

GSA

Part II

Section I

Qno 3

(1)

Explain and Draw the structure of sun.

Sun:

Sun is a star and center of our solar system.

Planets in our solar system revolve around the sun.

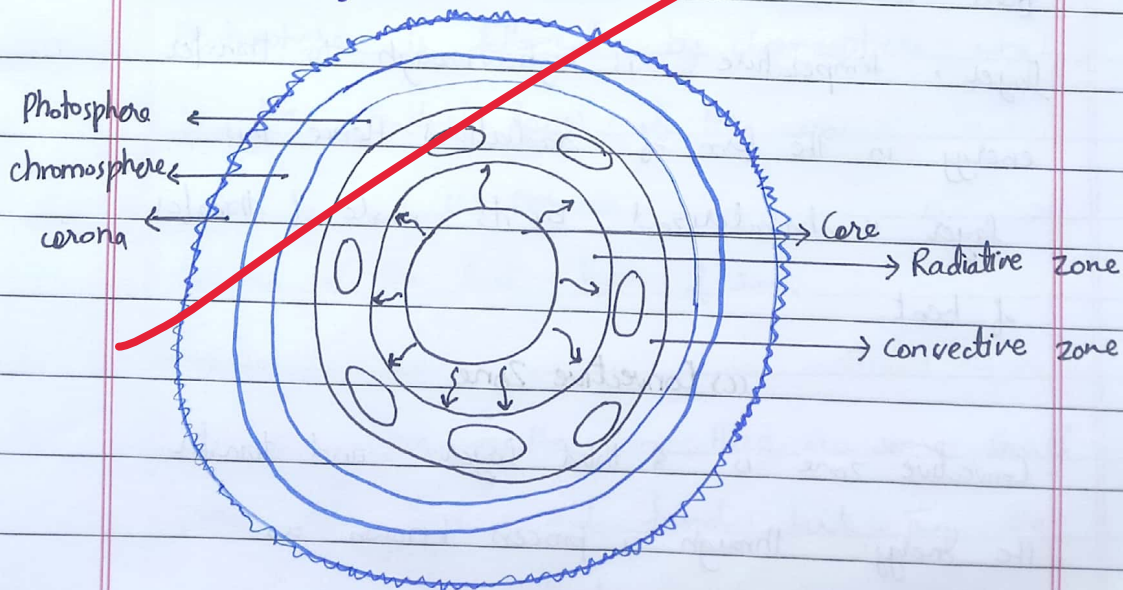
It contains approximately 98% ^{mass} of our solar system.

Inside the sun, fusion reactions occur through which heat or energy is generated is transferred

to the earth in the form of sunlight. It is

composed of mainly two types of gases hydrogen & helium

Structure of Sun



The structure of sun composed of two types of layers: inner layers and external layers.

(1) Inner layers:

Inner layers of sun are core, radiative zone, and convective zone.

(a) Core

Core is the innermost part of the sun. It is the region where fusion reaction takes place to produce energy. Four hydrogen atoms ^{fused} compose to form 1 Helium atom. The process is continuous; therefore, the sun provides sunlight to the earth continuously.

(b) Radiative Zone

Radiative zone is layer outside the core. Its name is based on its mode of heat transfer from the core to outward the sun. In this layer, temperature is high enough to transfer energy in the form of radiations. Hence, this layer is characterized by its mode of transfer of heat.

(c) Convective Zone

Convective zone is the third layer and transfer the energy through a process known as

convection. This layer becomes cool enough to transfer heat in the form of convection. In the process, the plasma traps heat from inside and carries outward the sun surface in the form of bubbles. When these bubbles escape the heat, they come back inside to trap more heat.

(ii) Outer layers:

Outer layers of sun are photosphere, chromosphere, and corona.

(a) Photosphere

Photosphere is the visible part of the sun. It is bright yellowish layer. It starts from the edge of convective zone and ends till the layer of chromosphere starts.

(b) Chromosphere

Photosphere is followed by chromosphere which is the hottest layer of the sun.

