

General Science And Ability

Section - B

Question - 6

a- The value of a washing machine depreciates at a rate of 10-percent every year. If its present value is rupees 8748 then what was the price of washing machine three years ago?

Solution :

Present value = Rs. 8748

Depreciation rate = 10% = 0.10

Price three years ago

$$P = \frac{V}{(1 - r)^n}$$

$$P = \frac{8748}{(1 - 0.10)^3}$$

$$P = \frac{8748}{(0.90)^3}$$

$$P = \frac{8748}{0.729}$$

$$\frac{0.729}{1000}$$

$$\frac{8748000}{10000}$$

$$729 \overline{) 874800}$$

$$729$$

$$\underline{1458}$$

$$1458$$

①

$$729$$

$$\underline{2}$$

$$1458$$

$$P = 12,000$$

So,

the price of washing machine three years ago was Rs. 12,000

b- A Father is four times the age of his daughter. If after 5-years he would be three times of daughter's age, then further after 5 years, how many times he would be of his daughter?

Solution:

Let, the age of Father and Daughter as F and D .

Father age after 5 years

$$4D + 5 = 3(D + 5)$$

$$4D + 5 = 3D + 15$$

$$4D - 3D = 15 - 5$$

$$D = 10$$

So,

The current age of daughter is 10 years and that of father is 40-years

From present age to after five years and further five years, total 10-years

$$\text{Age of daughter} = D + 10 = 10 + 10 = 20 \text{ years}$$

$$\text{Age of Father} = 40 + 10 = 50 \text{ years}$$

Times the age of daughter from her father ::

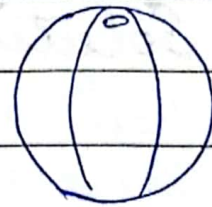
$$\text{Times} = \frac{\text{Age of Father}}{\text{Daughter Age}}$$

$$= \frac{50}{20} = \boxed{2.5 \text{ times}}$$

C- What will be the volume of a football with diameter 12cm?

Solution:

A football is of sphere shape. So, the volume is given by



$$V = \frac{4}{3} \pi r^3$$

$$\text{Diameter} = 12 \text{ cm}$$

$$\text{Radius} = 6 \text{ cm}$$

$$V = \frac{4}{3} \left(\frac{22}{7} \right) (6)^3$$

$$\begin{array}{r} 36 \\ 6 \\ \hline 216 \end{array}$$

$$V = \frac{4}{3} \left(\frac{22}{7} \right) (216)$$

$$\begin{array}{r} 82 \\ 3 \overline{) 216} \\ \underline{21} \\ 6 \end{array}$$

$$V = \frac{4 \times 22 \times 72}{7}$$

$$4 \times \frac{22 \times 72}{7}$$

$$V = \frac{6336}{7}$$

$$\frac{22}{9}$$

$$V = 95.14 \text{ cm}^3$$

$$\begin{array}{r} 188 \\ 72 \end{array}$$

$$\begin{array}{r} 176 \\ 616 \times \\ \hline 6336 \text{ sec} \\ \hline 63 \end{array}$$

$$\begin{array}{r} 36 \\ 35 \\ \hline 1 \\ \hline 30 \\ \hline 28 \\ \hline 2 \end{array}$$

d- Two trains moving in opposite directions cross a man standing on the platform in 27 seconds and 17 seconds respectively and they cross each other in 23 seconds. What is the ratio of their speeds.

Solutions:

Train 1 = 27 sec

Train 2 = 17 sec

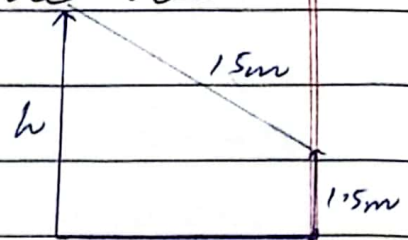
Combine crossing time 23 sec

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

Question - 8

a- Ali is standing 10 meters away from a tree. The distance of his eyes from his feet is 1.5m. Given that the distance from his eyes to the top of the tree is 15m. Find the height of the tree.

