

SECTION-A

QNO.2

(b)

* CARBOHYDRATES:-

Carbohydrates are the organic compounds that consists of carbon, hydrogen and oxygen. These are also called saccharides. The ratio of hydrogen to oxygen is 2:1. The empirical formula of carbohydrates is $C_m(H_2O)_n$. Carbohydrates provides energy of 3.9 calories per gram.

* Classification of Carbohydrates:-

Following are the classes of carbohydrates:-

- (i) Monosaccharides
- (ii) Oligosaccharides
- (iii) Polysaccharides

(i) Monosaccharides:-

Mono means "one" while Saccharides means "Sugars". Monosaccharides are simplest sugars. In other words, Monosaccharides cannot be hydrolyzed. These are the sweetest among other types and readily soluble in water.

→ Examples:-

Examples include Glucose, Galactose, Fructose

(ii) Oligosaccharides:-

Oligosaccharides yield 2 to 10 molecules of same

or different monosaccharides on hydrolysis. When two monosaccharides are formed, it is called disaccharides. In case of three, it is called trisaccharides and so on. Disaccharides are less sweeter than monosaccharides.

→ Examples:-

(i) Sucrose → Formed from Glucose and Fructose.

(ii) Lactose → Yield Glucose and Galactose

(iii) Maltose → Yield Glucose and Glucose

(iii) Polysaccharides:-

Polysaccharides yield more than 10 molecules of monosaccharides on hydrolysis. If same monosaccharides are formed, it is called homo-polysaccharides. While polysaccharides forming different monosaccharides are called hetero-polysaccharides.

→ Examples:-

(i) Homopolysaccharides → Starch, Glycogen, Pectin, Cellulose

(ii) Hetero polysaccharides → Chondroitin, Hyaluronic Acid

(c)

* Water Pollution:-

The addition of any contaminant or a pollutant into water bodies which degrade the quality of water and makes it unfit for use is called water pollution.

* Types of Water Pollution:-

Following are the types of water pollution:-

(i) Point sources of water pollution

(ii) Nonpoint sources of water pollution:

(i) Point Sources:-

It refers to the contaminants which enter the water bodies through a single and identifiable source.

Examples include sewage from sewage treatment plant, a factory or city drain

(ii) Non point sources:-

It refers to the contaminants which do not originate from a single, identifiable source. An example include leaching out of nitrogen compounds from fertilized agricultural land.

* Causes of Water Pollution:-

Following are the causes of water pollution:-

(i) Household Sewage:-

Waterbodies including lakes, rivers, seas and oceans are polluted by household wastes. Water becomes unfit for daily use. Moreover, the quality of water is so much degraded that it become unsuitable for marine life. According to **UN Environment Program**, 11 million tons of plastics enter oceans annually.

(ii) Agricultural Wastes:-

Farmers use fertilizers and pesticides to improve the production of food. These chemicals are rich in Nitrogen and Phosphorous. When they enter water bodies, it becomes a perfect environment for algal blooms which cause eutrophication.

(ii) Industrial Waste:-

Industrial waste is also one of the cause of water pollution. Everyday industries release harmful chemicals including Arsenic, Carbon, lead, Cadmium etc. into water bodies. They not only affect the quality of water but poses a threat to marine life.

(a)

* Circulatory System:-

Circulatory system transfers or transport nutrients, respiratory gases and metabolic products throughout the living organism. It consists of heart and blood vessels which carry blood towards and away from the heart.

* Heart:-

Human heart is a fist-sized, muscular organ that pumps blood through the body. Heart consist of four chambers:-

- The upper two chambers, right and left atria, receives the blood and carry it towards heart.
- The lower two chambers, right and left ventricles, pumps blood into arteries that carry it away from heart.

