

Section - I

Question #4

(A) Distinguish the following terms in one sentence.

i) Cyclone and Tornadoes

A cyclone is a large, violent storm with strong winds that spiral around a low-pressure center; whereas, tornadoes are violently rotating column of air extending from a thunderstorm to the ground.

ii) Hypocenter and Epicenter

Hypocenter (Focus) is the point within the earth where an earthquake originates, while epicenter is the point on the earth surface that is exactly above the hypocenter.

iii) GPS and GIS

GPS (Global Positioning System) is a satellite-based navigation system that provides information about location and time; on the other hand, GIS (Geographic Information System) is a computer based system that help in storing, analyzing, and visualizing data for geographic information.

iv, RAM and ROM

RAM (Random Access Memory) is a volatile memory that is used for temporary storage of data, whereas ROM (Read-Only Memory) is non-volatile memory that stores data permanently.

v) Pesticides and insecticides

Pesticides are chemical substances used to kill pests, like fungi, insects, rodents, and weeds; however, insecticides are chemical substances that are used to kill only insects.

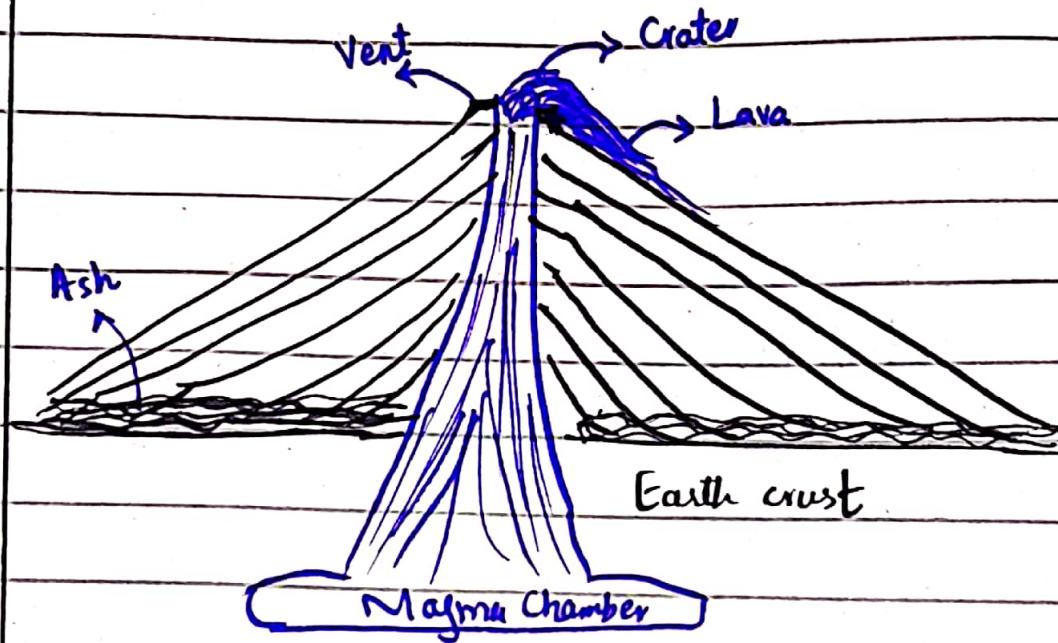
(b)

Process of volcanic eruption

↳ Volcanic eruption

Volcanic eruption refers to sudden and powerful release of magma, molten rock, and gases onto the surface of earth through a vent on the earth's crust.

↳ How volcanic eruption occur?



i) Magma generation

The process of volcanic eruption starts with magma generation. The magma generate deep down the earth when high pressure and heat cause rock to melt, forming magma. And this magma starts to rise.

ii) Magma accumulation and pressure

The rising magma collects in a large underground reservoir called magma chamber. With magma collection, the chamber swells and builds up pressure.

iii) Eruption stage

The magma is often saturated with gases. When the gases, like CO_2 , exert pressure, the highly explosive magma erupts out as lava on the surface of the earth.

