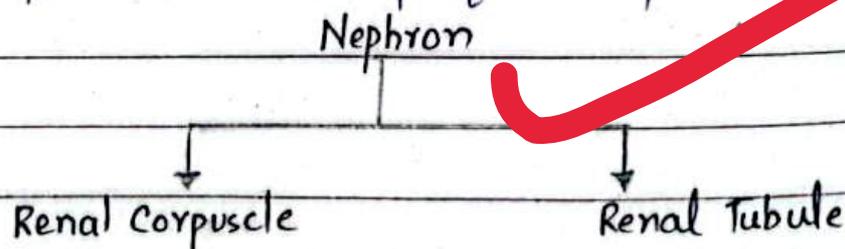
Nephron
├── Renal Corpuscle
└── Renal Tubule

Working of Nephron:

Nephron's two parts renal corpuscle and Renal Tubule further comprises of different parts that carries out formation of urine by extracting out unwanted materials.

Function of Renal Corpuscle:

Renal corpuscle further consist of glomerlus and Boman's capsule. The process of "pressure filteration" take place here. Here glomerulus is composed up of blood cappilaries where due to higher pressure, unwanted materials are separated from blood and moves towards bowman's capsule.

Function of Renal Tubule:

It comprises of "Proximal convoluted Tubule", 'Distal convoluted Tubule" and the "Loop of Henle". Here the process "Reabsoption" and "Tubuler secretion" take place through which usestul materials are absorbed in proximal convoluted tubule and then further waste products moves toward distal convoluted tubule and finally enters into the loop of Henle. and is secreted from the Kidney.

Flow chart:

Nephron

- **Renal Corpuscle**
  - Glomerulus
    - pressure Filteration
  - Bowman's Capsule
- **Renal Tubule**
  - Proximal Convoluted Tubule
  - Distal convoluted Tubule
  - Loop of Henle
    - Reabsorption and Tubular Secretion.

Diagram of Nephron:

Glomerulus   Bowman's capsule

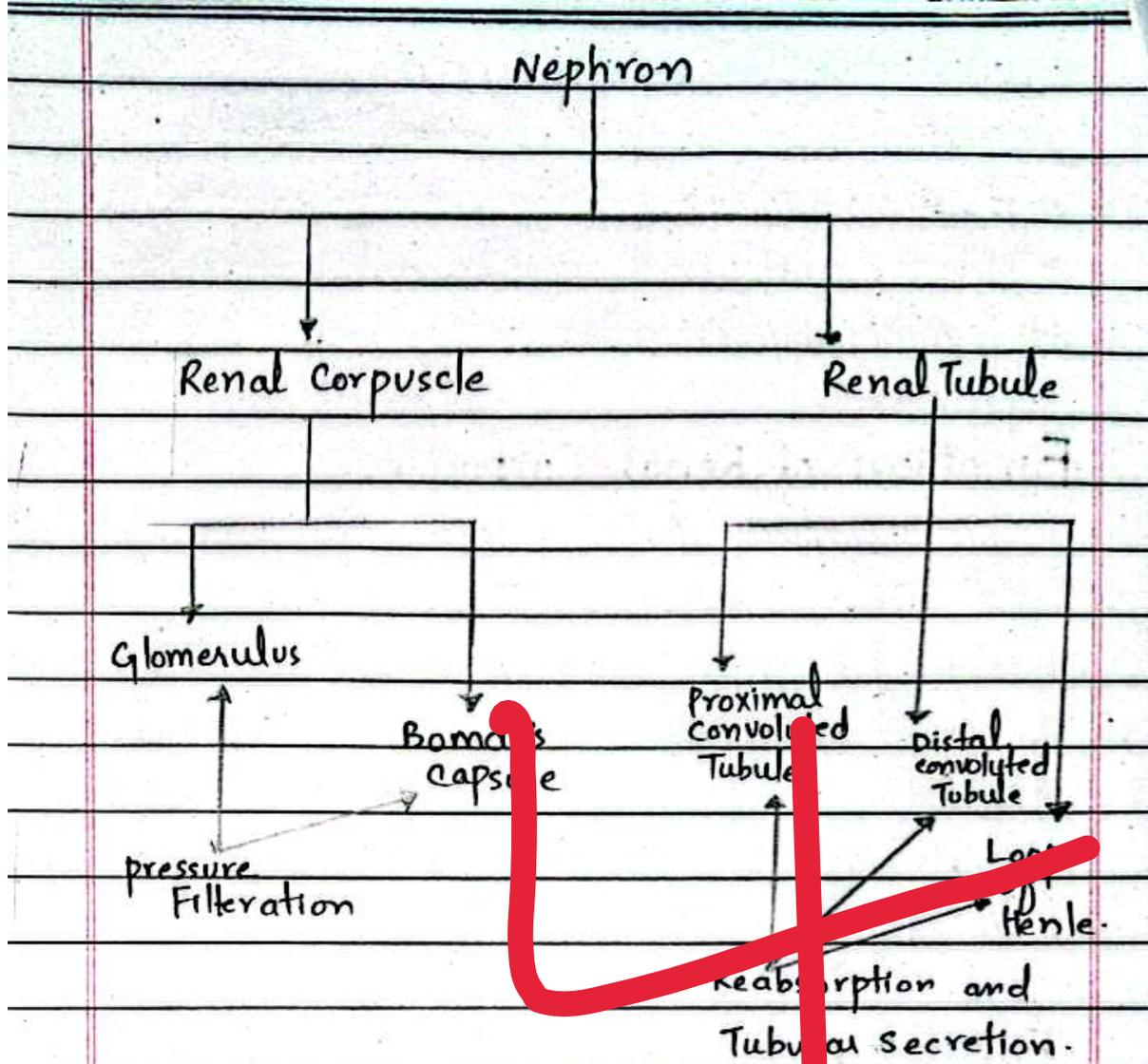proximal convoluted Tubule.

