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SECTION - II

⇐ (Q#6) ⇒

(a) Solution :-

Given : Store has packets of candies in flavours
Apple, Berry, Cherry & Date,
(Let A, B, C & D)
in the ratio 3 : 6 : 2 : 5.

$$A : B : C : D = 3 : 6 : 2 : 5 \quad \text{--- ①}$$

Suppose, $A = 3x$, $B = 6x$, $C = 2x$
and $D = 5x$.

According to the given condition :

$$\text{Apple} = \text{Date} - 35$$

$$\Rightarrow 3x = 5x - 35$$

Solving for x , we have

$$5x - 3x = +35$$

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

Now, Berry candies are given by :

$$B = 6x = 6 \times 17.5 \Rightarrow \boxed{B = 105}$$

Thus, there are 105 Berry candies.

(b) Solution :-

Given : Price of camera = 200 \$

After getting 25% off :

$$\frac{25}{100} \times 200 = 50 \$$$

$$\text{Tax} = 6\% \rightarrow \frac{6}{100} \times 200 = 12 \$$$

$$\begin{aligned}\text{Total Amount Paid} &= \text{Discounted Price} + \text{Tax} \\ &= 50 \$ + 12 \$ \\ &= 62 \$\end{aligned}$$

Thus, total amount paid for camera is 62 \$.

(c) Solution :-

Given : Distance = 36 km

Speed = 18 km/hr

Time = ?

As we know that $\text{Speed} = \frac{\text{Distance}}{\text{Time}}$

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

Substituting the values, we get :

$$\Rightarrow \text{Time} = \frac{36}{18} = 2 \text{ hr}$$

So, if the bicycle starts at 1 pm, after 2 hr it will reach at 3 pm.

(d) Solution :-

i. STSTALCPTS

STATISTICS

ii. LGEBMAR

GAMBLER

In Math term

it has to be ALGEBRA

but 'A' is missing

Q.#7

(a) Solution :-

Given : Diameter of sphere = 14 cm

$$r = \frac{d}{2} = \frac{14}{2} = 7 \text{ cm.}$$

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

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

$$= \frac{4312}{3} \approx 1437.33 \text{ cm}^3$$

Thus, volume of sphere is 1437.33 cm^3 .

(b) Solution :-

Given : Total savings = Rs. 25,000.

Ratio of friends = 1:2:3:4:5

As, smallest share has ratio 1, so:

Let $A:B:C:D:E = 1:2:3:4:5$

$$\text{Share of A} = \frac{1}{\text{sum of ratios}} \times \text{total savings}$$

sum of ratios

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

$$= \frac{5000}{3} \approx 1666.67$$

Thus, the smallest share is Rs. 1666.67.

(c) Solution :-

i. 2, 6, 18, 54, 162, 486 (All fit as #)

ii. 3, 5, 7, 11, 13, 17 (prime numbers)

$$2 \times 3 = 6$$

$$6 \times 3 = 18$$

$$18 \times 3 = 54$$

$$54 \times 3 = 162$$

$$162 \times 3 = 486$$

Geometric sequence.

(d) Solution :-

Given: Sides of triangle = 5 cm, 12 cm, 13 cm

Let's check if these satisfy the Pythagoras Theorem:

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

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

$$25 + 144 = 169$$

$$169 = 169 \rightarrow \text{Satisfied}$$

Thus, the triangle is a right-triangle.

So, 1st angle = 90°

Remaining angles:

Sum of angles = 180°

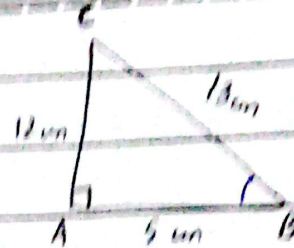
$$90^\circ + \angle B + \angle C = 180^\circ$$

$$\angle B + \angle C = 90^\circ$$

$$\Rightarrow \angle B = \sin \theta = \frac{P}{H} = \frac{12}{13}$$

$$\text{Other angles} = 45 + 45 = 90^\circ$$

Thus, the three angles are $90^\circ, 45^\circ, 45^\circ$.