(c) Corona

Corona is the last layer of sun:

Sunspots:

On the surface of the sun, there are some small pores like structures and found dark. They are intense involved in solar activity.

(iii)

Environmental Pollution:

Environmental pollution can be defined as the addition of unnecessary, harmful pollutants as a result of human activity which cause adverse impacts on humans and environmental health.

Example: Addition of harmful gases such as CO_2 into the environment.

Types of Environmental Pollution

As the environment is divided into three different zones, pollution of every zone can be classified separately. There are three major types of pollution.

(a) Air Pollution: Air pollution, also called as atmospheric pollution, is the addition of harmful pollutants into the atmosphere of earth.

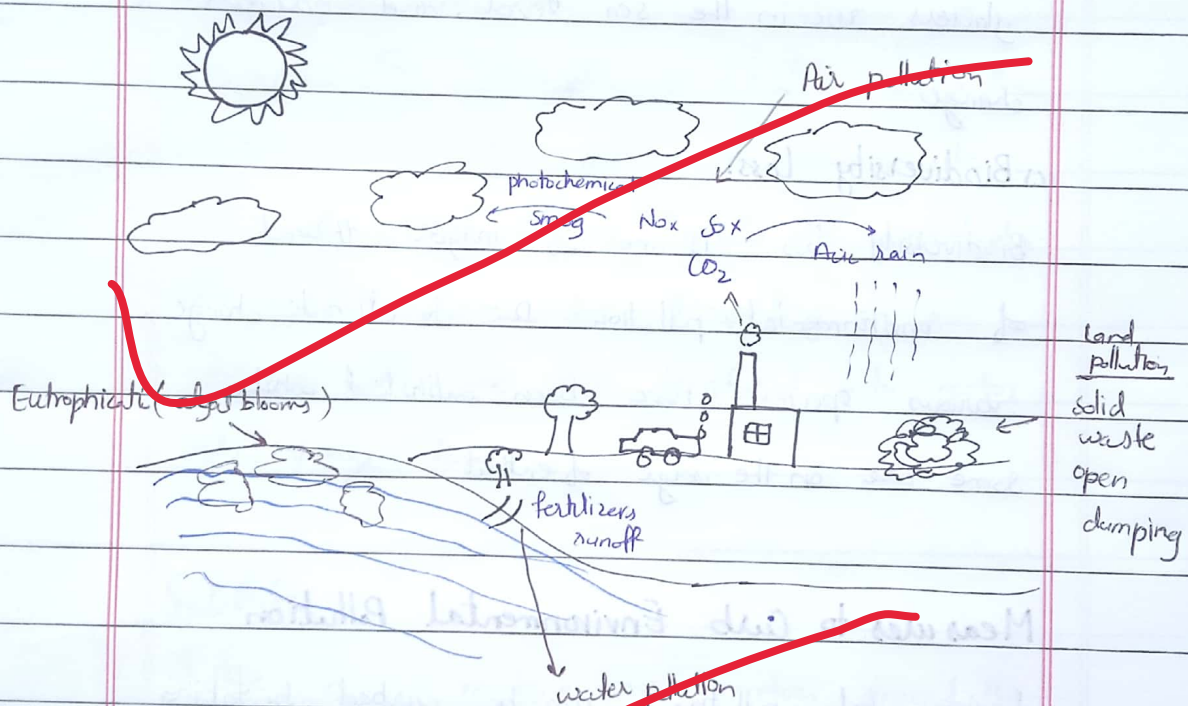
Example: Addition of CO_2 , SO_x , NO_x , Methane into the air.

(b) Water Pollution: Water pollution is the pollution of hydrosphere of earth in which water resources are polluted with harmful substances.

Example: Water polluted with fertilizers.

(c) Land Pollution: Land pollution is mainly the pollution in the form of solid waste on the surface of lithosphere.

Example: plastic pollution on Earth



Harmful Effects:

① Health Impacts:

Environmental pollution poses serious health impacts.

Air pollution such as smog have serious implications and cause lungs diseases. Similarly, by drinking contaminated water cause kidney malfunction. These are few examples of health threats of air environmental pollution.