Loop of Henle

Distal convoluted Tubule
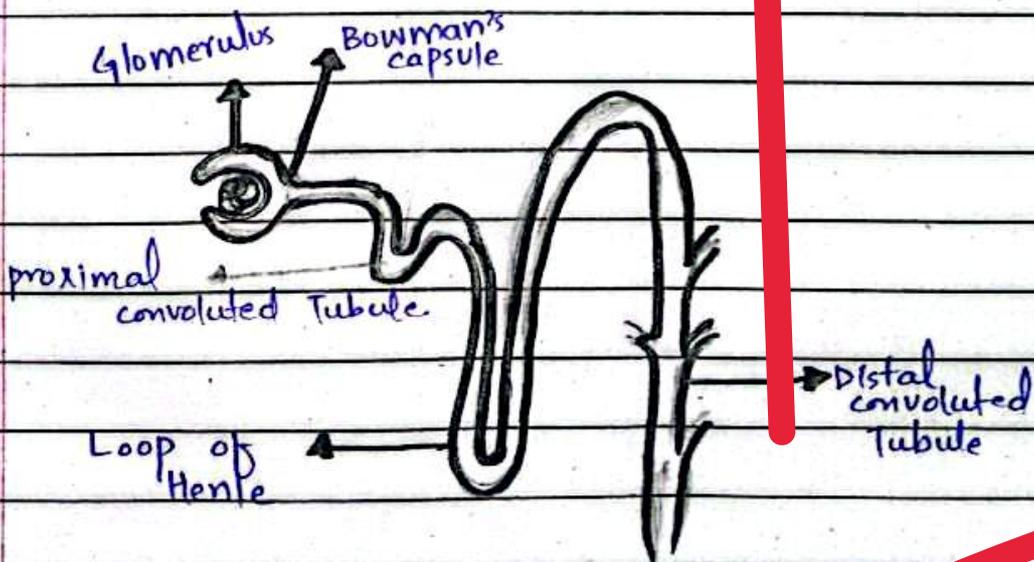
Working of nephron.

Part d:

Describe the structure and functions of cell wall, cell membrane, cytoplasm and mitochondria?

-1 Cell Wall:

Cell wall is the outer most layer in cells of plant, fungi and prokaryotes.

Structure of cell wall:

Cell wall is composed differently in different organism. It is composed up of three layers.

Primary layer → Secondary layer → Middle lamela
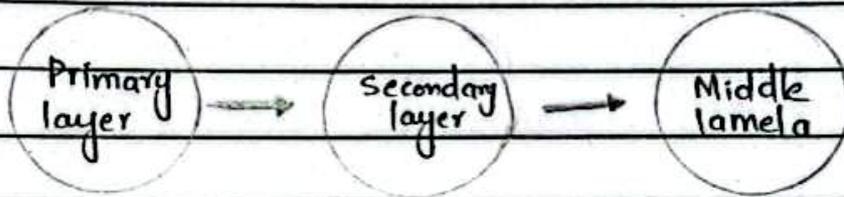
1 Primary Layer:

Primary layer is composed up of cellulose in Plant cell. In prokaryotes, it comprises of murien and Fungi cell wall consist of cellulose.

2 Secondary layer:

It consist up of cellulose, legnin and other materials.

Middle lamela:

It provides connection between the cell wall and inner portion of cell.

Functions of cell wall:

Cell wall provides protection. It also provides the support to cellular organelles. And protects the cellular organelles from outside enviornment. It also gives the definite and proper shape to the cell.

2 Cell Membrane:

It is the outer most boundary of animal cell, while in plants and other organisms it lies inner to the cell wall.

Another name:

It is also called as 'Plasma membrane'. It is selectively permeable membrane.

Structure of cell membrane:

Many models describes the structure of cell membrane. Among them most effective is 'Fluid Mosaic Model'.

Fluid Mosaic Model:-

It was presented by "Singer and Nicloson". According to this model there is a lipid bilayer in which proteins molecules are embeded or are floating. Proteins molecules are sandwich between the lipid bilayer.