(c)

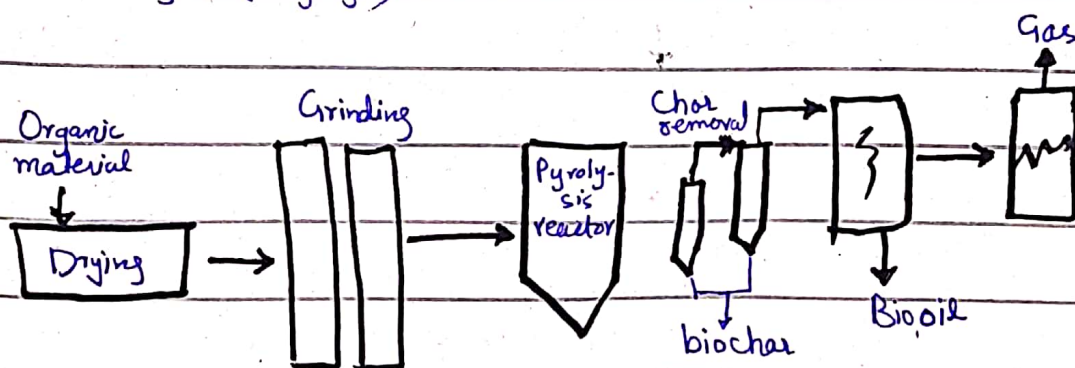
Pyrolysis, incineration, and composting in SWM

Pyrolysis, incineration, and composting are methods used for solid waste management.

These methods are discussed below:

↳ Pyrolysis

It is a thermochemical process that breaks down organic matter using heat in the absence of oxygen. Instead of burning, the material undergoes a chemical change, decomposing into liquid (pyrolysis oil), solid (biochar), and gas (syngas).

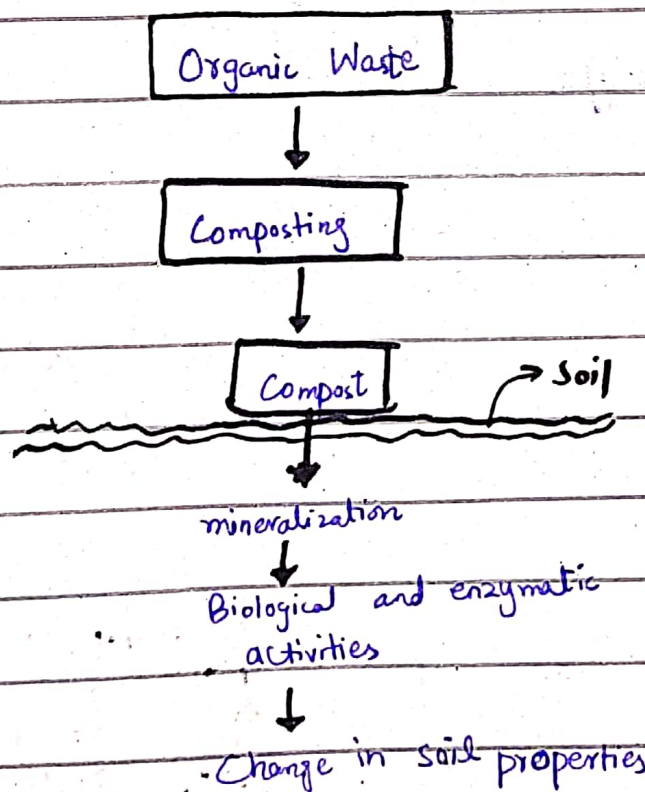


↳ Incineration

Incineration is that method of solid waste management in which waste is burned on high temperature to reduce to volume and convert it into gas, ash, and heat.

↳ Composting

Composting is aerobic biological conversion of organic waste into compost by micro-organisms in the presence of oxygen, water, and nitrogen.



(d)

↳ Balance diet

Balance diet refers to that diet which includes the right amount of all the nutrients, such as proteins, carbohydrates, vitamins, minerals, fats, etc.

↳ Components of balance diet

The components of balance diet include

- i) Carbohydrates is main source of energy.
- ii) Proteins are important for growth
- iii) Fats give energy.
- iv) Vitamins play essential role in chemical processes
- v) Minerals are important for body's normal functioning

↳ Importance of balance diet

- 1) The body gets a steady supply of energy from stored glycogen through balance diet, which helps maintain energy levels.
- 2) A balance diet rich in vitamins and minerals help in building strong immune

system that rapidly activates for body's defense.

3, Balance diet also helps in proper growth and development of a body. For example, protein like keratin help in hair and nails growth.

4, Moreover, balance diet also help in digestive system. Like dietary fibers ^{help in} easy digestion, ultimately helping in bowel movement and preventing constipation.