* Role of Heart in blood circulation:-

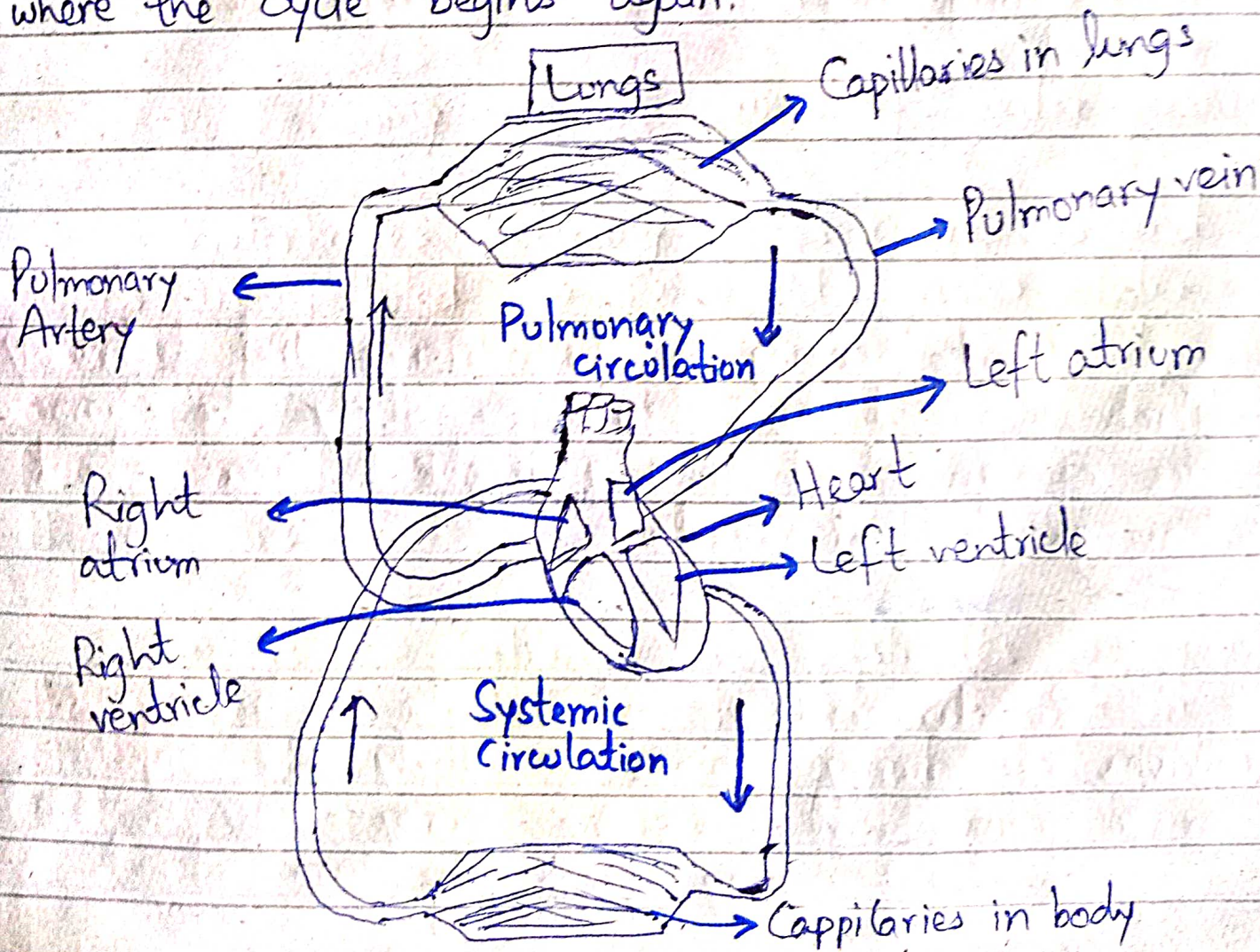
The heart works on the basis of following two types of circulation:-

(i) Systemic Circulation:-

This circuit takes oxygenated blood from the left side of the heart to the body. When the blood returns to the right side of the heart, it is deoxygenated, as the oxygen has been mostly used by the muscles and organs in order to make energy.

(ii) Pulmonary Circulation:-

This circuit takes deoxygenated blood from the right side of the heart, to the lungs where it is oxygenated. It then returns this newly-oxygenated blood to the left side of the heart where the cycle begins again.