Diagram:
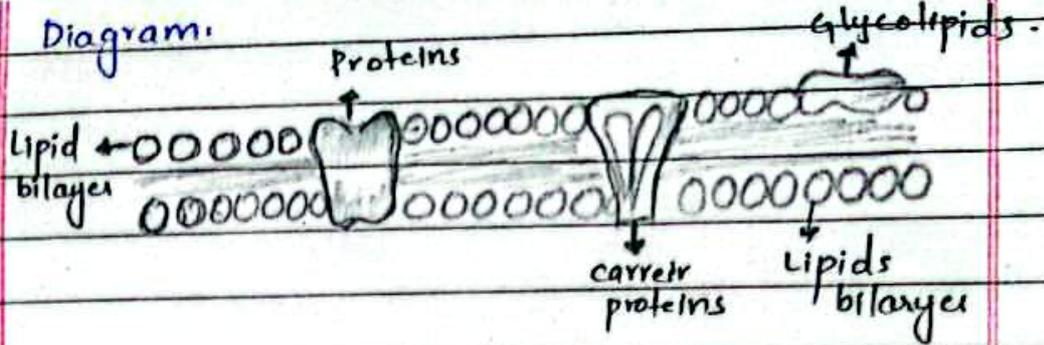
Function of Plasma Membrane:

It provides protection in animal cell to the cellular organelles. It also gives support to the cell. It gives definite shape to cell and is selectively permeable membrane which means it allows selective materials to pass through it.

3 Cyto Plasm:

Cytoplasm is the aqueous chamber within the cell. All cellular organelles lies with th in the cytoplasm.

Parts of Cytoplasm:

Cytoplasm

Soluble Part	Insoluble part
→ Comprises of 70-80% portion → Important chemical	→ comprises of Cellular organelles

Structure of Cytoplasm:

Cytoplasm of cell consist up of aqueous solution and is also reffered as aqueous chamber. 70 - to 80% of cytoplasm is soluble and consist of important chemicals while rest of cytoplasm consist up of cellular organelles.

Function of cytoplasm:

1. Cytoplasm's soluble part consist up of important chemicals that helps in important metabolic activities.

2. Inslouble part serves as the site for import reactions such as protein formation by ribosomes.

4

Mitochondria:

Milochondia is only present in eukaryotic cell. It is also called as "Power house of cell".

Structure of mitochondria:

It consist up of two membranes.

1. Outer membrane

2. Inner membrane.

Outer membrane is smooth while inner

membrane is folded inwards and give rise to cristae.

Function of Mitochondria:

Mitochondria is called as power house of the cell because respiration take place here and it results in formation of ATP which is high energy molecule or is called as energy currency of the cell.

Diagram:

Inner Membrane

Cristae

Outer Membrane

Site Formation of ATP
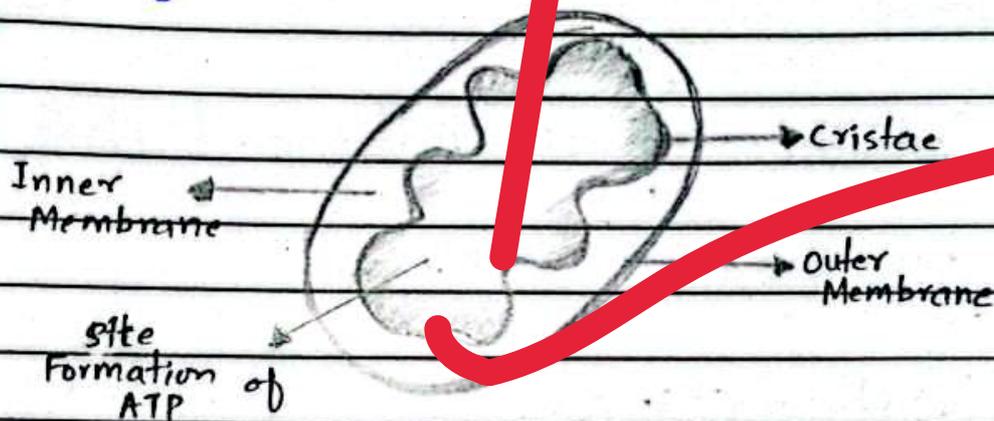
Part c:

What is unbalanced diet? How it affect the healthy living?

Unbalanced Diet:

Definition:

Any diet that dos not contains all classes of food and lack healthy

portion or is deficient in proper nutrient is called as unbalanced diet."

Explanation:

Un-balanced diet lacks important nutrients that are essential for growth of normal body functions. It either comprises larger portion of only one class of food that results in deficiency of other classes of food. It causes several diseases and weaken immunity and stamina.

Affects of Un-balanced diet on healthy living:

Malnutrition:

Unbalanced diet is not balanced. Consumption of unbalanced diet causes mal-nutrition which weaken body's functions and immune system. For example Nao Vegan consumed only fruits and died at age of 30 due to lack of proper nutrients and other classes of food.

Causes Marasmus:

It causes marasmus, a type

CamScanner

of disease in which human body lacks or there is deficiency of proteins and other classes of food. It results in weakness and skinny appearance.