(b) Environmental Impacts:

Environmental pollution badly affects the environmental health and equilibrium. Air pollutants such as CO_2 , methane, CFCs cause global warming, which results in ^{global} temperature increase, melting of glaciers, rise in the sea level, and climate change.

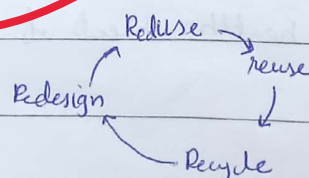
(c) Biodiversity Loss:

Biodiversity loss is one of major threat of environmental pollution. Due to climate change, various species have been extinct, while some are on the verge of extinct.

Measures to Curb Environmental Pollution

Environmental pollution can be curbed by taking some pragmatic measures such as:

- (i) Reducing the use of fossil fuels and transitioning to the renewable energy.
- (ii) Using efficient technologies to minimize the use of fertilizers and other harmful substances.
- (iii) Adopting the model of circular economy.



(iv)

Wireless Communication:

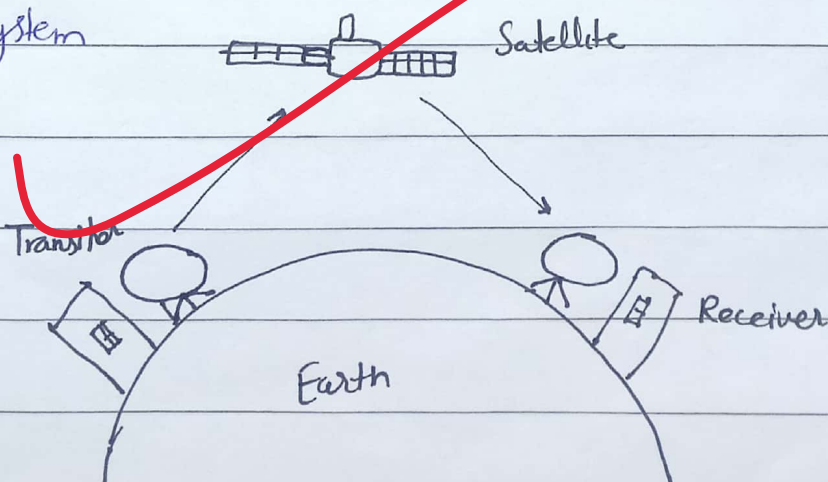
Wireless communication is a means of communication across large distances without any physical or wire connection via electromagnetic radiation.

Example: For example, a satellite uses the wireless communication system to communicate with its earth station. Signals are converted into electric form for transporting over a distance which are then deciphered into audio, video, image form.

Satellite

Satellite is a machine which revolves around the earth surface and is used to collection information either of space and celestial bodies or of earth.

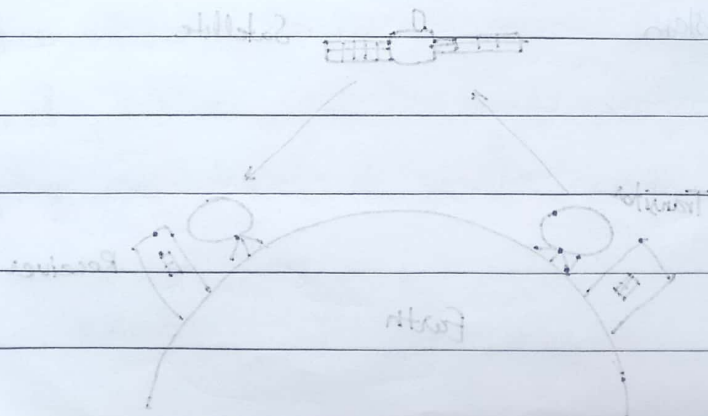
Satellite works the wireless communication system



Transmitter sends signals to satellite in the form of electromagnetic radiations. Satellite converts the signals into coded information. Satellite collects the required information and then convert into electric signals and transmit them a receiver on the earth known as earth station collects the data coming from the sun and decipher it.

Satellite uses solar energy in order to sustain it. For this purpose, satellites contain solar plates.

