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Section- II

QNo-7

(a). Calculate the Volume of a sphere with diameter 14 cm (use $\pi = \frac{22}{7}$)

Solution

We know That

Volume of sphere $= \frac{4}{3}\pi r^3$:

Give that

Diameter $= D = 14\text{cm}$

Radius $= r = \frac{D}{2}$

$= \frac{14\text{ cm}}{2} = 7\text{cm}$

By using formula and putting values we have

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

$$= \frac{4}{3}\left(\frac{22}{\cancel{7}}\right)(\cancel{7})^3\ \text{cm}^3$$

$$= \frac{4}{3}(22)(7)^2\ \text{cm}^3$$

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Also

$$V = \frac{4}{3}(22)(49)\ cm^3$$

$$= 4 \times 7.33 \times 49\ cm^3$$

$$= 29.32 \times 49\ cm^3$$

$$= 1396.68\ cm^3$$

Volume = 1396.68 cm^3

Q No-7

(b) Five friends total saving = 25,000 Rs, ratio 1:2:3:4:5

Find the Smallest share

Solution

Given data is

Friends = 5

Saving amount = 25,000

ratio = 1:2:3:4:5

Sum of ratio = 1+2+3+4+5

= 15

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Smallest Share = $\frac{1}{\text{Sum of ratio}} \times 25000$

$= \frac{1}{15} \times 25000^{5000}$

$= \frac{5000}{3}$

$= 1666.666$

$= 1666.67$

Smallest share ≈ 1666.67

Q No-7

(C) complete the series

i- 2, 6, 18, 54, 162, 486

which number does not fit.

ii- 3, 5, 7, 11, 13, ____

which number comes next.

Solution

Given that

i- 2, ~~8~~, 6, 18, 54, 162, 486

= 2, 6, 18, 54, 162, 486

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$2 \times 1 = 2$

$\Rightarrow 2 \times 3 = 6$

$6 \times 3 = 18$

$18 \times 3 = 54$

$54 \times 3 = 162$

$162 \times 3 = 486$

Here all the six numbers are even, but except "2" all the numbers are divisible by number 3. So "2" does not fit in it.

ii-

3, 5, 7, 11, 13, 17

The prime numbers are represented by P and are

P = 2, 3, 5, 7, 11, 13, 17, ...

are those numbers which are divisible by "1" and itself so next number in series is 17.

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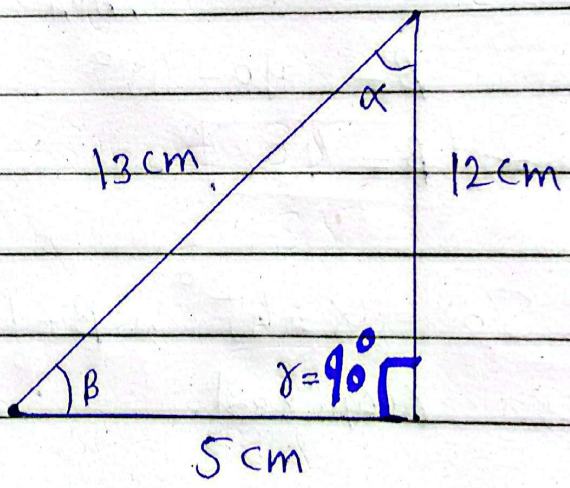
Q No-7

(d) A triangle with sides 5 cm, 12 cm, 13 cm. Find all three angles

Solution

Consider a triangle with sides 5 cm, 12 cm, 13 cm.

Let triangle be



By Pythagoras Theorem

$$c^2 = a^2 + b^2$$

$$\Rightarrow (13)^2 = (5)^2 + (12)^2$$

$$\Rightarrow 169 = 25 + 144$$

$$\Rightarrow 169 = 169$$

It is clear that it is right angle triangle So

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So its one angle is 90°.
we also know all
the three sum of
angles of triangle

$$\alpha + \beta + \gamma = 180^\circ$$

So let $\gamma = 90^\circ$

$$\Rightarrow \alpha + \beta + 90 = 180^\circ$$

$$\Rightarrow \alpha + \beta = 180^\circ - 90^\circ$$

$$\Rightarrow \alpha + \beta = 90^\circ$$

Here $\boxed{\alpha = 45^\circ}$ Then

$$\beta = 90 - 45^\circ$$

$$\Rightarrow \boxed{\beta = 45^\circ}$$

$\Rightarrow$ So $\alpha = 45^\circ$, $\beta = 45^\circ$, $\gamma = 90^\circ$ as required.