(QNO.3)

(d)

* Methods of Food Preservation:-

(i) Heat:-

Heating foods is one of the methods of food preservation. Most bacteria are killed in the range of $82-93^{\circ}\text{C}$. But to completely kill microbes, a temperature of 121°C must be maintained for 15 minutes or longer.

But, sometimes it is not required to kill microbes completely. For instance, in case of pasturized milk.

(ii) Drying:-

Microbes need water to grow. Drying is the procedure through which the growth of microbes can be stopped. Simply, water is removed from food. This also removes water from bacterial cells, inhibiting the growth of microorganisms.

(iii) Sugar and Salt:-

In this method, food like fruits are placed in sugar syrup. Meat is placed in the solution of salt brine. The water from bacterial cells moves into the sugar and salt syrup. The growth of bacteria will be stopped.

An example of this preservation method is pineapple slices in sugar syrup which is available in markets.

(iv) Radiation:-

X-rays, Microwaves, Ultraviolet rays and ionizing radiations are types of electromagnetic radiation that have been used to preserve food. These radiations inactivate enzymes responsible for initiating vegetable sprouting.

(v) Cold:-

Foods can also be preserved by freezing or providing low temperature. Some microbes survive at higher temperatures, even more than boiling point of water. So, to kill those microbes, food is frozen at negative temperature. This inhibits the growth of bacteria, fungi and molds and keeps the food preserved.

(b)

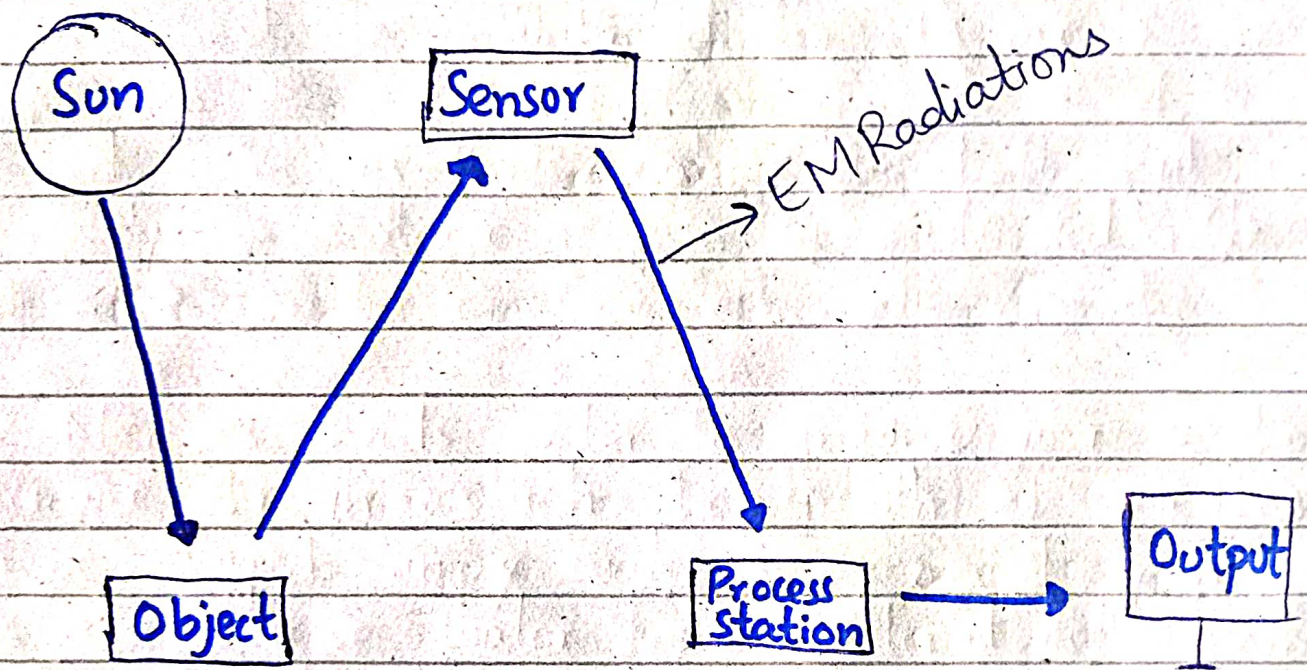
* Remote Sensing:-

Remote Sensing is the science and technology which is used to observe or study the characteristics of an object or a geographical area without having physical contact.