Solution:



From Pythagoras' Theorem

$$(15)^2 = (10)^2 + (h - 1.5)^2$$

$$225 = 100 + (h - 1.5)^2$$

$$225 - 100 = (h - 1.5)^2$$

$$125 = (h - 1.5)^2$$

$$5\sqrt{5} = h - 1.5 \quad (\text{By taking sq.})$$

$$h = 1.5 + 5\sqrt{5}$$

$$h = 1.5 + 5(2.23)$$

$$h = 1.5 + 11.15$$

$$h = 12.65 \text{ m}$$

$$\begin{array}{r} 2.5 \\ 2.5 \\ \hline 12.5 \\ \times \end{array}$$

$$\begin{array}{r} 2.23 \\ 2.23 \\ \hline 11.15 \end{array}$$

$$\begin{array}{r} 11.15 \\ 1.5 \\ \hline 12.65 \end{array}$$

b- Correct word from jumbled word

SONCCVOISIENT CONSCIENTIOUS

EIVENPRRAOST PRESERVATION

UORSIULDC

UNSPRESE

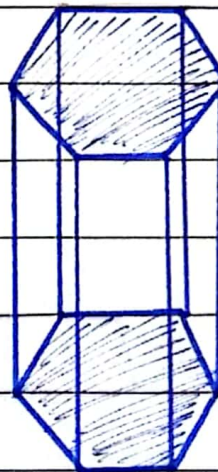
NMILAOPC COMPLAIN

c- Draw and write the total numbers of lines of symmetry in a regular hexagon and octagon. How many lines of symmetry are there in a circle?

Solution:

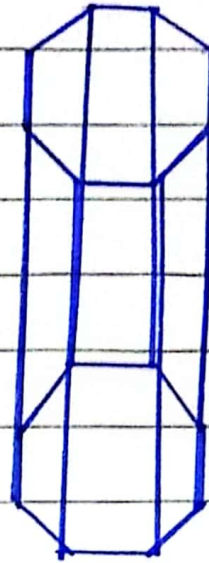
Hexagon :-

A regular hexagon has 6 lines of symmetry. 3 lines passing through the 3 vertices of opposite sides.



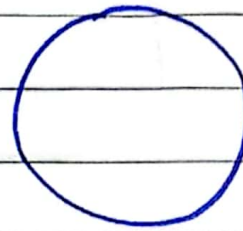
Octagon:-

A regular octagon has 8 lines of symmetry, passing through the opposite 8 lines vertices.



Circle:

A circle has infinity of lines of symmetry because every line passing through it cut it into two halves.

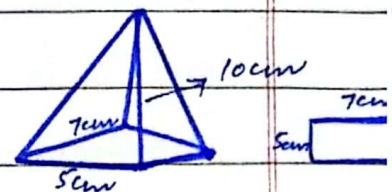


d- If the base of the pyramid is rectangular having length is 7cm and the width is 5cm and the height of the pyramid is 10cm, then find its volume.

Solution:

Volume of Pyramid

$$= \frac{1}{3} (\text{Base Area})(\text{Height})$$



$$\begin{aligned} \text{Base Area} &= \text{length} \times \text{width} \\ &= 7\text{cm} \times 5\text{cm} \\ &= 35\text{cm}^2 \end{aligned}$$

Now,

$$\begin{aligned} \text{Volume} &= \frac{1}{3} (35) (10) \\ &= \frac{1}{3} (350) = 116.666\text{cm}^3 \end{aligned}$$

116.6
 350.0
 3
 5
 3
 20
 18
 20
 18
 2

Volume of Pyramid
 = 116.67 cm³

Section - A

Question - 3

a - What are the proteins and carbohydrates? Give their digestion.