Example: Satellites are used to collect weather informations



Qno 5

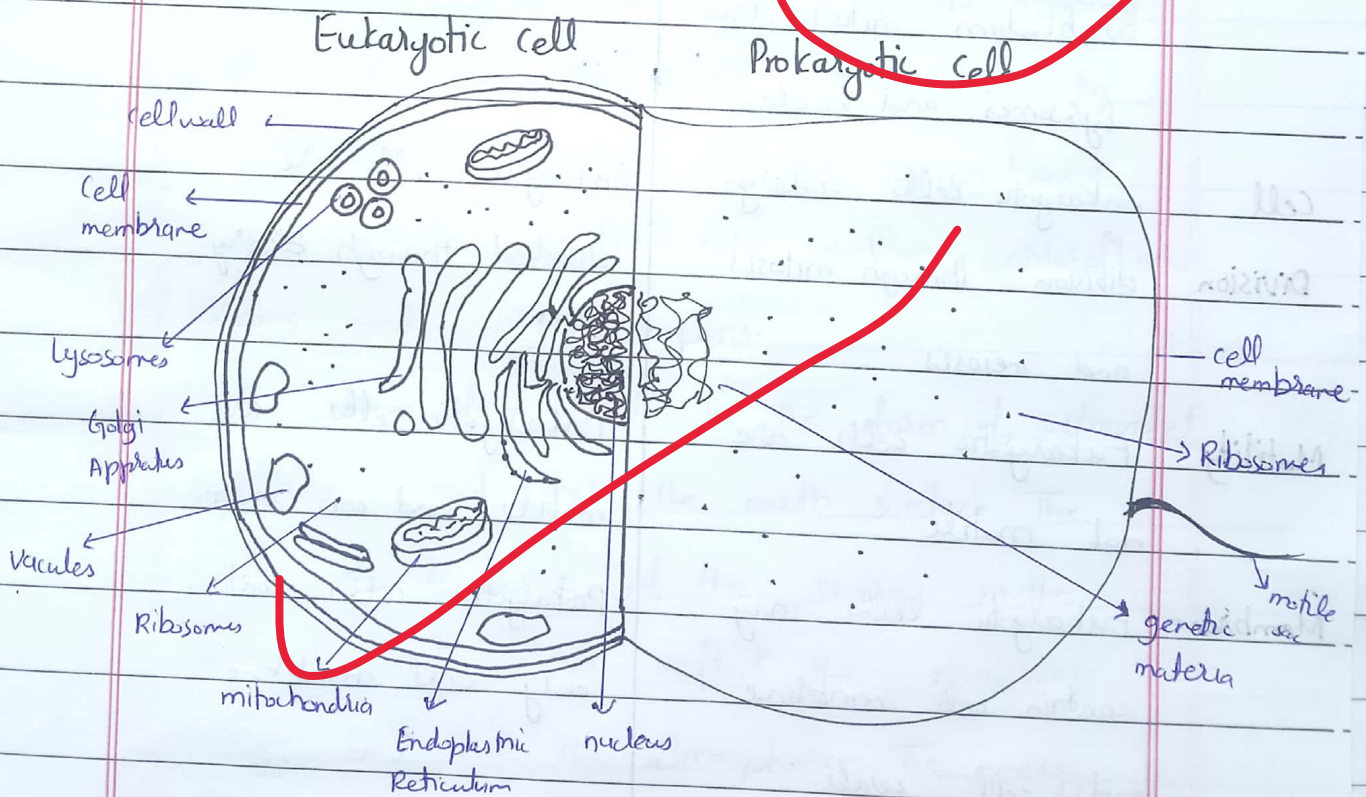
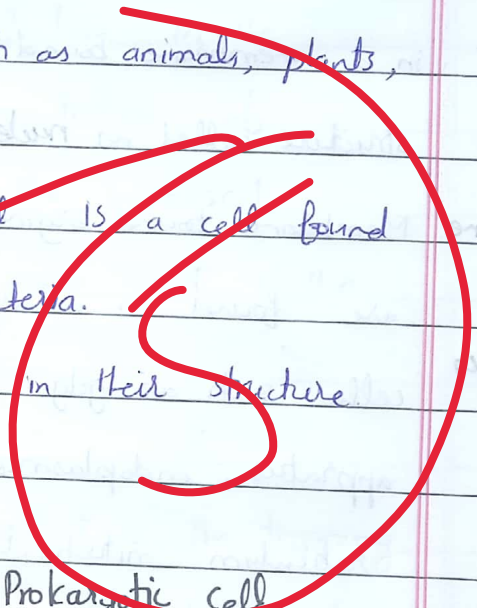
(i)

Difference between Eukaryotic and Prokaryotic cell.