Q No-6

(a) A store has packets of candies in flavors, Apple, Berry, Cherry and Date in ratio 3:6:2:5 if the apple candies exceed Date candies by 35, how

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many berry candies are there

Solution Given that

Apple Candies $= 3x$
Berry Candies $= 6x$
Cherry Candies $= 2x$
Date Candies $= 5x$

By the given condition

$$5x - 3x = 35$$
$$\Rightarrow 2x = 35$$
$$\Rightarrow x = \frac{35}{2}$$
$$\Rightarrow \boxed{x = 17.5}$$

How many Berry Candies = ?

Berry Candies $= 6x$
$= 6(17.5)$
$= 105.0$

Berry Candies = 105

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Q No-6

(b) A Camera priced at 200 $ gets 25% off plus 6% tax. Calculate total amount paid.

Solution Given data

Camera price = 200 $

% off = 25

% tax off = 6

By the given condition

$$25\% \text{ off} = 200 \times \frac{25}{100}$$

$$25\% \text{ off} = 50\ \$$$

$$6\% \text{ tax off} = \frac{200}{100} \times 6$$

$$= 12\ \$$$

Total discount = 50 $ + 6x2 $

= 50 $ + 12 $

= 72 $

Paid amount = 200 − 72

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Paid amount = 200 − 72

= 128 $

So 128 $ are to be paid by the customer.

QNo-6

(c) A bicycle covers 36 km at 18 km/hr starting at 1 pm. What time does he it reach

Solution

Total distance = S = 36 km

Speed = V = 18 km/hr

Time = ?

We know that

$S = Vt$

$\Rightarrow t = \frac{S}{V}$

$= \frac{36\ km}{18\ (km/hr)}$

$\boxed{t = 2\ hr}$

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Time at starting = 1 PM
Finished Time when its bicycle reached destination = 3PM

QNo-6

(d) Unscrambled these math terms

i- STSTAICITS
ii- LGEBMAR

Solution

i- STSTAICITS
Possible Word by This

= STATISTICS

ii- LGEBMAR
Possible Words are

a = GAMBLER
b = BLAMER

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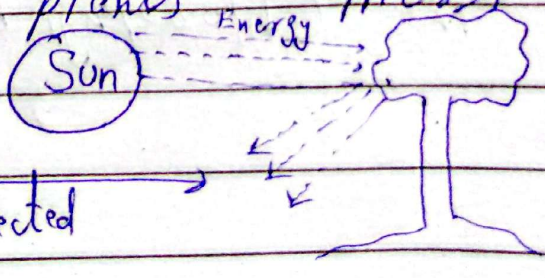
Section - I

Q No-4

(a) Write a note on plant kingdom "chlorophyll"

Solution

chlorophyll It is a green pigment that allows plant to peoform photosynthesis. It is a process in which light energy is converted into chemical energy. This pigment is found in chloroplast. The light from Sun particularly of red and blue wavelength, while it reflects green light, thats why plants appear green.



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Role of chlorophyll

i- photosynthesis

Chlorophyll is a primary pigment responsible for capturing light energy, which is used to convert Carbon dioxide and Water into glucose (food) and oxygen

CO_2 + water ⟶ food + O

ii- Electron donor:

It acts as the primary electron donor in the process

Types of chlorophyll.

i- Chlorophyl a.

ii- Chlorophyl b.

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Q No-4

(b)- Describe role of ribosomes in protein synthesis.

Solution

Ribosomes are the cellular machinery responsible for protein synthesis, reading messenger (mRNA) to assemble amino acids into a polypeptide chain. These are used to transfer RNA to bring the correct amino acids in a sequence.

Role in protein Synthesis

a- Read genetic instructions

Ribosomes are bond to an MRNA molecule and move along its sequence

b- Catalyzing peptide bond formation

The ribosomes catalyzes the formation of peptide

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bond between amino acids and growing polypeptide chain.

c- protein assembly.

The completed polypeptide chain is then released from the ribosome and then fold into three functional sets.

Q No-4

(c) Discuss the Different methods of Solid Waste management.

Solution

There are several methods to get rid from solid waste management like landfilling, incineration, recycling composition, and waste to energy processes. We are going to discuss them one by one.

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Landfilling

It is a process by which waste is managed by burying it for-flung areas. But, the transportation cost and other management issues are still there to add fuel to the fire.

Incineration

Burning of waste decreases its mass and volume. But, again it is counter productive for the environment.

Recycling

Recycling is a process by using waste products can be recycled, by and large this is also an expensive process to manage the waste.