5, Balance diet also helps in managing high blood pressure, which reduces the risk of serious diseases, like cardiac disease and diabetes -



Question #5

b) Different renewable energy resources under CPEC

CPEC is a flagship project between Pakistan and China. In this project, investments on renewable energy resources in Pakistan is also included. The different energy resources under CPEC are wind energy, solar energy, and hydal energy.

↳ Renewable energy resources

Renewable energy resources are those energy resources which do not end when used, and they can be use again and again.

↳ Different ^{renewable} energy resources under CPEC

1) Hydropower energy

In this form, energy is produced from the force of moving water, often from dams. Under CPEC, the projects, like Suki Kinari Hydropower project and Azadpathan Hydropower

project, have been started.

2, Wind energy

In this form of energy, power is generated from the kinetic energy of wind, typically captured by wind turbines.

For example, Jhimpir Wind Power project and Sachal Wind Farm.

3, Solar energy

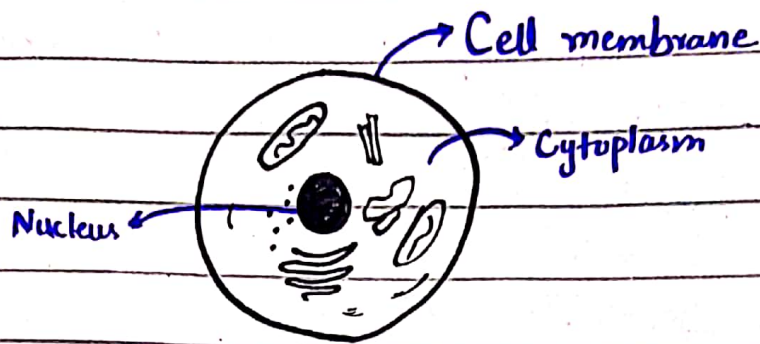
In this form, energy is harnessed from the sun rays using technologies like photovoltaic solar panels. For example, Quaid-e-Azam Solar Park in Bhawalpur has started under CPEC.

(C) Parts of cell in human body

↳ Definition of cell

Cell is defined as the basic functional and structural unit of living organisms.

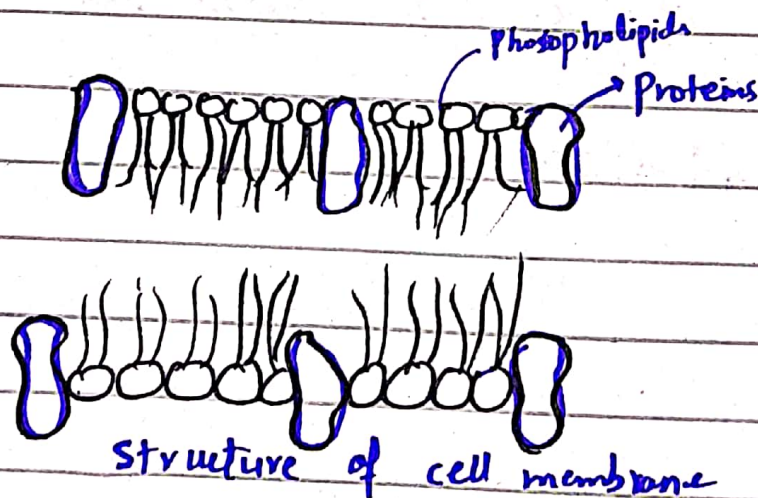
The parts of cell include cell membrane, cytoplasm, and nucleus.



↳ Parts of cell

↳ Cell membrane

Cell membrane is the outermost semi-permeable layer of a cell. It separates cell's inner from the surrounding environment. Cell membrane is also called plasma membrane. It also acts as a boundary between two cells. The major function of cell membrane is to provide protection and allow the entry and exit of substances.

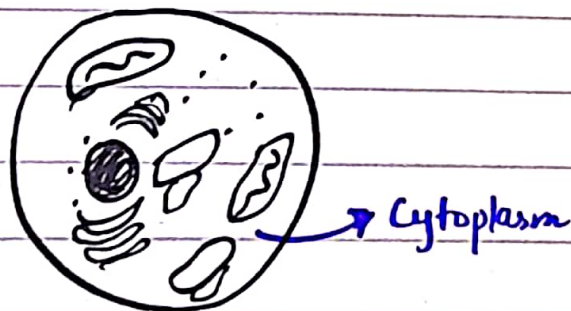


Cell membrane is composed of carbohydrate, lipids,

proteins, and phospholipids. Fluid Mosaic model explains the structure of cell membrane.

