

Hi there - you've prepared well! Remember, knowing the content is one thing, but presenting it in the paper exactly as required is another. Here are a few key points to keep in mind:

1. For a 5-mark part, aim to write at least 2 and at most 3 sides of the answer sheet. Often, a question has two or three parts, and the marks are divided accordingly - so address each part fairly.
2. Manage your time wisely - you have about 35 minutes per full question, which comes down to around 8 minutes for each 5-mark part. Stick to this to avoid rushing later.
3. Make your answers look scientific, not just theoretical. Use flowcharts and diagrams wherever they add clarity.
4. Neatness matters - keep your handwriting clean, avoid cutting or overwriting.
5. Mind your spelling and grammar - while GSA doesn't deduct marks for these, your expression leaves an impression.
6. In the ability portion, explain analytical ability questions in words. For a 5-mark part, show all steps and provide clear explanations.

Here's a brief key/summary of your ability questions

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Q.6

a) Candy ratio problem
Given: Packets of candies: Apple - Cherry - Date = 3 : 6 : 2 : 5.

Asked: If Apple candies exceed Date candies by 35, how many Berry candies are there?

Note (consistency check): The ratio shows Apple = 3 parts and Date = 2 parts, so Date is larger than Apple in the ratio. The statement "Apple candies exceed Date candies by 35" contradicts the ratio (Apple cannot exceed Date if ratio is 3:2). This needs to be the

Why cells form organelles? Dismiss mitochondria in

1. If the problem truly stated Apple - Date = 35, that's impossible with the given ratio (would require negative common factor).

a human cell.

2. Most likely the intended meaning is Date exceeds Apple by 35 (i.e. Date - Apple = 35). I will solve that reasonable interpretation.

Formula: Let common factor = k. Apple = 3k, Date = 5k.

So $5k - 3k = 35 \Rightarrow 2k = 35$

Solution: $2k = 35 \Rightarrow k = 35 \div 2 = 17.5$
Berry = $6k = 6 \times 17.5 = 105$

Answer: 105 Berry candies.
(If you intended the other wording exactly as written, note that it is inconsistent with the ratio.)

b) Camera discount & tax

Given: Original price = \$200. Discount = 25% off. After discount, 6% tax applied.

Asked: Total amount paid

Formula / Steps:

Discount amount = $200 \times 0.25 = 50$

Sale price = $200 - 50 = 150$

Tax = 6% of sale price.

Total = sale price + tax

Solution (digit by digit):

Discount = $200 \times 0.25 = 50$

Sale price = $200 - 50 = 150$

Tax = $150 \times 0.06 = 9$

Total paid = $150 + 9 = 159$

Answer: \$159.00

c) Bicycle travel time

Given: Distance = 18 km, start time = 1:00 PM

Asked: Arrival time

Formula: Time = Distance / Speed

Solution: Time = $36 \div 18 = 2$ hours
Start = 1:00 PM, Cycle = 3:00 PM

Answer: 3:00 PM

d) Unscramble math terms

i. STATISTICS

ii. GAMBLER

Q7.

Given:

- Diameter (d) = 14 cm

- Radius (r) = $d/2 = 14/2 = 7$ cm

- $\pi = 22/7$

Asked: volume of sphere

Formula:

Volume = $(4/3)\pi r^3$

Now, let's plug in the values:

Volume = $(4/3) \times (22/7) \times 7^3$

= $(4/3) \times 22 \times 7 \times 7$

= 1437.33 cm^3

Answer:

The volume of the sphere is approximately 1437.33 cm^3

(b) Five friends' savings (total Rs. 25,000; ratio 1:2:3:4:5)

Given: Total = Rs. 25,000. Ratio = 1 : 2 : 3 : 4 : 5.

Asked: Smallest share (the "1" part).

Formula: Sum of ratio parts = $1+2+3+4+5 = 15$. Smallest = $(1/15) \times \text{total}$