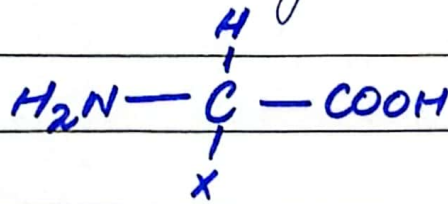
Proteins:

Proteins are most abundant in human body. Human body's dry cell comprises of 50% of proteins. Proteins are the derivatives of amino acids.

Thousands of amino acids join to form a polypeptide chain to make one unit of protein molecule.

Amino Acids :

Amino acids are the building blocks of protein. About 117 amino acids have been discovered. Out of which 25 required for the human body.



where, X comprises of group of elements depending on the property of amino acids.

Function of Proteins :

- i- All enzymes are protein helping as the catalyst for a reaction.
- ii- Protein as hemoglobin act as a carrier and transport oxygen in blood.
- iii- Other proteins enhance the metabolism of body.

iv- Some proteins play structural role in human body e.g Keratin present in nails and hair.

Types of Protein

Globular Proteins

- They are formed from quaternary structure of protein

e.g Enzymes, hormones, hemoglobin, antibodies in blood.

Fibrous Proteins

- They are formed from tertiary or secondary structure of protein.

e.g silk fibres, keratin, myosin in muscles.

Digestion of Protein

Proteins are the derivatives of the amino acids / polypeptide chain.

For the digestion of protein in stomach, an enzyme is present called Pepsin.

It breakdowns larger molecules of protein into smaller ones and

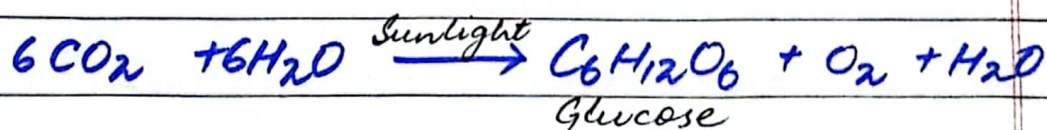
promotes digestion of proteinaceous food.

Carbohydrates

Carbohydrates are the major constituent of human body, made of carbon, hydrogen and oxygen. Chemically, they are defined as

Polyhydrony of aldehydes and ketones.

They are form in plants and animals. In plants they are the product of photosynthesis



Glucose is an aldose sugar, form during the process of photosynthesis.

In human body, Glycolysis cycle breaks the glucose molecules for the production of energy in the form of **ATP**.

Types of Carbohydrates

- Monosaccharide
comprises of 2-9 units of C-atoms. e.g. glucose, fructose
- Oligosaccharide
comprises of two units of monosaccharide e.g. maltose, lactose
- Polysaccharide
comprises of 3 to upto thousands units of monosaccharide. e.g. starch and cellulose.

Functions of Carbohydrates

- 1- Carbohydrates provide energy to body by the breakdown of glucose.
- 2- Carbohydrates as cellulose used in textile industry, as cotton is a pure cellulose.
- 3- Carbohydrates plays structural role in body as they provide support to cell wall in plants.
- 4- Dietary fibres, promotes digestion and supports body.
- 5- Carbohydrates boosts up the immunity.

Digestion of Carbohydrates

Carbohydrates digest partially in the oral cavity. by the presence of enzyme called **Amylase**.

This enzymes partially breaks the carbohydrate in mouth.

Rest of the digestion occurs in the stomach. different enzymes such as **Lactase**, **maltase**, **Sucrose** are there and they promote the digestion.

(b)

Explain Atmospheric Pressure, Temperature and Humidity.

Atmospheric Pressure

Atmosphere pressure is define as the

"Force exerted by the weight of the air in the Earth's atmosphere."

