

## SECTION - B

### General Instructions

1. Give numbering to headings
2. Do not write lengthy paragraphs. Write medium sized paragraphs with headings.
3. Do not use table for comparison and contrast questions.
4. Draw figures/diagram/flowchart where needed.
5. Start new question from fresh page.
6. Write unit of the answer in ability section.
7. Explain mathematical steps and the reasoning for better score.
8. Change colour scheme for references to give them more visibility.
9. Manage time well.
10. Wide page borders are discouraged. Should be reasonable.
11. Avoid writing wrong references.
12. Give more weightage to expressly asked part/s of the question.

Q.6. Given Data:  
 Age of Father (F) =  $3 \times$  Age of Son (S)  
 Age of Son (S) = 30 years

Age of Father (F) = ?

- Solution =
1.  $F = 3(S - 5)$
  2.  $F - 5 = 3S - 15$

Putting the value of S =  $\therefore S = 30$

Putting the value of S =

$F - 5 = 3 \times 30$   
 $F - 5 = 90 - 15$

$$F - 5 = 75$$

$$F = 75 + 5$$

$$F = 80$$

Thus, the age of Father (F) is 80 years.

b)

Given Data:

Rate of Income tax      10%  
Amount of Income tax    Rs. 1500  
To find: Income = ?

Solution:

$$\text{Rate} = \frac{\text{Amount}}{\text{Income}}$$

$$10\% = \frac{1500}{\text{Income}}$$

$$\frac{10}{100} = \frac{1500}{\text{Income}}$$

$$\therefore \text{Income} = \frac{100 \times 1500}{10}$$

$$\text{Income} = 15000$$

Thus, the income of the man is Rs. 15000

Q Given Data:

$$\text{Arithmetic Mean} = 20$$

$$\text{Number of items} = 6$$

$$\text{Average of 5 items} = 15$$

To find = Number removed

Solution:-

$$\text{Average} = \frac{\text{Sum of items}}{\text{No. of items}}$$

By putting values,

$$20 = \frac{\text{Sum}}{6}$$

$$\text{Sum} = 120 \quad \text{--- (i)}$$

$$\text{Average} = \frac{\text{Sum of items}}{\text{No. of items}}$$

$$15 = \frac{\text{Sum}}{5}$$

$$\text{Sum} = 75 \quad \text{--- (ii)}$$

$$\text{Number Removed} = (i) - (ii)$$

$$\text{Putting values} = 120 - 75$$

$$= 45$$

Thus, the number is 45.

(d)

(i) 8, 4, 32, 7, 5

Missing one = ?

$$8 \times 4 = 32$$

$$7 \times 5 = 35$$

Reason?

Missing number is 35.

(ii) 17, 19, 23, ... 31, 37

All these numbers are prime numbers.

Thus, prime number after 23 will be 29.

Missing number = 29.

## SECTION. A

Q.2  
a)

### Circulatory system.

#### Definition:

A circulatory system is a system in which blood circulates throughout the living body.

#### Components of a circulatory system.

The circulatory system comprises of:

1. Heart :- An organ which receives blood from body organs and pumps it to the lungs and other body parts.

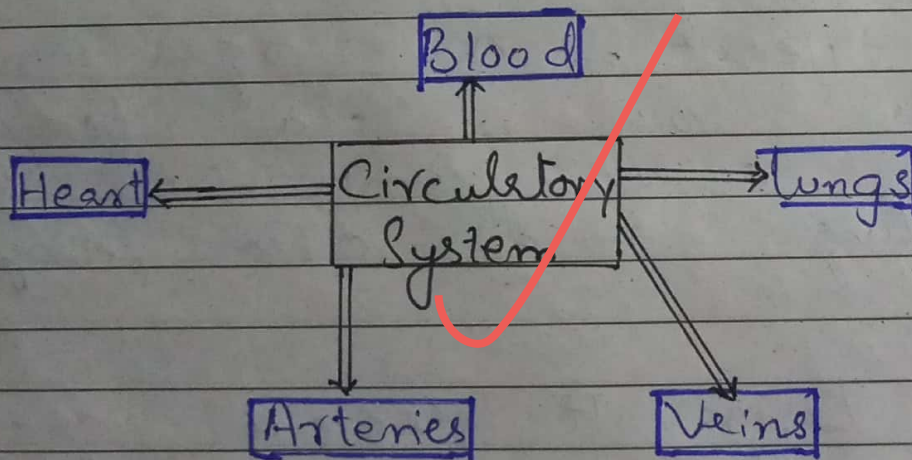
2. Lungs: It receives de-oxygenated blood from heart and sends it back by making blood oxygenated.

3. Blood: It is a connective tissue in fluid form. It carries nutrients and oxygen to body parts. Further it removes carbon dioxide and

wastes from body parts.

4. Arteries: These blood vessels which carry blood away from the heart, sends blood to lungs and other body parts.

5. Veins: These are blood vessels which carry blood towards the heart from lungs and other body organs.



Functions:

The functions of circulatory system includes:

- Transfer of oxygen and nutrients to the body.
- Removal of carbon dioxide and waste materials from the body.