Causes Kawashioker:

It is a type of disease in which there is deficiency of proteins, the important class of food. required for important activities of life. It mostly occurs in African's children lack access to balanced diet.

Weak immunity and Fatiuge:

An unbalance diet lacks essential vitamins, proteins, carbohydrates, Fats etc which performs important function shortage of these nutrients results in fatiuge and alot of diseases spreads as a result of weak immunity

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Part a:

Describe the structure of universe according to Big Bang theory?

Structure of Universe according to Big Bang

Theory:

"According to the "Big Bang Theory": Universe is formed from a single, dense hoter point, 13.8 billion years ago and is still expanding."

Singularity:

According to Big Bang theory, universe lies in big bubble that was hot and dense. The bubble brust and universe start expanding from a smaller point than atom and expand to the larger galaxies and expands further into larger units.

Formation of Universe:

The galaxies and other units within the universe formed from smaller particles and expanded to much larger once. The expansion and cooling of at energy resulted in formation of matter and antimatter. Many of particles destroyed each other. Some were left that resulted in formation of universe. Protrons and neutrons were formed. Further it resulted in formation of atoms and electrons. Hydrogen and helium atoms were

were formed from the dense hot clouds. It further resulted and formed galaxies, stars and other important constituents of astronomy (...)

Diagram

Formation of stars.

end of galaxies.

Big Bang

Formation of Moon

Formation of Galaxies

Formation of solar system

End

End of universe
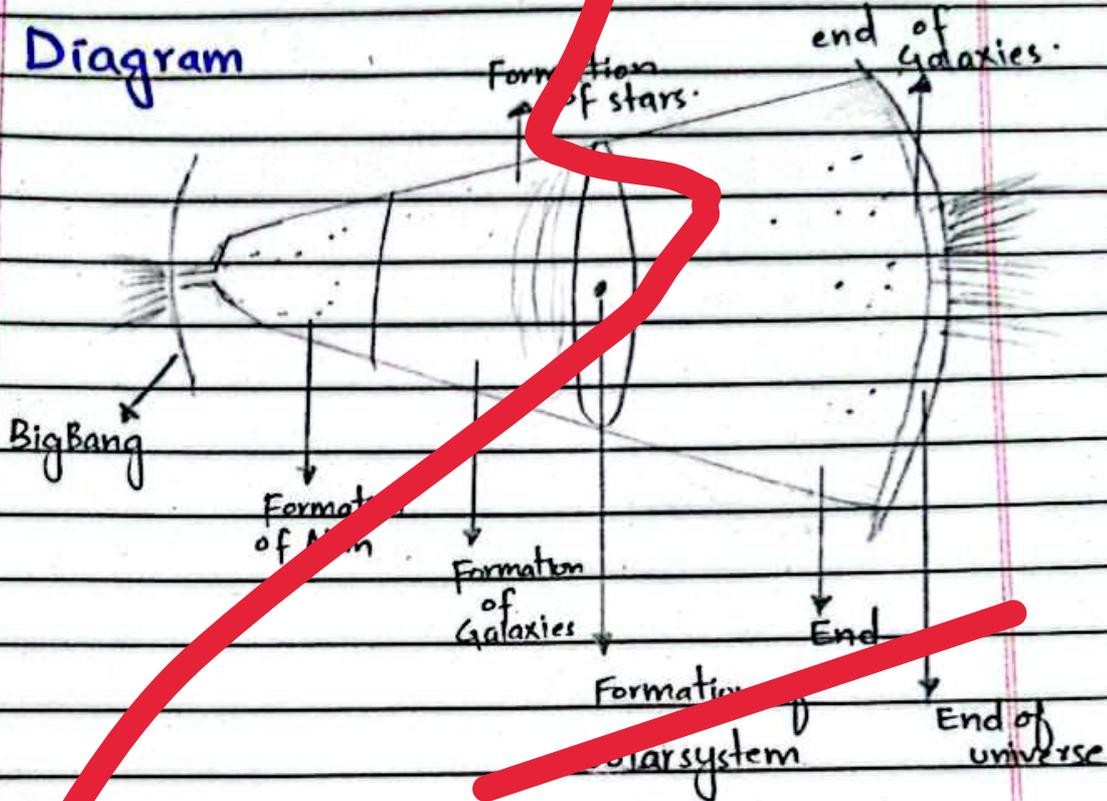
Visual Representation of Big Bang Theory.