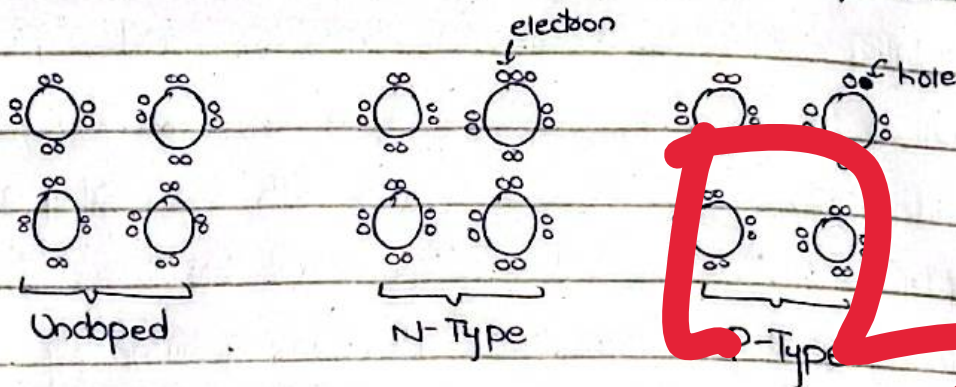
(b)

What is doping? Discuss different types of semiconductors.

"Doping is the process of adding impurities into the pure semiconductor to change its electrical properties."

Purpose:

The purpose of doping is to enhance conductivity, electrical, structural, and optical properties of semiconductors.



Common Dopants: Phosphorus, arsenic, Boron, Gallium

N-Type Semiconductor

* N-Type semiconductors formed by adding more electrons (e.g. phosphorus in silicon) producing extra electrons as majority carriers.

For example: Phosphorus

P-Type Semiconductor

P-Type semiconductors formed by adding fewer valence electrons resulting in holes as majority carriers.

For example: Boron in silicon

(c)

Volcanic Eruption Merits | Volcanic Eruption demerits

* Volcanic ash is rich of highly fertile minerals

Eruption of volcano causes destruction and

for agriculture purposes

* Geothermal Energy

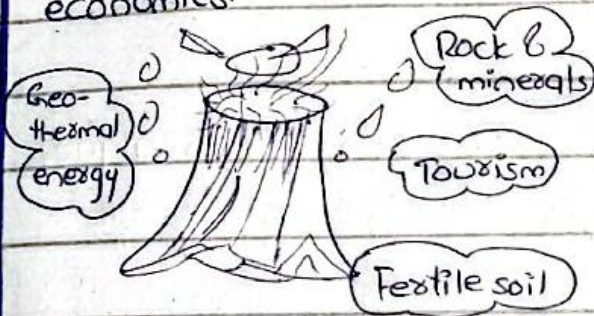
For power generation, volcanic regions can be utilized to produce geothermal energy.

* New landmass formation

New landmass and Islands are formed when lava solidifies on earth's surface.

* Tourism Boosting

Volcanic eruption attract tourism, boosting local economies.



loss of property

Air Pollution

Volcanic eruption causes air pollution that is harmful for human health and biodiversity.

Climate disruption

Climate disruption occurs as volcanic gases (like SO_2) block sunlight.

Natural Disasters

Eruption triggers earthquakes, Tsunamis, and landslides - worsening disasters.

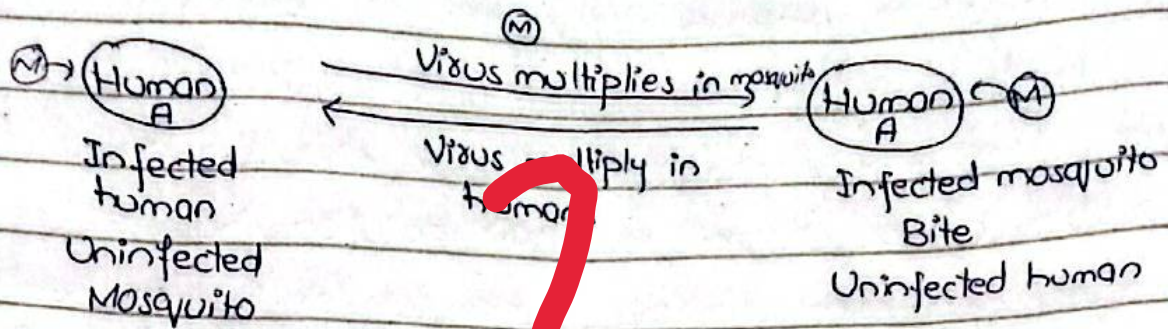


(d)

What is Dengue?

Dengue is a mosquito-borne viral disease that spread mainly through the bite of *Aedes Aegypti* mosquito.

It is caused by the Dengue virus (DEN), belonging to the Flavivirus genus.



Symptomology:

High fever, severe headache, joint and muscle pain, rash, and nausea.

Remedies:

Supportive care includes hydration, rest, using mosquito nets, and community awareness (prevention).