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Composition

It is a biological technique to decompose the organic materials to reduce the waste.

Waste to Energy process

It is a process by which waste is transferred as an energy for the development of economy. It is also an expensive phenomenon to generate energy from waste.

Best method for Waste Management

The very best method for waste management is to **Educate People**. Educated community cannot spread waste and trash to harm its environment and also the country.

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Q No-4
(D) Definitions

i- Biofuel

Biofuel is any fuel derived from biomass such as plant or animal waste, and is considered a renewable energy source as it can be replenished.

examples: bioethanol and biodiesel

ii- Adulteration

It is the act of contaminating or degrading a product, most commonly food by adding cheaper, or harmful substances to increase its quantity or alter its appearance.

Examples: water to milk, brick dust etc

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iii- Hydrosphere

The hydrosphere is the total collection of water on a planet found on, under, and above the surface in all its forms : liquid, ice and vapor.

iv- Troposphere

Troposphere is the lowest layer of Earth's atmosphere, starting at the surface and extending upward to the stratosphere. where all weather and 99% of atmospheric water vapor occur.

v- Isotopes

Isotopes are atoms of the same chemical element that have the same number of protons but different numbers of neutrons.

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Q No-5

(a)- Pakistan is the fifth most populous country of the world. What are the causes of population explosion in pakistan? What can be the control measures.

Solution It is true that Pakistan is the 5th largest population of the world. According to census 2023, the population is 241.5 million. There are several causes of population explosion.

Causes

i- High Birth Rate

Major driver of the population expansion is the high birth rate.

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ii- Low literacy rate

The literacy rate in Pakistan of males is 68% and of females is 52%. The illiteracy is the main reason of the population explosion.

iii - Early marriages

The very root of illiteracy chain is the early marriages in tribal areas of KPK. Colonial mindset and authoritarian attitude in rural areas is driving force of early marriages which ultimate result of increase in population

iv- Poverty

Poverty can create a cycle where large families are seen a source of labour or old-age security.

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v- Religious misconception.

A desire for large family, especially for sons, and certain interpretations of religious teachings are causing high birth rate.

control measures

i- Expand family planning
ii- Improve female education and literacy rate
iii- Enhance Health Care System
iv- Implement public awareness by stopping child marriages.

v- Addressing Socio economic issues.

Q No-5

(b)- what is remote Sensing? Discuss role of GIS in environmental Science.

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Solution

Remote Sensing. Remote Sensing is a science of acquiring information about an object or phenomenon from a distance, without making physical contact.

Its working.

It consists of **sensors** and are fixed on the satellite, aircraft or drones.

Energy collection. It collects energy from sensors that is reflected or emitted by the targets.

Data processing.

The collected energy data is processed and analyzed to create images and other

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information about the object or area being studied.

Its applications

i- Environmental monitoring
ii- Global and natural resources
iii- Disaster management

Q No - 5

(c) The atmosphere is blanket of Earth "Justify with your answer"

Solution

It is true that atmosphere is a blanket of earth. It occupies the planet (earth), seasons clouds and all the living and non-living things. The living organisms with the help of ozon living organism imbalancing