Question no 4:

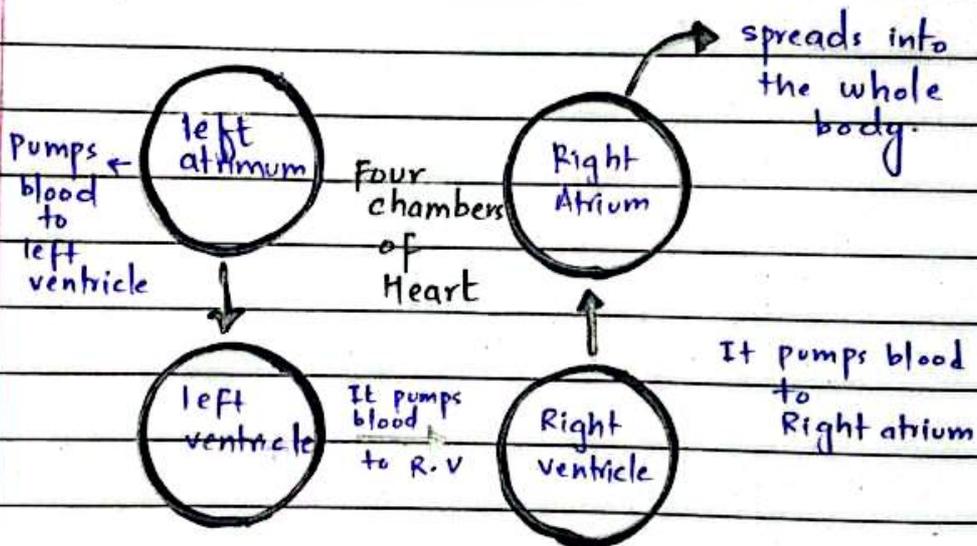Explain the role of heart and blood vessels in circulation?

Answer:

HEART:

Heart is important and vital organ that pumps the blood through whole body

within body of animals. Human heart is located in chest cavity bneath the sternum between the lungs. It is conkal in shape.

Chambers:

Human heart consist up of four charmers.

1. Right Atrium
2. Left Atrium
3. Right Ventricle
4. Left Ventricle.

Pumps blood to left ventricle ← left athmum

Four chambers of Heart

Right Atrium → spreads into the whole body.

It pumps blood to R.V

left ventricle
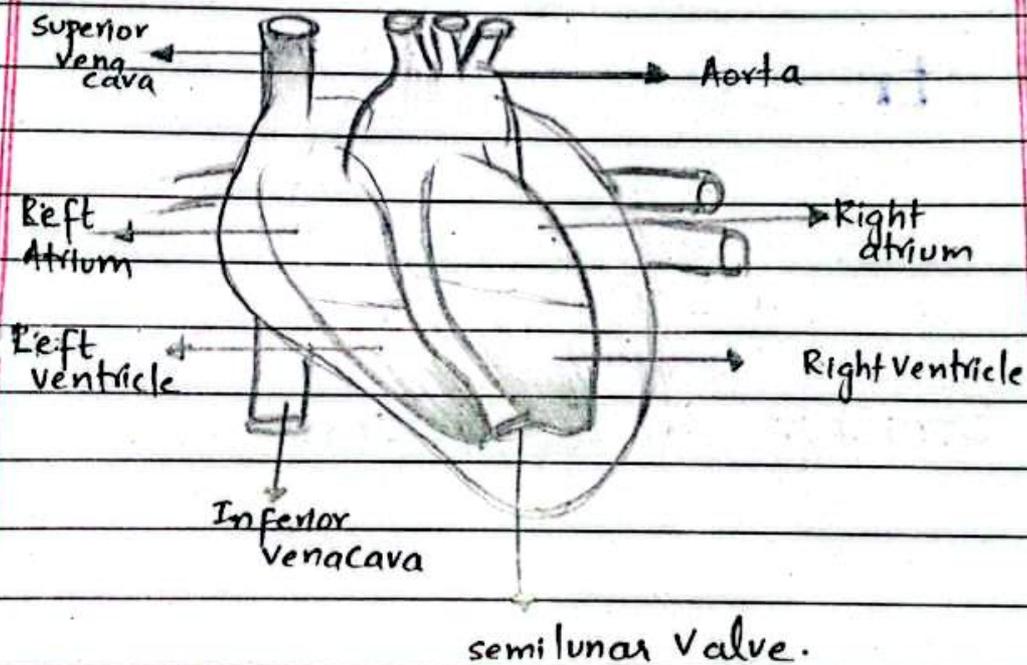
Right ventricle

It pumps blood to Right atrium

Role of Heart:

Herman heart is surrounded by double membrane calle paricardium. It also heart to expand and pumps blood through But the body. and rculates nutrients, hormones, chemical and enzymes in form of blood During circulation blood moves from heart into the lungs. From

their blood is oxygenated and enters the heart through pulmonary vein. From here it enters into left atrium and through tricuspid valve enters into the left ventricle. Then it enters into the right ventricle and further into the right atrium through biscuspid valve and enters Aorta and spread in the whole body.