It is measured as force per unit area. $P = \frac{F}{A}$

Unit to measure Atmospheric Pressure

The unit of Pressure is Pascal (Nm^{-2}). For atmospheric pressure it is measured in

atm or Hgmm

$$1 \text{ atm} = 101325 \text{ Pa}$$

$$1 \text{ atm} = 760 \text{ mm Hg} / 1 \text{ torr}$$

Instrument for measurement

Barometer is used to measure the atmospheric pressure.

Factors Affecting Atm. Pressure

Atmospheric pressure varies with

→ **Attitude:** It decreases as attitude increases.

→ **Weather Condition:** Like clear sky bring high-pressure, cloudy weather have low atmospheric pressure

Temperature

Temperature is define as

"The degree of hotness
or coldness of a body"

It is the average kinetic energy
of a molecules of air in the
atmosphere.

Factors Affecting Temperature

Position of Equator:

Areas near equator receive more
sunlight and are warmer.

Altitude:

At high altitude Temperature
decreases as the pressure increases.

Seasons:

Temperature depends on the
seasonal cycles and weather conditions.

Measuring Scales:

Temperature is measured by
three scales

→ Celsius ($^{\circ}\text{C}$)

→ Fahrenheit ($^{\circ}\text{F}$)

→ Kelvin (K)

The instrument which is used to measure temperature is **Thermometer**.

Humidity

Humidity is defined as:

The amount of moisture content present in the air.

It is because of the water vapour content of the air.

Types

Absolute Humidity

- The actual amount of water vapours in the air

Relative Humidity

- The percentage of water vapours relative to the maximum amount air can hold.

Units of measurement and instrument

- Absolute humidity is measured in grams per cubic meter of water vapours (g/m^3)
- Relative humidity is measured as Percentage (%)
- Instrument for the measurement of humidity is **hygrometer**

(C)

Explain the phenomenon of Earthquake with diagrams.

Earthquake

An earthquake is a sudden shaking or trembling of the Earth's surface caused by the movement of the tectonic plates or sudden volcanic eruption from the Earth's

crust. The sudden and abrupt release of energy causes the surface of Earth to tremble. Stress builds up in the rocks due to tectonic forces, when the stress exceeds the strength of the rock, they fracture and release energy in the form of the **Seismic waves**.

Focus of Earthquake

- The point on the Earth where earthquake originates is called the focus or Hypocenter.
- The point on the Earth's surface directly above the focus is called Epicenter.

Tectonic Plates Movement

• Subduction Zone

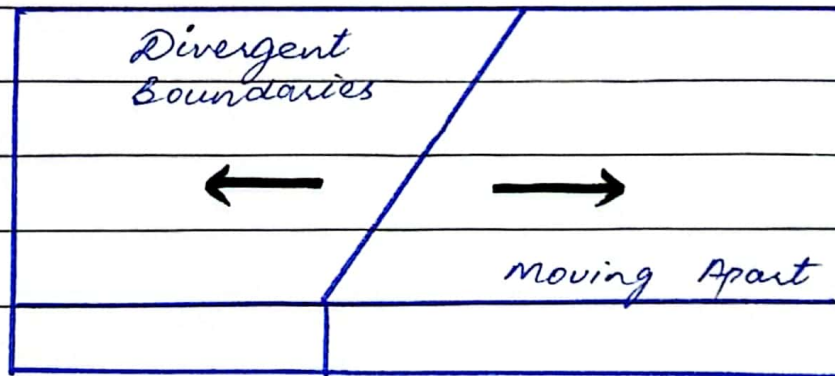
This occurs where tectonic plate is forced underneath the Earth's mantle. The immense pressure

and friction generated at these convergent boundaries and can cause powerful earthquake.

• Divergent Boundaries

These occur where tectonic plates are moving apart. Magma rises to fill up the gap and the crust fractures as it pulls apart, causing Earthquake.

Mid-Atlantic Ridge is the example of divergent boundaries



• Convergent Boundaries

When two plates come together the impact of colliding plates may bend down into a deep seafloor trench. Volcanoes often

form parallel to convergent plates.