* Process of Remote Sensing:-

Remote sensing captures the electromagnetic waves of energy source to study the objects or a geographical area. The energy source is usually Sun. The light energy from the sun interacts

with the atmosphere and the target object. This electromagnetic radiations are reflected by the object and reaches to remote sensors which collect and record the electromagnetic radiation. The data in electronic form is then sent to processing stations which analyze and interpret the data. The output is displayed on computer screens.



* Applications of Remote Sensing:-

- (i) Altimeters make use of remote sensing for measuring ocean currents.
- (ii) LIDAR (Light Detection and Ranging) is used for vegetation sensing, measurement of concentration of various chemicals in atmosphere.
- (iii) Three-dimensional imagery finds immense importance in examination of deforestation and water quality.
- (iv) Remote sensing is used to keep an eye on the affected areas due to natural hazards.

SECTION-B

(QNO.6)

(c)

Solution:-

\bar{X} of 6 numbers = 20

We can write it as,

$$\bar{X} = \frac{\sum X}{n}$$

$$20 = \frac{\sum X}{6}$$

$$\sum X = 20 \times 6$$

$$\sum X = 120$$

After removal of one number (x),

$$\bar{X} = 15$$

So,

$$\bar{X} = \frac{\sum X - x}{n}$$

$$15 = \frac{120 - x}{5}$$

$$120 - x = 15 \times 5$$

$$x = 120 - 75$$

$$x = 45$$

So, the number is 45.

(b)

Solution

Income tax = Rs. 1500

Income tax = 10%

Income = ?

Let, income of a man is x ,

According to condition,

$$x \times 10\% = 1500$$

$$x = \frac{1500}{10\%}$$

10%

$$x = \text{Rs. } 15,000$$

So, the income of man is Rs. 15000

(d)

(i) 8, 4, 32, 7, 5, 35

$$8 \times 4 = 32$$

$$7 \times 5 = 35$$

(ii) 17, 19, 23, 29, 31, 37

This series is the series of prime numbers.
29 is the next prime number after 23.

(a)

Solution:-

Present age of son = 30 years

Let the age of father = x years

Five years ago,

Age of son = $30 - 5 = 25$ years

Age of father = $x - 5$

According to given condition,

$$x - 5 = 3(25)$$

$$x - 5 = 75$$

$$x = 75 + 5$$

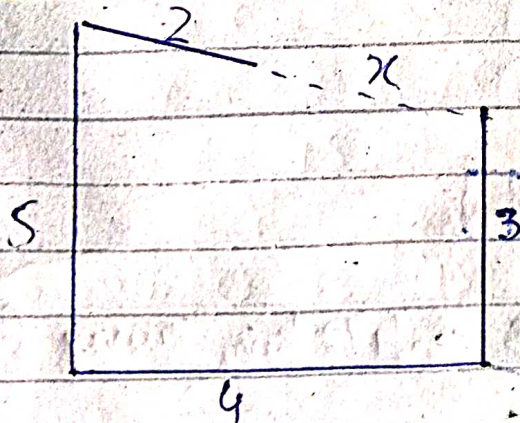
$$x = 80 \text{ years}$$

→ So, the present age of father is 80 years

(QNO.8)

(b)