Diagram:

Superior Vena cava

Aorta

Left Atrium

Right atrium

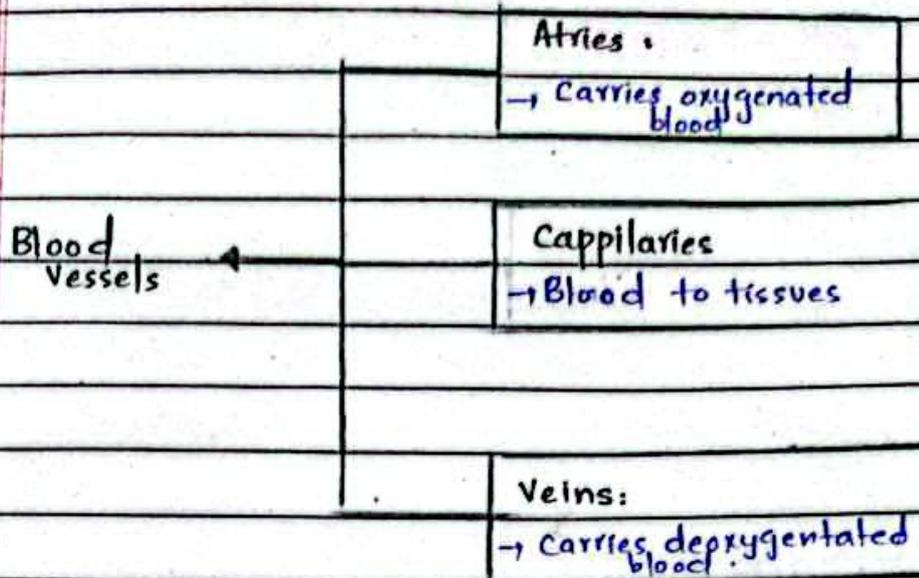Left ventricle

Right Ventricle

Inferior VenaCava

semilunar valve.

Blood Vessels in Circulation:

Blood vessels is the network of vessels that spreads and circulates blood through out the body.
There are three types of blood vessels:

Atries :
→ Carries oxygenated blood

Blood Vessels ←

Cappilaries
→ Blood to tissues

Veins:
→ Carries deoxygentaled blood .

1 Atries :

" Artries are the vessels that carries blood from heart towards organs ."

Structure and Function:

Artries are made up of three layers. The pressure within artries is high. It carries oxygenation blood from heart towards organs except pulmunary atrey which carries deoxygenaled blood from heart to lungs. "Aorta" is the largest artery in body.

Example:

Renal arteries, heptic artries, pulmunary arteries.

Cappilaries:

" Cappilaries are very thin vessels that trasport blood from other vessels into tissues."

Structure and Function:

Cappilaries are thin walled and composed up of only one layer. They are so thin that single blood cell can pass through it. It dissolves oxygen into the tissues. They are spread through out the body.

Veins:

" Veins are the blood vessels that carries blood from organs to the heart."

Structure and Function:

It is made up of three layers ie primary, secondary and middle. All veins carries deoxygenated blood from organs to heart except pulmonary vein that carries deoxygenated blood from lungs to heart. Superior Venacava and Inferior

are largest vein in body.

Examples:

Pulmonary Vein , Renal vein etc.

Part b:

What is cyclone? Describe the formation of cyclone?

CYCLONE:

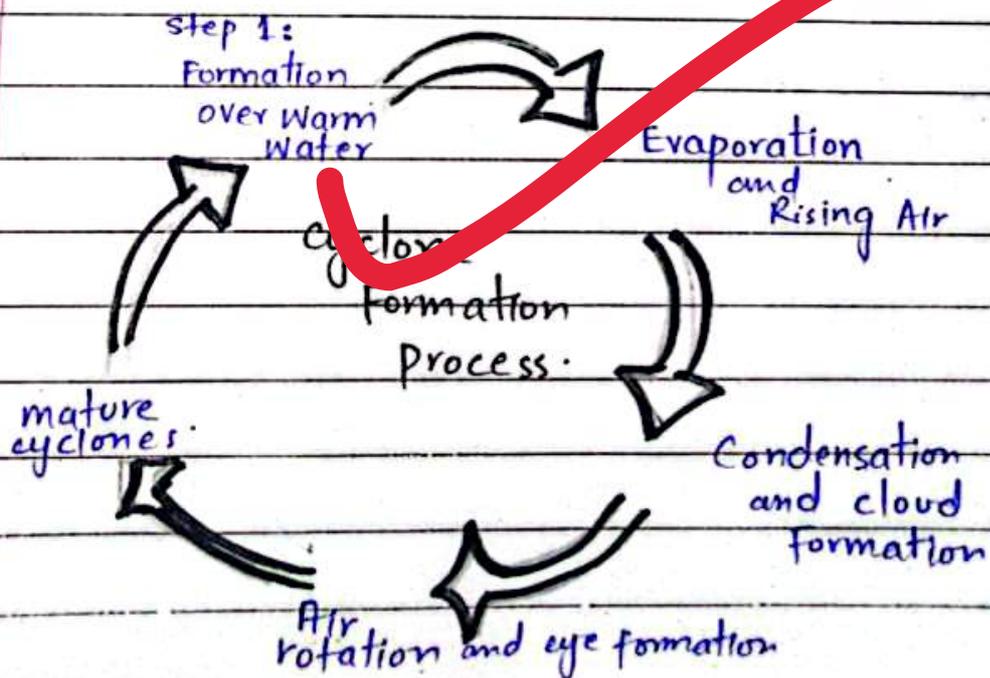## Definition:

"A cyclone is a large-scale air mass that rotates around a strong center with low at--mospheric pressure."