Q No 3:

(a)

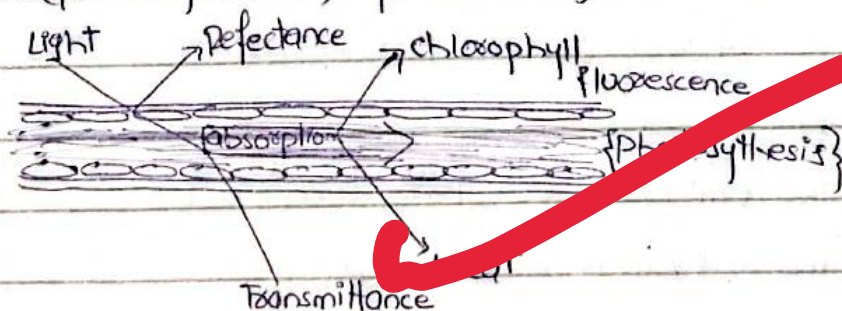
Chlorophyll

Chlorophyll is the green pigment found in plants, algae, and some bacteria. It is present in chloroplast of plant cells where it performs photosynthesis.

Function:

Absorb sunlight → Chemical energy

This process (photosynthesis) produces glucose and oxygen.



There are several types of chlorophyll.

a, b, c

Chlorophyll a is the most essential type.

Without chlorophyll, entire food chain would collapse.

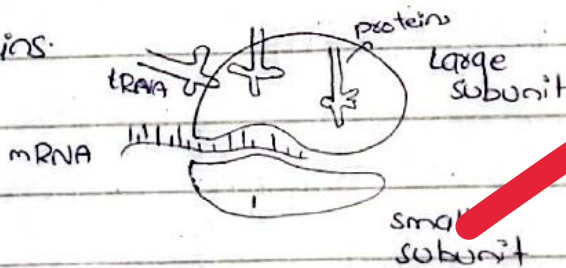
(b)

Role of Ribosomes in Protein Synthesis

Ribosomes are cellular organelles composed of RNA and proteins. They are often called as protein factories of cell as they serve as the site of protein synthesis.

How protein is synthesized?

During translation, ribosomes read mRNA code and link amino acids together using tRNA forming a polypeptide chain. These chains fold into functional proteins.



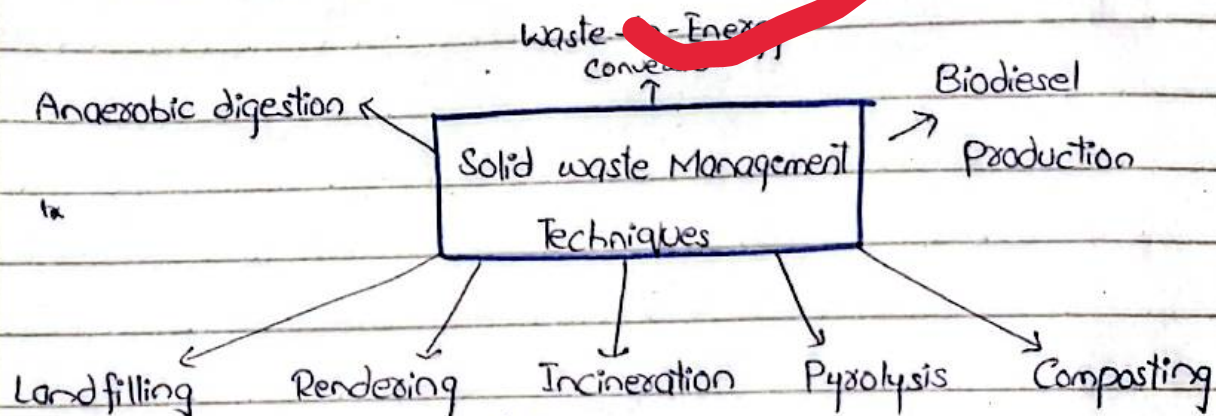
(Ribosomes)

(c) ^{waste} Methods of Solid Waste Management

Solid Waste Management refers to the collection, treatment, and disposal of solid materials. The major methods include:

1. Land filling - Disposing of waste in designated land

- areas, later cover with soil.
2. Incineration- Burning waste at high temperature to reduce volume and produce energy.
 3. Recycling- Reusing materials like glass, paper, and plastic to conserve resources.
 4. Composting- Decomposing organic waste into nutrient-rich manure.
 5. Pyrolysis- Thermal decomposition of organic material in the absence of oxygen.
 6. Rendering- Thermal process that converts animal by-products into usable materials.
 7. Anaerobic digestion- Chemical process in which microorganisms break down organic matter in the absence of oxygen, which results in CO_2 and CH_4 .