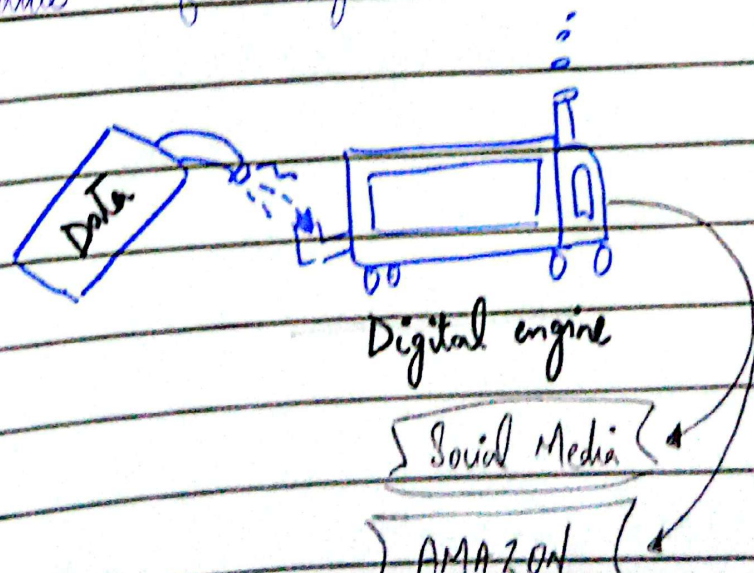


SECTION - I

⇐ (Q#2) ⇒

(a) "Data is the new oil": Yes, I agree with it.

Just like oil powered the industrial age, data powers the digital age. It is valuable, but only when refined and analyzed to produce useful insights.



Here are the three everyday examples:

① Online Shopping :-

Websites like Amazon use data about your searches and past purchases to recommend products that you are more likely to buy.

② Social Media :-

Apps like Instagram or TikTok collect data on what you watch and like, then use it to show you more similar content.



Instagram



TikTok

③ Navigation Apps :-

Google Maps use live data from users' phones to show traffic conditions and suggest the fastest route.

In conclusion, data helps companies, apps, and services to make smarter decisions — just as oil once fueled machines, data now fuels technology.

(b) Universe is Expanding :-

The expanding universe is often compared to a balloon being blown up, because both show how space itself stretches — not that objects move through space, but that space between them increases.

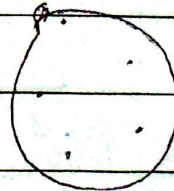
Resemblance :-

① Surface of the balloon = Space

Imagine dots drawn on the surface of a balloon — they represent galaxies. When you blow air into the balloon, the surface expands, and the dots move away from each other, even though they are not moving on their own.



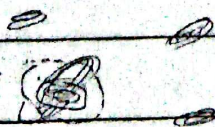
Original balloon



when blown

② Air filling = Expansion of space

As the balloon fills with air, the space (rubber) between the dots stretches. Similarly, in the universe, space itself expands, carrying galaxies further apart.



Milky Way Galaxy

Many other galaxies
(after expansion)

(3) No center of expansion

On the balloon's surface, every point sees all other points moving away. Likewise, in the universe, every galaxy sees others moving away, meaning expansion happens everywhere, not from a single center.

In conclusion, the universe expands like a balloon inflating — distance grows because space stretches, not because galaxies are flying through empty space.

(1) Balanced Diet :-

A balanced diet means eating the right amount of different foods so that the body gets all the essential nutrients — carbohydrates, proteins, fats, vitamins, minerals, fiber, and water — in proper proportions to stay healthy and energetic.