Solution:-



Distance to North = 5 km

Distance to South = 3 km

Net vertical distance = North - South

$$= 5 - 3$$

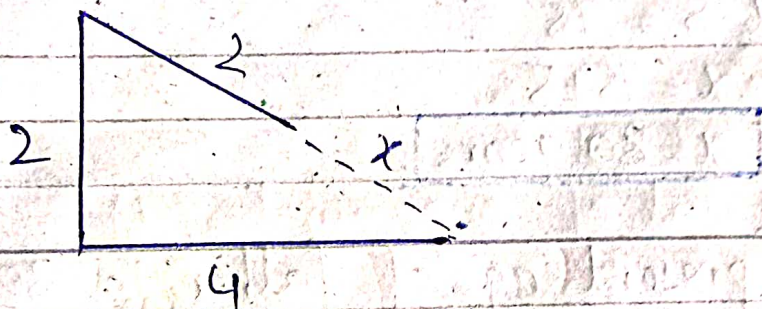
$$= 2 \text{ km}$$

Distance to West = 4 km

Distance to East = 0 km

Net horizontal distance = $4 + 0 = 4$ km

The new figure will be,



According to Pythagoras theorem,

$$\sqrt{(x+2)^2} = \sqrt{4^2 + 2^2}$$

$$x+2 = \sqrt{16+4}$$

$$x+2 = \sqrt{20}$$

$$x = \sqrt{20} - 2$$

or

$$x = 2.472 \text{ km}$$

So, the automobile is 2.472 km away from its starting point.

(d)

Solution:-

Worth of property = Rs. 640,000

Debt = Rs. 40,000

Cost of burial = Rs. 5000

Net cost = 40000 + 5000 = Rs. 45000

Amount to be distributed = 640000 - 45000
= Rs. 595000

According to Islamic law,

Share of Widow = $\frac{1}{8}$

Ratio of share b/w daughter and son = 1:2

Now,

Share of Widow = $\frac{1}{8} \times 595000$

= Rs. 74,375

Remaining amount = 595000 - 74375
= Rs. 520625

Son : Daughter = 2:1

Sum of ratios = 2+1 = 3

Share of son = $\frac{2}{3} \times 520625$

= Rs. 347083.33

Two sons = 2 x 2

= 4

Daughter = 1

Sum of ratios = 4+1 = 5

$$\text{Share of daughter} = \frac{1}{5} \times 520625$$

$$= \text{Rs. } 104125$$

$$\text{Share of 2 sons} = \frac{4}{5} \times 520625$$

$$= \text{Rs. } 416500$$

$$\text{Share of each son} = \frac{416500}{2}$$

$$= \text{Rs. } 208250$$

(a)

Solution:-

Liters	Area (m ²)
↑ 3	24 ↑
↑ x	50.4 ↑

$$\frac{x}{3} = \frac{50.4}{24}$$

$$24x = 3(50.4)$$

$$x = \frac{3(50.4)}{24}$$

$$x = 6.3 \text{ liters}$$

6.3 liters required for 50.4 m² of area.

$$\text{Percentage increase required} = \frac{6.3 - 3}{3} \times 100 \\ = 110\%$$

(c)

Solution:-

$$\text{Tahir's capital} = \text{Rs. } 15,000$$

$$\text{Umar's capital} = 30,000 \times \frac{7}{12} = \text{Rs. } 17,500 \\ (\text{For 7 months})$$

$$\text{Usman's capital} = \cancel{15000} 45000 \times \frac{4}{12} = \text{Rs. } 15,000 \\ (\text{For 4 months})$$

Ratio,

$$\begin{aligned} \text{Tahir : Umar : Usman} &= 15000 : 17500 : 15000 \\ &= 3000 : 3500 : 3000 \\ &= 600 : 700 : 600 \\ &= 6 : 7 : 6 \end{aligned}$$

$$\text{Sum of ratios} = 6 + 7 + 6 = 19$$

$$\text{Profit} = \text{Rs. } 406,000$$

So,

$$\text{Share of Tahir} = \frac{6}{19} \times 406000 = \text{Rs. } 128210.53$$

$$\text{Share of Umar} = \frac{7}{19} \times 406000 = \text{Rs. } 149578.95$$

$$\text{Share of Usman} = \frac{6}{19} \times 406000 = \text{Rs. } 128210.53$$