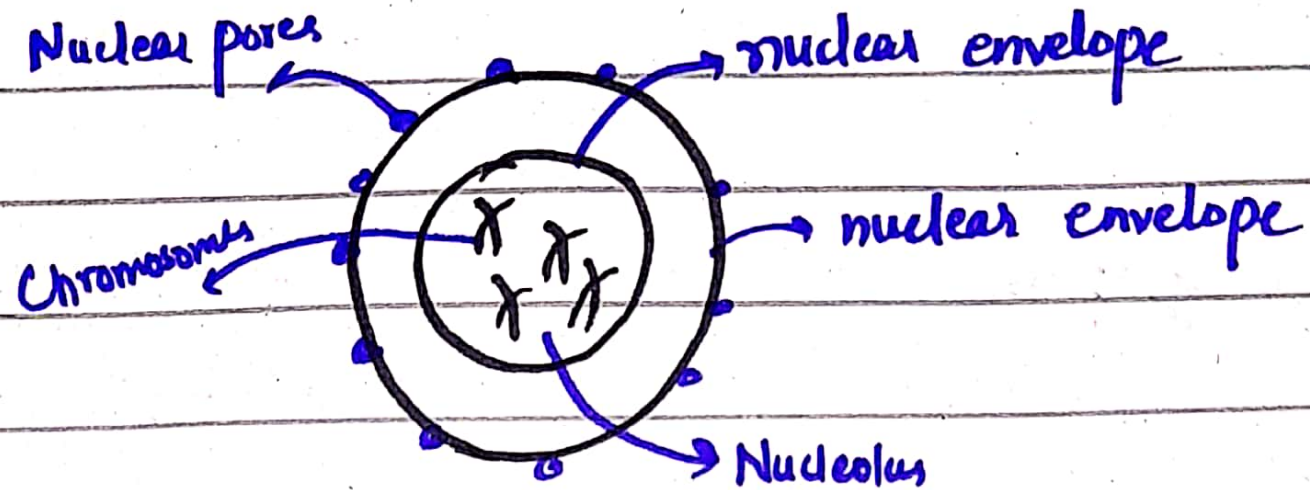
↳ Cytoplasm

Cytoplasm is a clear, jelly-like substance in the cell between the cell membrane and nucleus of a cell. The soluble part of cytoplasm is called cytosol. All organelles of cell are present in the cytoplasm. A cytoplasm facilitate chemical process. Other metabolic process like glycolysis also occur in a cytoplasm.



↳ Nucleus

Nucleus is the largest membrane-bound organelle with $6\mu\text{m}$ of diameter. It is store house of DNA, a hereditary material. It has nuclear-membran, which provides protection, nuclear envelope, nuclear pore, and nucleolus.