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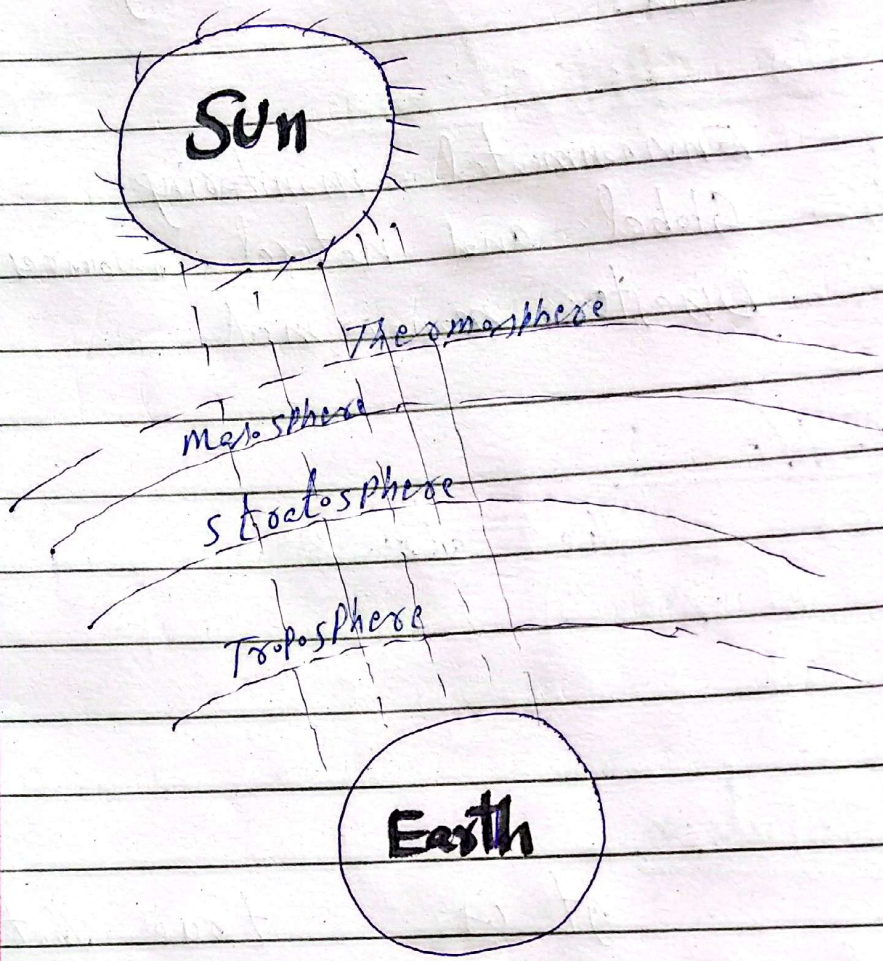
The environment.



The whole atmosphere is consisting of all the above mentioned objects including the different layers. Most of the times the human beings are considered the more destructive for this blanket.

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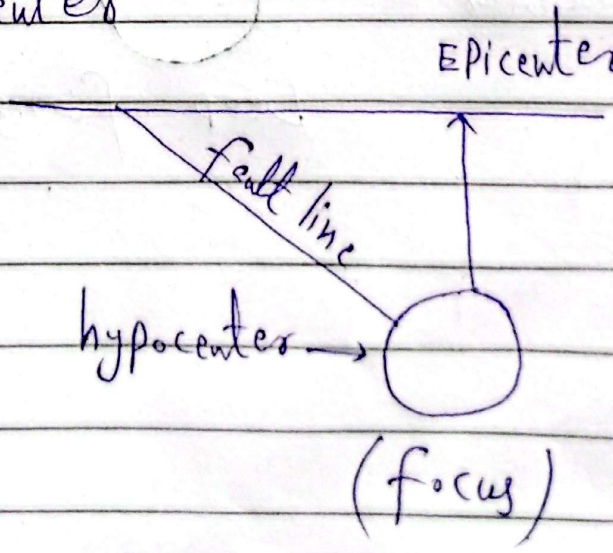
Q No-5 Definitions

i-Hydrometer It is an instrument used to measure the density of a liquid. It also can determine the gravity of a liquid.

ii. Epicenter The location below the earth's surface where earthquake starts is called hypocenter and the location directly above it on the surface of earth is called epicenter



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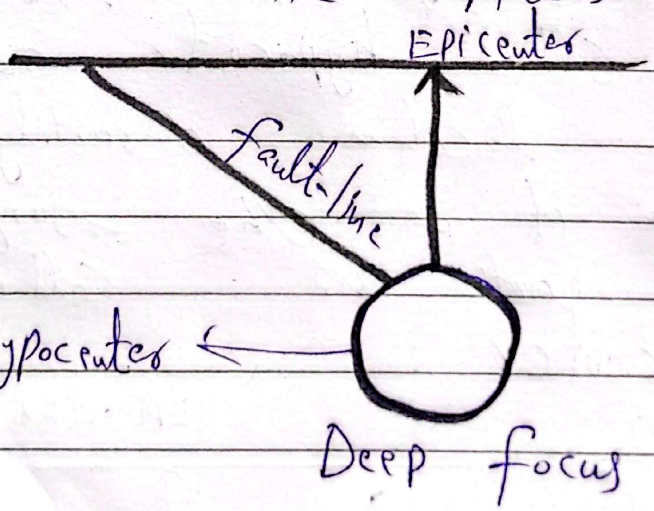
iii- Eye Wall of cyclone

It is the most dangerous and destructive part, surrounding the calm "eye" with the storm's strengths.

iv- Deep focus

It is a seismic event with a focal depth greater than **70 km** occuring with in tectonic plates.



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v-Light year.

A light year is the distance of light travel in one earth year.

one light year = 9 trillion km.

$= 9 \times 10^{12}$ km.