→ Provision of Immunity through  
immune cells contained in blood.

## Role of human heart in Circulation

Human Heart:

Human heart is an important organ which pumps blood throughout the body.

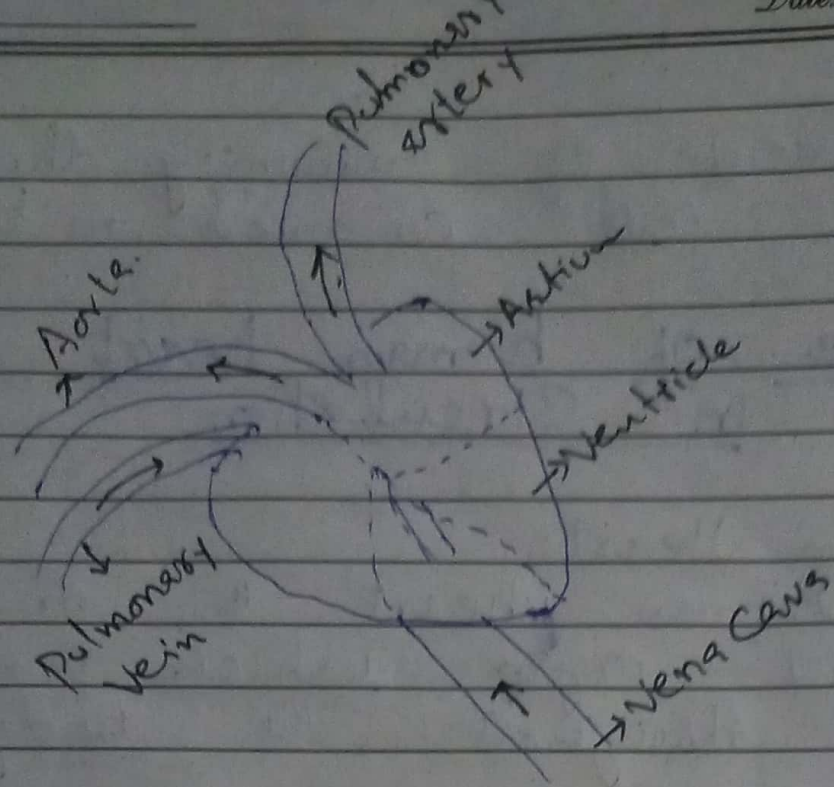
Role in Circulation System:

- Human heart receives deoxygenated blood from body organs through a large vein called Vena Cava.

- That deoxygenated blood is pumped to lungs through pulmonary artery.

- Lungs send oxygenated blood to the heart through pulmonary vein.

- Heart after receiving oxygenated blood send this blood to all body parts through a large artery called Aorta.



## Structure of a human heart

- Human heart has four closed chambers. These chambers prevent the mix of oxygenated and de-oxygenated blood.

Thus, a circulatory system is the system of blood circulation. Human heart stands superior in the system with its specific functions.



b)

# Carbohydrates

## Definition.

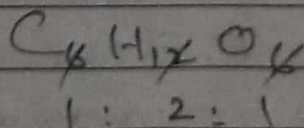
Carbohydrates are the organic molecules, performing various functions for living organisms.

## Structure:

→ The structure of a carbohydrate molecule comprises of Carbon, Hydrogen and oxygen. It means carbohydrates are hydrocarbons in their nature.

→ Carbon, Hydrogen and oxygen are present in 1:2:1 in a carbohydrate molecule.

→ Glucose is the basic unit of carbohydrates. The molecule formula of glucose is  $C_6H_{12}O_6$ . It reveals that,



Carbon, hydrogen and oxygen are present in 1:2:1.

## Functions:

→ Carbohydrates are the main source of energy in plants and animals.

→ The nutrients of living organisms are stored in the form of carbohydrates. Like Starch is the stored food of plants while Glycogen is the stored food of animals.

→ Mainly cell wall of bacterial and plant cells is made up of Cellulose, a carbohydrate.

## Classification

Carbohydrates are mainly divided into three classes on the basis of structure. These are:

### Monosaccharides:

→ 'Mono' means 'one', saccharide means 'sugar molecule'.

→ These contain basic unit called monomer.

→ These are the simplest carbohydrates.

→ These are sweet in taste.

→ Common Monosaccharides are Glucose, Galactose and Fructose.

### Disaccharides:

→ These contain two polymers in their structure.

→ These may be sweet in nature.

→ Common Disaccharides are Lactose, Sucrose and ~~Galactose~~ maltose.

### Polysaccharides:

→ These carbohydrates yield more than ten (10) monomers or sugar molecules.

→ These exist in large chain polymers.

Polysaccharides are usually tasteless in their nature.

→ Common Polysaccharides are Starch, ~~Cellulose~~ Glycogen and Cellulose.

c)

# Water Pollution

## Definition:

Water pollution may be defined as change in physical, biological or chemical features of water due to various reasons, resulting in harmful impacts upon human life and his environment.