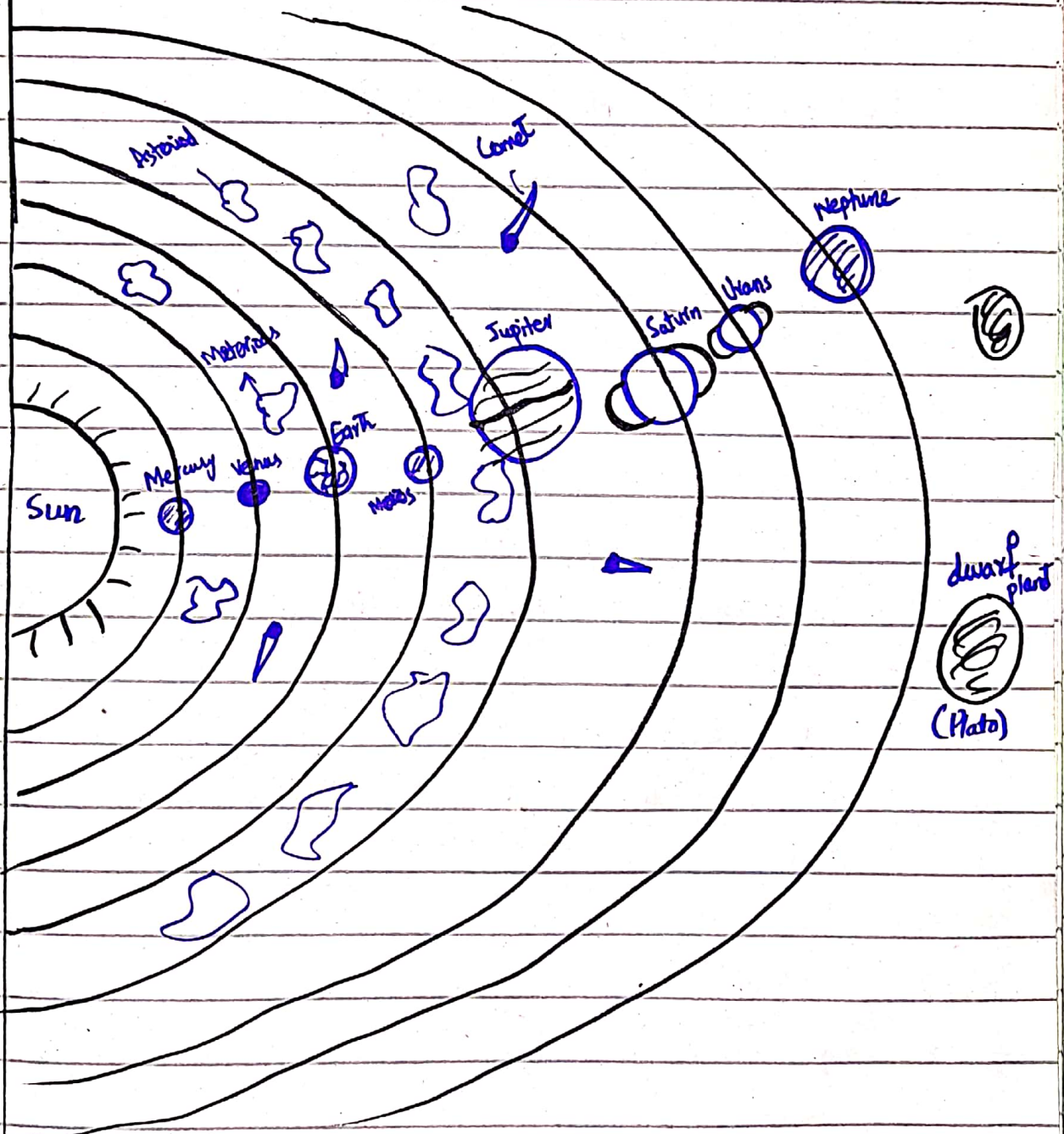


Structure of Nucleus

(d)

Draw parts of solar system

The parts of solar system
include the Sun, eight planets,
dwarf planets, asteroid, meteoroids,
and comet.



Section - II

Question #8

(A)

Given data:

Sara walked 10 meters towards east

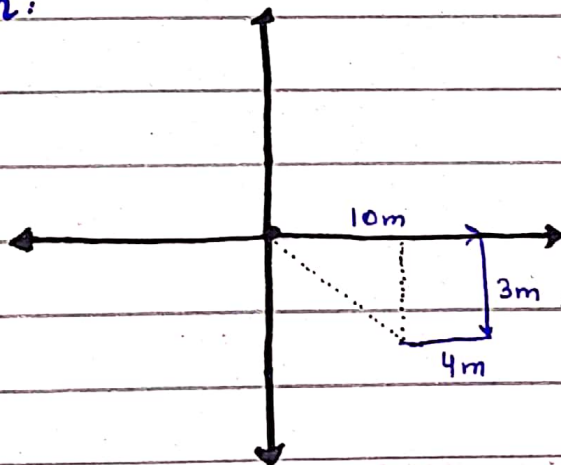
Then turned right and walked 3 meters

Again she turned right and walked 4 meters

To find:

How far she is from initial point = ?

Solution:



Lets solve it by the help of pathagoras theorem

$$(\text{Hyp})^2 = (\text{Base})^2 + (\text{Perp})^2$$

$$\text{Let base} = 10 - 4$$

$$= 6\text{m}$$

$$\text{Perpendicular} = 3\text{m}$$

$$\text{Hypotenuse} = ?$$

Put the values in formula

$$(\text{Hyp})^2 = (6)^2 + (3)^2$$

$$(\text{Hyp})^2 = 36 + 9$$

$$(\text{Hyp})^2 = 45$$

$$(\text{Hyp})^2 = 3^2 \times 5 \quad (\text{Taking square root on both sides})$$

$$\sqrt{(\text{Hyp})^2} = \sqrt{3^2 \times 5}$$

$$\text{Hyp} = 3\sqrt{5}$$

$$\text{Hyp} = 3 \times 2.23$$

$$\text{Hyp} = 6.69 \approx 6.7$$

$$\begin{array}{r} 2.23 \\ 2 \overline{) 5} \\ \underline{+ 2} \\ 4 \\ \underline{+ 2} \\ 44 \\ \underline{3} \\ 1329 \\ 271 \end{array}$$

Thus, Sarah is 6.7 meters far from her initial point.