Cyclones are associated with strong wind, heavy rains and stormy weather.

Formation of Cyclones:

step 1:
Formation over Warm Water

Evaporation and Rising Air

cyclone formation Process.

Condensation and cloud formation

mature cyclones.

Air rotation and eye formation.

1. Formation over warm Water:

Cyclone usually form over hot water of oceans., temprature ranging from 26°C.

2. Evaporation and Rising Air:

The vapours formed evaporate. and reculls in rising air over the water bodies.

-3 Condensation and cloud formation:

After rising air cordense through process of condesation and heavy clouds are formed.

4 Air rotation and Eye Formation.

The air the spread to fill the low atmospheric spaces and builts high pressure. and start rotating around strong center. in form of eye.
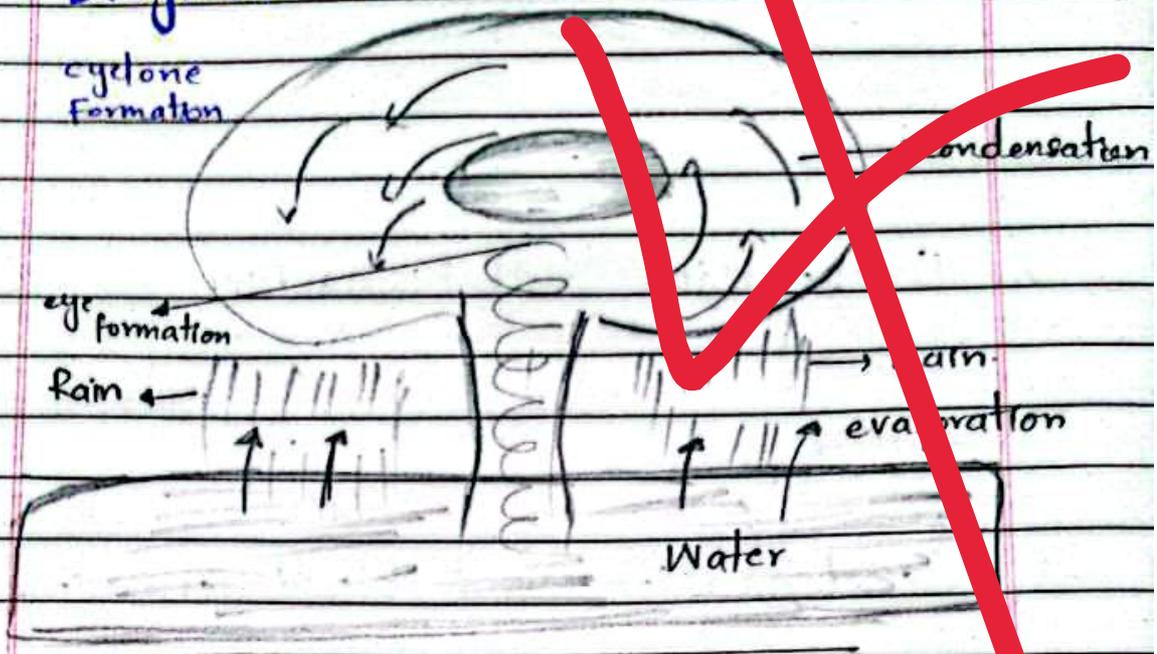
5 Mature cyclone:

It then develops into mature cyclone that are associated with stromy weather and heavy rain.

Example:

Hurricances, Typhoons.

Diagram:

cyclone
Formation

condensation

eye formation

Rain

rain

evaporation

Water

Part:C :-

Enlist the Functions of the following?

1 Carbohydrates:

Definition:

"Carbohydrates is important class of food that is composed up of elements such as carbon, hydrogen and oxygen."

Carbohydrates are also called as "Hyderates of Carbon".

Function of Carbohydrates:

Carbohydrates are obtained from

cerels , barley, bread , potatoes etc. It is largest class of food that exist on earth It provides energy to the body and helps in metabolic activites.

Examples:

Glucose , Fructose , sucrose etc

2 Proteins:

Definition:

" Proteins is important class of food , composed up of amino acid that helps in growth and repair of body "

Amino acids are building block of proteins. Protein consist of carbon, hydrogen, oxygen, nitrogen and some times sulpher.