(d)

i) Biofuel

A renewable energy source made from biological materials like ~~cereals~~ crops, algae, or animal waste.

Example. Ethanol, biodiesel

(ii) Adulteration:

The mixing of impure / inferior or harmful substances in food or medicine to reduce cost and increase profit is known as adulteration.

(iii) Hydrosphere

The total amount of water on Earth is called as Hydrosphere that includes oceans, seas, rivers, lakes, underground water, and ice-caps.

(iv) Troposphere

The lowest layer of atmosphere, where weather changes occur and life exists; it extends upto about 12km.

(v) Isotopes

Atoms of the same element having the same number of protons but different number of neutrons.

Example: C-12, C-14

Q No 4: Section II

(4)

Data: Apple = 3

Berry = 6

Cherry = 2

Date = 5

Find: Find Berries, if Apple exceeds Date candies by 35.

Solution:

Let's suppose: Berry = $6x$, Apple = $3x$, Date = $5x$

Date exceeds Apple by 35:- Date - Apple = 35

$$5x - 3x = 35$$

$$2x = 35$$

$$\text{value of } x = 17.5$$

$$\text{Berrys} = 6x = 6 \times 17.5 = 105 \text{ Berry candies}$$

(b)

Data: Price of camera = \$200

Discount = 25% Tax = 6%

Find: Total amount paid = ?

Solution: Price after discount = $200(1 - 25\%)$

$$= 200(1 - 0.25) = 0.75 \times 200$$

$$= \$150$$

$$\text{Add 6\% Tax} = 150 \times (1 + 0.06) = \$159$$

(c)

Data: Distance = 36 km, Speed = 18 km/h, Start at 1pm

Find: Time = ?

Solution: Time = $\frac{\text{distance}}{\text{speed}}$

$$= \frac{36 \text{ km}}{18 \text{ km/h}} = 2 \text{ hours}$$

Start 1:00 pm, arrives 3:00 pm

(d)

(i) STATISTICS

(ii) ALGEBRA

Q No 4:

(a)

Data: Diameter = 14cm $\pi = \frac{22}{7}$

Find: Volume of a sphere = ?

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

$$V = \frac{4}{3} \times \frac{22}{7} \times (7)^3 = \frac{4}{3} \times \frac{22}{7} \times 343 = \frac{4}{3} \times \frac{22}{7} \times 343$$

$$V = \frac{4}{3} \times 22 \times 49 = \frac{4312}{3} \text{ cm}^3 = 1437.33 \text{ cm}^3$$

(b)

Total savings = Rs. 25000

$$\text{ratio} = 1:2:3:4:5 = 1+2+3+4+5 = 15$$

Find smallest one = ?

$$\text{Smallest} = \frac{1}{15} \times 25000 = 1666.67 \text{ (approx)}$$

(c)

(i) 2, 6, 18, 54, 162, 486

$$\begin{array}{ccccccc} 2 & , & 6 & , & 18 & , & 54 & , & 162 & , & 486 & , & 1458 \\ \underbrace{\quad \quad} & \underbrace{\quad \quad} & \underbrace{\quad \quad} & \underbrace{\quad \quad} & \underbrace{\quad \quad} & \underbrace{\quad \quad} & \underbrace{\quad \quad} & \underbrace{\quad \quad} & \underbrace{\quad \quad} & \underbrace{\quad \quad} & \underbrace{\quad \quad} & \underbrace{\quad \quad} \\ x3 & x3 & x3 & x3 & x3 & x3 & x3 & x3 & x3 & x3 & x3 & x3 \end{array}$$

(ii) 3, 5, 7, 11, 13

3, 5, 7, 11, 13, 17

sequence of prime numbers.

(d)

Triangle with sides 5, 12, 13

Find ~~right~~ angles (all three)

(1) Check right angle:

$$(5)^2 + (12)^2 = 25 + 144 = 169 = (13)^2$$

$$\text{Angle } C = 90^\circ$$

$$(2) \sin A = \frac{5}{13} = \sin^{-1} \frac{5}{13} = 22.6^\circ$$

$$\text{Angle } A = 22.6^\circ$$

$$(3) B = 90^\circ - 22.6^\circ = 67.4^\circ$$

$$\text{Angle } B = 67.4^\circ$$