## Causes:

Water pollution is caused mainly by reasons described below.

(i) Improper Drainage Systems:  
An open and mis-managed drainage system may pollute under-ground water and water in rivers lakes or oceans.

(ii) Hazardous Industrial wastes:  
The toxic substances of industries and factories is not properly managed

Resultantly, toxic liquids are released into the water bodies.

(iii) Ocean dumping:  
The deposition of solid-waste along marine coasts or oceans cause pollution of marine water.

### Types of water pollution:

The main types of water pollution are:

1. Ground water pollution
2. Surface water pollution.

#### 1. Ground water pollution:

The pollution of ground water is called ground water pollution. This means toxic and hazardous substances are leaked under the surface of earth. That substances have mixed with the available ground water beneath the earth's surface.

## 2. Surface water pollution.

The pollution of water available on the earth's surface is known as surface water pollution.

These include rivers, oceans, lakes and other water bodies available on the surface of earth.

### Impacts:

Water pollution pertains unwanted impacts upon human life and environment. The impacts may be,

it causes diseases like hepatitis, malaris, diarrhoea and others.

It is harmful to living organisms in water bodies.

### Measures:

Managing water wastage from domestic, industrial, and agricultural sources is essential to counter water pollution and its effects.

## d) Liver: Chief Chemist

Liver is the largest gland of human body. It is considered as a chief chemist due to following features:

### Metabolism:

Liver plays important role in chemical metabolism in human body.

### Production of Bile:

Liver produces a liquid, bile. It helps in digestion of food molecules.

### Emulsification of Lipids:

Liver causes emulsification of lipids into small droplets. It eases in the digestion of lipids.

### Removal of toxic substances.

Toxic substances like uric acid, ammonia, bilirubin and other by-products are easily removed from the body through liver.

Chemical modification of  
Drugs and medicines  
are chemically modified  
for their excretion by liver.

Maintenance of body sugar  
levels.

Liver maintains body  
sugar levels upto normal.  
It is done by storing  
surplus nutrients specifically  
carbohydrates (Glucose).

Hence, liver by performing  
various chemical reactions  
basic to body functioning is  
considered as "Chief Chemist"  
of a living body.

Diagram?



Q5. a)

## An Avalanche.

### Definition:

An avalanche is a detached mass of snow, running along the mountainous surface, destroying all in its path.

### Causes:

The main reasons of avalanche may be,

#### 1. Heavy Snowfalls

Continuous and heavy snowfall on a particular point or location causes loose depositions of snow. Thus, new layers may be detached and fall down as an avalanche.

#### 2. Human Activity:

Any activity carried out adjacent to snowy areas may cause an avalanche. Riding snow-bikes, construction works cause friction in these areas. In the result, avalanches are produced.

### 3. wind direction:

wind blows across the snowy mountains may hit the loose snowy masses. It would detach them cause to run down towards the land surface.

### Types of Avalanches:

The main types of an avalanche may be:

1- Large enormous slab of snow:

These are large masses of snow. Their size ranges from 10-100 metres.

2. loose snow masses:

These avalanche are small in their size. Their size ranges from few metres.

### Impacts:

Avalanches pertain harmful effects upon man and his environment.

It causes loss of human lives.

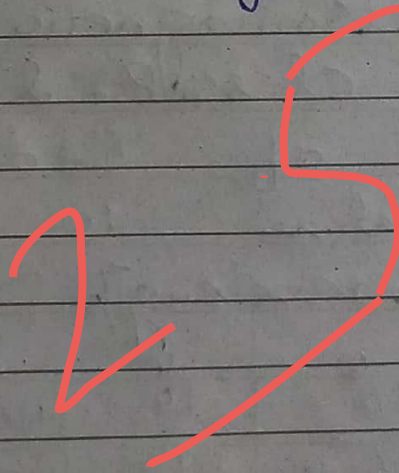
It causes damage to human property like houses and vehicles and so on.

### Managing Avalanche:

Avalanches may be prevented to cause their detrimental effects.

Managing avalanche may include ; restrictions upon human activity, an effective town planning and putting barriers along snowy mountains.

Other types? Diagram?



# Electromagnetic Radiations.

## Description:

Electromagnetic radiations is a set of waves having electromagnetic field. These waves propagate through space. They are travelling at the speed of light while carrying energy and momentum.

## Spectrum:

Electromagnetic radiations are classified into specific pattern of radiations. The classification is usually based upon wavelength and frequency.

$10^8$	$10^6$	$10^4$	$10^2$	1	$10^{-2}$	$10^{-4}$
Gamma rays	X-rays	ultra violet	visible	infr red		radio waves.
$10^{-14}$	$10^{-12}$	$10^{-10}$	$10^{-8}$	$10^{-6}$	$10^{-4}$	$10^{-2}$

Thus, electromagnetic radiations are waves having both electric and magnetic fields. Further, these are classified according to frequency and wavelength.