Eukaryotic cell: Eukaryotic cell is a cell found in eukaryotic organisms such as animals, plants, fungi etc.

Prokaryotic cells: Prokaryotic cell is a cell found in prokaryotes such as bacteria.

Both have lots of differences in their structure.



	Eukaryotic Cell	Prokaryotic cell
Organism:	It is found in eukaryotes such as animals, plants and fungi.	It is found in prokaryotes such as bacteria.
Genetic Material	Genetic material is found in a membrane bound structure called as nucleus	Nucleus does not exist. Genetic material found in cytoplasm.
Membrane Bound organelles	Membrane bound organelles are found in eukaryotic cells such as golgi apparatus, endoplasmic reticulum, mitochondria, lysosomes, and vacuoles.	Membrane bound organelles do not exist in this type of cell.
Cell Division	eukaryotic cells undergo division through mitosis and meiosis	Prokaryotic cells are divided through binary fission
Motility	Eukaryotic cells are not motile	Prokaryotic cells are motile and can move.
Membrane	Eukaryotic cells may contain cell membrane and cell wall.	Prokaryotic cells contain only cell membrane.
Complexity	Eukaryotic cells are highly complex.	Prokaryotic cells are simple cells

(ii)

Global Warming

Global warming is a phenomenon which can be defined as increase in global temperature due to increased greenhouse gases concentration in the atmosphere. As the concentration of greenhouse gases is increased, the increased greenhouse effect traps more heat in the atmosphere.

Greenhouse Effect

Greenhouse effect is the trapping of heat into the earth atmosphere by the greenhouse gases in the air. Greenhouse gases include carbon dioxide, methane, chlorofluorocarbons and water vapors.

Light comes from heat in the form of ultraviolet radiations and hit the earth surface. The earth absorb some of the energy in the form of heat and reflect the remaining energy back into the atmosphere. The energy absorbed by the earth is re-radiated into the troposphere. This re-radiated energy is in the form of infra-red radiations (IR) which

can be absorbed by the greenhouse gases.

Greenhouse effect is a natural phenomenon

as if these gases do not absorb heat the temperature of Earth could drop to -15°C