Function of Proteins:

Protein perform many functions. It helps in growth and repair. Enzymes are proteins in nature that regulates body function. Antibodies are proteins in nature that help in formation of immune system and protects from diseases.
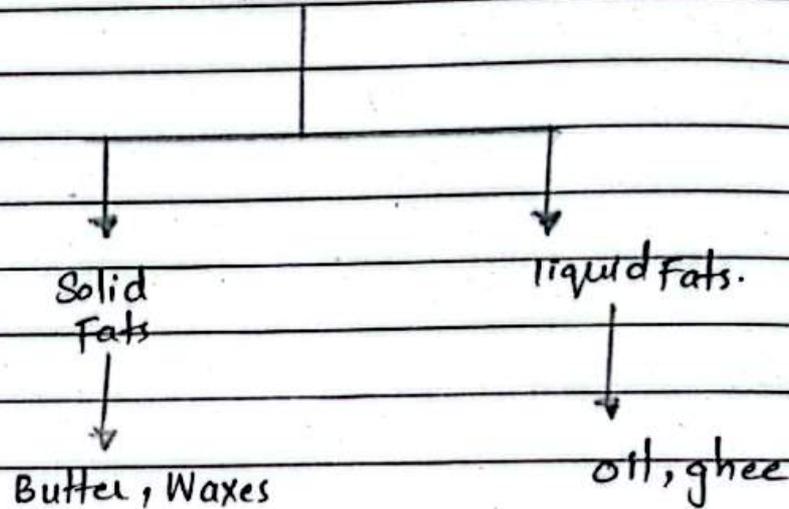
3 Fats:

Definition:

"Fats is important class of food that comprises of lipids and oils."

Fats are found in dairy products, cheese, butter and oils.

```
                Fats.
                  |
        +---------+---------+
        |                   |
        v                   v
     Solid              liquid Fats.
     Fats                   |
        |                   v
        v               oil, ghee
   Butter, Waxes
```

Function of Fats:

Fats provides alot of energy that is needed and required by body for performing different functions. It is stored in body cell and utilized by body when needed.

4 Calcium:

Definition:

Calcium is important mineral that makes teeth and bones strong."

Function of Calcium:

Calcium is important mineral that is required by bones and teeth. It makes bones and teeth strong and also regulates other body functions. It is found in milk and other dairy products.

-5 ## IRON:

Definition:

" Iron is important mineral required by heamoglobin in the blood."

Function of Iron:

Iron gives strength to the body and is important element required by hemoglobin in the blood and also helps in transfer of oxygen ~~from~~ with in the body through hemoglobin of the blood.

Part d:

How remote sensing can be employed for enviornmental purpose?

Answer:

Remote sensing can be effectively used for enviornmental purpose. The use of satellites, drones and aircrafts collect data and examines enviorment

Enviornmental Applications of Remote Sensing:

1 Forest Monetoring:

It is an effective method to examine and monitor deforestration and mafias that are involved in removal of trees illegally. It also monitors the effective & control of deforestration and implementation of reforestation schemes.

-2 Disaster Managment:

It also detects the disasters and conditions within effective cities. It makes the control of managment easy and noticable.

3 Water Resource Managment:

Large area projects are hard to manage
Remote sensing makes it easier and
effective . Large ___ can be manage
smoothly in effective way.

Managing Agricultural Projects:

It also manages agriculture
projects and land resources management.
It helps in fulfilling large land
project an provides effective
examination.

SECTION B"
Question no 6

Part b:

Solution:

Given data:

$$Speed = 12 \, Km/hr = 200 \, m/min$$

$$Distance \, (perimeter) = 200 \times 8 = 1600$$

To Find area = ?

$$Let \; length = 3x \; , breath = 2x$$

$$Perimeter = 2(3x + 2x) = 1600$$

$$10x = 1600$$

$$x = \frac{\cancel{1600} \; 160}{\cancel{10}}$$

$$x = 160$$

$$Area = 3x \times 2x = 6x^2$$

Now we have value of x

$= (160)^2$

$= 53600$ sq.m A...

Part "a":

Solution

It is given that Ahsan's brother's daughter is Ahsan's niece.

The women's grand daughter is Ahsan's niece.

"So women is Ahsan's Mother."

Part "c"

Solution:

Let number $= 10a + b$

$$b = a + 2$$

$$(10a + b)(a+b) = 144$$

Now, put value of "b"

$$(10a + a + 2)(a + a + 2) = 144$$

$$(11a + 2)(2a + 2) = 144$$

Let $a = 2$, $b = 4$

The number is 24.

Part "d"

Solution:

The numbers are $2x$, $3x$

So L.C.M $= 6x = 48$

$$x = \frac{48}{6} \quad 8$$

$$x = 8$$

Now ... y x into $2x$ and $3x$

$2(8) = 16$

$3x = 3(8) = 24$

Now the sum of number is

$16 + 24 = 40$ Ans.

Question no 7

Part "a":

Solution:

Let the number is "x" and "y"

According to the situation:

$$40\% \text{ of } x = \frac{2}{3}(y)$$

$$0.4 = \frac{2}{3} y$$

$$\frac{}{y} = \frac{2/3}{0.4}$$

$$\frac{x}{y} = \frac{5}{3}$$

$$x : y = 5 : 3$$

Part "C"

Solution:

Son's age $= x$

Man's age $= x + 24$

In 2 years $= (x + 24 + 2) = 2(x+2)$

$x + 24 + 2 = 2(x + 2)$

$$x + 26 = 2x + 4$$

$$x = 22$$

Son's age is 22 Ans.