(b)

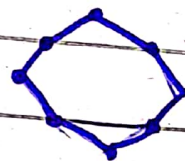
Given data

Each side of octagon = 5cm

Octagon has 8 sides

To find

Perimeter of a regular octagon



Each angle of octagon

Solution

Formula to be used:

$$\text{Perimeter} = 8 \text{ Sides}$$

$$P = 8(5)$$

$$P = 40 \text{ cm}$$

So, the perimeter of a regular octagon is 40 cm

(C)

Given data

$$\text{Green balls} = 6$$

$$\text{Yellow balls} = 10$$

$$\begin{aligned} \text{Total balls in a box} &= 10 + 6 \\ &= 16 \end{aligned}$$

To find

Probability of yellow ball = ?

Solution:

Number of possible outcomes for yellow balls = 10

Formula

$$\text{Probability} = \frac{\text{No. of possible outcomes of yellow balls}}{\text{Total number of balls}}$$

Putting values in the given formula

$$\text{Probability} = \frac{10^5}{168}$$

$$\text{Probability} = \frac{5}{8}$$

$$8 \overline{) 50} \begin{array}{r} 0.62 \\ 48 \\ \hline 20 \\ 16 \\ \hline 4 \end{array}$$

$$\text{Probability of yellow ball} = 0.62$$

(d)

Given data:

$$\text{MADRAS} = \text{NBESBT}$$

To find:

$$\text{BOMBAY} = ?$$

Solution:

The code follows the +1 shift in English alphabets
Therefore,

$$\text{BOMBAY} = \text{CPNCBZ}$$



Question #7

(a)

$$i) 11, 13, 17, _, 23$$

The given series follow the pattern
of prime numbers.

Thus, the missing number is 19

$$11, 13, 17, 19, 23 \text{ Ans}$$

ii) 10, 28, 91, 370, _____

The given sequence follows the pattern of continuously increasing multiplier and a continuously decreasing added value.

$$\begin{array}{ccccccc} 10 & 28 & 91 & 370 & ? \\ \swarrow & \swarrow & \swarrow & \swarrow & \\ \times 2 + 8 & \times 3 + 7 & \times 4 + 6 & \times 5 + 5 & \end{array}$$

$$10 \times 2 = 20 + 8 = 28$$

$$28 \times 3 = 84 + 7 = 91$$

$$91 \times 4 = 364 + 6 = 370$$

$$370 \times 5 = 1850 + 5 = 1855$$

So, the missing number is 1855

(b)

Given data

$$\text{Total shirts} = 35$$

$$\text{Price of each shirt} = \text{Rs. } 280$$

$$\text{Each shirt sold at} = \text{Rs. } 308$$

To find

Percentage profit = ?

Solution

$$\begin{aligned}\text{Price of 35 shirt} &= 35 \times 280 \\ &= \text{Rs. } 9800\end{aligned}$$

$$\begin{aligned}\text{Price of 35 shirt sold} &= 35 \times 308 \\ &= \text{Rs. } 10780\end{aligned}$$

Formula used

$$\text{i) Profit amount} = \text{Sold price} - \text{Cost price}$$

$$\text{ii) Profit \%} = \frac{\text{Gross profit}}{\text{Cost price}} \times 100$$

Put values in formula (i) to find profit.

$$\begin{aligned}\text{Profit} &= 10780 - 9800 \\ &= \text{Rs. } 980\end{aligned}$$

To find profit %, put values in formula (ii)

$$\text{Profit percentage} = \frac{980}{9800} \times 100$$

$$\text{Profit percentage} = \frac{100}{10}$$

$$\boxed{\text{Profit \%} = 10\%} \quad \text{Ans}$$

(C)

Given data

^

Actual age of a child = 10 years

Chronological age of a child = 12 years

To find

IQ of a child = ?

Solution

Formula used

$$IQ = \frac{\text{Mental age}}{\text{Chronological age}} \times 100$$

Here mental age = Actual age

To find IQ, put values in the given formula

$$IQ = \frac{10}{12} \times 100$$

$$IQ = 0.833 \times 100$$

$$IQ = 83.3$$

So, the total IQ of a child is 83.3