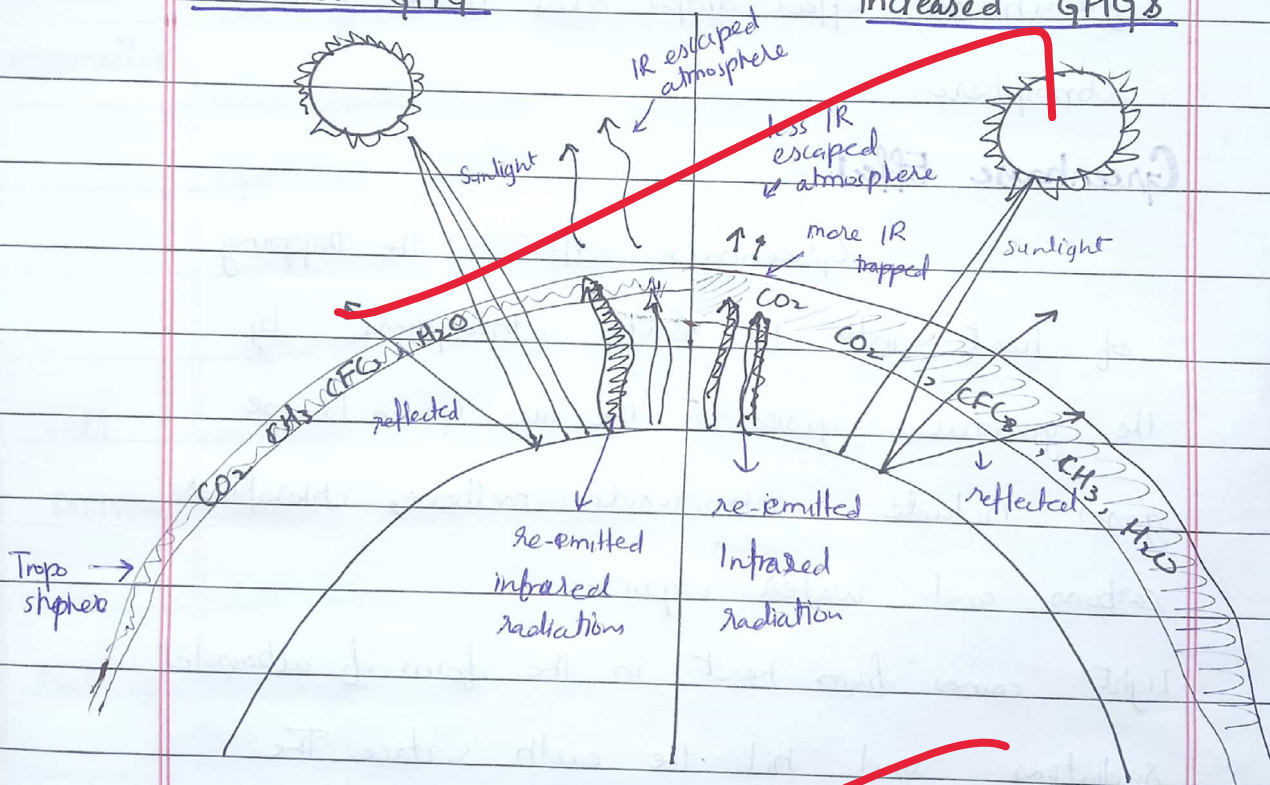
-15°C . However, ^{the} concentration of greenhouse gases has exponentially increased due to the man-made

anthropogenic activities. Resultantly, the earth

is facing a phenomenon of global warming.

Normal GHG

Increased GHG



Kyoto Protocol

Kyoto Protocol is an international environmental agreement aimed at reducing the greenhouse gases concentration emissions into the atmosphere thus controlling the global warming.

It was signed in Kyoto, Japan during the Conference of Parties of United Nations Framework Convention on Climate change.

Objective:

Its main goal was to reduce the greenhouse gases emissions especially CO_2 by reducing the fossil fuels usage in transport and industry.

Success or Failure:

Kyoto Protocol is considered as a failure because it failed to achieve the target goals despite making some progress.

(iii)

GIS

GIS stands for Global Information system.

It is a network of satellites and computers aimed at collecting, storing, interpreting, and creating data about geographical features of the earth.

Functions:

- ① Collection of geographical information
- ② Management of geographical data
- ③ Interpretation of geographical information
- ④ Storage of geographical data.

(iv)

Antioxidants:

Antioxidants are substances which are added in food to protect it from deterioration or degradation caused by oxidation.

Its name is evidence of its function. It prevents the oxidation of food products.

Explanation:

Oxidation is process in which food material undergoes the loss of or removal of electrons or addition of protons. As a result of oxidation, free radicals are produced which speed up the process of food degradation.

Example:

Acetic acid is one of the prominent example of antioxidants.