Quantitative formula :

Carbohydrates = 45-65%

Proteins = 10 - 35%

Fats = 20 - 35%

Deficiency Effects :-

Vitamin A Deficiency

- Causes night blindness (difficulty seeing in dim light)
- Can also lead to dry and rough skin

Vitamin D Deficiency

- Leads to rickets in children (soft and weak bones)
- Causes osteomalacia in adults (bone pain and weakness)

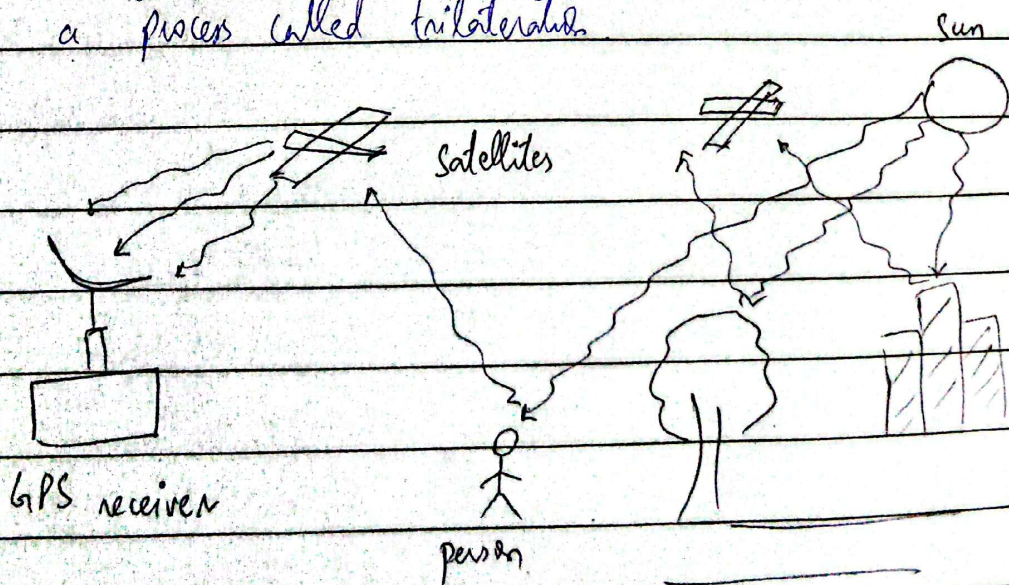
Vitamin E Deficiency

- May cause muscle weakness and nerve problems
- Can result in poor immune function

In conclusion, a balanced diet keeps our body fit and functioning well, while deficiency of vitamins A, D, and E causes vision problems, weak bones, and muscle or nerve issues.

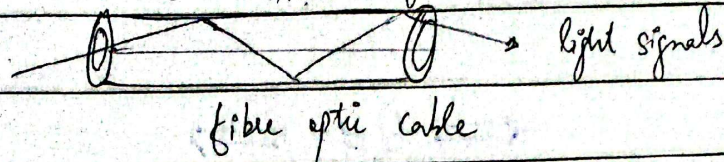
(d) Working of GPS (Global Positioning System) :-

- > GPS is a satellite-based navigation system that helps determine your exact location anywhere on Earth.
- > It consists of at least 24 satellites orbiting the Earth.
- > Your phone or GPS receiver picks up signals from at least 4 satellites.
- > Each satellite sends data about its position and the exact time.
- > By calculating how long each signal takes to reach the receiver, the system measures distance from each satellite.
- > Using this information, your exact position (latitude, longitude, and altitude) is calculated through a process called trilateration.



Fiber Optics :-

> Fibre optics are thin strands of glass or plastic that carry light data as light signals instead of electricity.
(total internal reflection).



- > They are used in internet cables, medical instruments and telecommunication systems because they transmit data faster and over long distances without much loss.
- > Example: High-speed broadband internet uses fibre optic cables to send information in the form of light pulses.

Measuring 2D and 3D locations by Satellites :-

- To find your 2D position (latitude and longitude) — signals from 3 satellites are needed.
- To find your 3D position (latitude, longitude and altitude) — signals from at least 4 satellites are required.
- The fourth satellite helps correct time errors and gives the height (altitude) of your position.

In conclusion, GPS works using satellite signals and trilateration. Fibre optics are light-carrying cables for fast communication. Satellites use 3 signals for 2D location and 4 signals for 3D positioning.

⇔ (Q#4) ⇔

(C) Methods of Solid Waste Management :-

Solid Waste Management means the proper handling, collection, treatment, and disposal of waste materials to protect human health and the environment.