Q no 6

(c)

Given Data:

diameter of circle = 6 cm

To Find:

area of circle = $A = ?$ circumference of circle = $C = ?$

Solution

(i) Area of circle:

Applying the formula of Area

$$\text{Area} = A = \pi r^2$$

Diameter of area is 6 cm. By using the
the formula diameter, r (radius) can be find.

$$d = 2r$$

$$6 \text{ cm} = 2r$$

$$r = \frac{6 \text{ cm}}{2}$$

$$r = 3 \text{ cm}$$

Now using the value of radius r to find
area.

$$A = 3.14 \times (3)^2$$

$$A = 3.14 \times 9$$

$$A = 28.26 \text{ cm}$$

(iii) Circumference of circle

Using the formula of circumference

$$C = \pi d$$

$$C = 3.14 \times 6$$

$$C = 18.84 \text{ cm}$$

Answers:

$$C = 18.84 \text{ cm}$$

$$A = 28.26 \text{ cm}$$

(d)

Identify the missing

$$(i) \quad \begin{array}{ccccccc} & +11 & & +22 & & +44 & & +88 & & +176 \\ & \curvearrowright & & \curvearrowright & & \curvearrowright & & \curvearrowright & & \curvearrowright \\ (i) & 13, & 24, & 46, & 90, & 178, & \underline{354} \end{array}$$

This is an addition series.

$$(ii) \quad \begin{array}{ccccccc} & +1 & & +3 & & +5 & & +7 & & +11 \\ & \curvearrowright & & \curvearrowright & & \curvearrowright & & \curvearrowright & & \curvearrowright \\ (ii) & 5, & 6, & 9, & 14, & 21, & \underline{32} \end{array}$$

This is an addition series in which each term

is a comes after the addition of series of prime numbers.

Given Data

Slices in small pizza = 2

" " medium pizza = 3

" " large pizza = 4

Total number of slices = 9

weight
price of one slice = 40 grams

Price of small pizza = Rs. 320

To Find

Price of the total pizza = ?

weight of the total pizza = ?

Solution

① Weight of the total pizza

weight of one slice = 40 grams

weight of 9 slices = 9×40

= 360 grams

As total pizza consists of 9 slices, the

weight of total pizza is 360 grams

② Price of the Total Pizza:

Price of small pizza = Rs. 320

As small pizza has 2 slices, price of one

slice = $\frac{320}{2} = 160$

price of total pizza / 9 slices = 9×160

= Rs. 1440

(b)

To Find:

Present age of Aman = ?

Let suppose, the ^{present} age of Aman as x present age of Aman = x Aman's age before 10 years = $x - 10$ Aman's age after 20 years = $x + 20$

As Aman's age after 20 years would be

10 times the ^{10 years} his age ^{back}

$$x + 20 = 10(x - 10)$$

$$x + 20 = 10x - 100$$

$$x - 10x = -100 - 20$$

$$-9x = -120$$

$$x = \frac{120}{9}$$

$$x = 13.33$$

Aman's present age is approximately 13 years.

(c)

Given data:

Time taken by Peter to mow the lawn = 40 min.

" John " " = 60 min.

To Find:

Time taken to mow the lawn together = ?

Solution:

Using formula

$$\text{Time taken by Both together} = \frac{xy}{x+y}$$

Let suppose time taken by Peter as x and time taken by John as y . Putting values in the formula

$$\text{Time to mow lawn together taken} = \frac{40 \times 60}{40 + 60} = \frac{2400}{100} = 24 \text{ min}$$

24 mins will be taken by John and Peter mowing lawn together.

Given Data:

$$\text{original number} = \frac{5}{3}$$

$$\text{Wrong number} = \frac{3}{5}$$

To Find:

Percentage Error in calculation = ?

Solution:

Formula to find percentage error in calculation

$$\text{percentage error} = \frac{\text{original value} - \text{wrong value}}{\text{original value}} \times 100$$

putting the values in the formula:

$$\text{percentage error} = \left(\frac{5}{3} - \frac{3}{5} \right) \times 100$$

$$= \frac{\frac{5}{3}}{\frac{5}{3}} \times 100$$

$$= \left(\frac{25 - 9}{15} \right) \times 100$$

$$= \frac{16}{15} \times \frac{3}{5} \times 100$$

$$= \frac{48}{75} \times 100$$

$$= \frac{4800}{75}$$

$$= 64\%$$

Percentage error in calculation is 64%.

(a)

I.Q

Intelligence Quotient
Intelligence quotient is a measure of intellectual strength and stability of an individual.

E.Q

Emotional Quotient
Emotional quotient is the measure of emotional strength and stability of an individual.