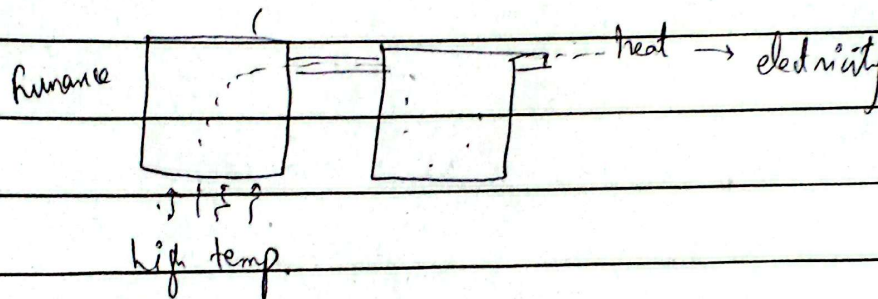
There are several methods used to manage solid waste effectively.

① Landfilling :-

- It is the most common method.
- Waste is buried in low-lying areas called landfills.
- Modern landfills are lined to prevent soil and water pollution.
- Advantage : Simple and Low-cost
- Disadvantage : Produces harmful gases and can cause groundwater pollution if not managed properly.

② Incineration (Burning of waste):

- Waste is burned at very high temperature in a furnace.
- The volume of waste is reduced and energy can be recovered.
- Advantage: Reduces waste volume and can produce electricity.
- Disadvantage: Can release air pollutants if not controlled.



③ Composting:

- Biodegradable waste (like food scraps, leaves, paper) is decomposed by microorganisms into manure or compost.
- Advantage: Produces natural fertilizer and reduces landfill use.
- Disadvantage: Takes time and requires proper conditions.

④ Recycling:

- Waste materials like paper, glass, plastic, and metals are reprocessed into new products.
- Advantage: Saves resources and energy, reduces

pollution:

- Disadvantage: Needs proper sorting and collection systems.

(5) Waste Minimization and Reuse:

- Reducing waste at the source (e.g., using reusable bags or containers)
- Reuse means using items again instead of throwing them away.
- Advantage: Most eco-friendly and cost-effective method

In conclusion, solid waste can be managed by reducing, reusing, recycling, composting, incineration, and landfilling. A combination of these methods helps keep the environment clean and sustainable.

(d) (i) Biofuel :-

Biofuel is a fuel made from living things such as plants or animal waste.

Example: Ethanol (from sugarcane) and biodiesel (from vegetable oils)

It is a renewable source of energy and helps reduce pollution.

(ii) Adulteration :-

Adulteration means mixing inferior or harmful substances with food, drink, or other products to increase profit.

Example : Mixing water in milk or adding colored chemicals in spices.

It makes food unsafe and unhealthy.

(iii) Hydrosphere :-

The hydrosphere includes all the water on Earth — in oceans, rivers, lakes, glaciers, and even water vapor in the air.

It covers about 71% of Earth's surface and supports all life.

(iv) Troposphere :-

The troposphere is the lowest layer of Earth's atmosphere, where we live and where weather changes (like rain, wind, and clouds) occur.

It extends up to about 8-15 km above the Earth's surface.

(v) Isotopes :-

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

Example : Carbon-12 and Carbon-14 are isotopes of carbon.

they have same chemical properties but different atomic masses.

(b) Role of Ribosomes in Protein Synthesis :-

Ribosomes are tiny, round structures found in all living cells — either floating freely in the cytoplasm or attached to the endoplasmic reticulum (forming rough ER). Their main function is to make proteins, which are essential for cell growth and repair. Here are the roles :

① Reading the Genetic Code :

- The instructions for making a protein are carried from the DNA to the ribosome by messenger RNA (mRNA)
- The ribosome 'reads' this mRNA sequence three letters (a codon) at a time.

② Bringing Amino Acids :

- Transfer RNA (tRNA) brings specific amino acids (the building blocks of proteins) to the ribosome according to the code on the mRNA

③ Joining Amino Acids :

- The ribosome helps link amino acids together in the correct order using peptide bonds, forming a long protein chain.

(4) Completing the Protein :

- When the whole mRNA message is read, the chain folds into a proper shape to become a functional protein.