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BATCH: 83 ISB

PART-II

QNo 2 (a) Answer:

Yes, I agree that "data is the new oil" because just like oil powered the industrial age late 18th century, data powers the digital age. Data helps businesses, governments and people make better decisions and create smarter systems by using data. However just like oil, raw data has little value until it's refined and analyzed.

Every Day Examples:

1 Online Shopping:

Websites like Amazon, Daraz etc use data from your past purchases and searches to recommend products you might like, it help them to sell more and improving your shopping experience.

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2 Navigation Apps:

Apps like Google Maps collect data from million of user's phones to show real-time traffic updates and suggest you the fastest routes.

3 Social Media:

Platforms like Facebook, Tiktok and Instagram etc used data or collect data about how you used them, Exempli gratia: what post or video you like, comment on, or share, how long you watch certain videos, which accounts you follow or search for, The app's system analyze that data to understand your interests and preferences to show you personalized content, keeping you engaged longer.

(b) Answer:

The Expanding Universe:

Scientists have discovered that our "universe is expanding" in the 1920s. When an American astronomer used the "**Hook Telescope**" in California, he observed distant galaxies and studied their light. He found that light from ~~all~~ almost all galaxies was redshifted, meaning the galaxies were moving away from us, and each other and the ~~faster~~ farther they are, the faster they move away.

To help understand this a British astronomer "**Eddington**" introduced the balloon analogy.

How balloon Analogy Resembles?

- Imagine you have a balloon, and you draw a few dots on the surface of balloon. Each dot represents a galaxy (like Milky way and Andromeda).
- The surface of balloon represents space. Now, when you blow air into the balloon, the balloon expands.

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- As it expands the distance between all the dots increases. The dots are not moving on their own but the surface (space) between them is stretching.

Similarly in real univers the galaxies are going away from each other, instead **space itself is expanding** carrying the galaxies with it. Just like the surface of balloon has no special center point, the universe doesn't have a center. Everything moves away from everything equally.

(c) Ans:

Balance Diet:

A balance diet means the one that contain adequate amount of food from five basic group of food, to supply essential nutrients in complete fulfillment of the requirement of the body. The basic five group include, **Milk, Meat, beans and Pulses, green leafy vegetables and cereal group.**

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From all the above groups we expect to achieve **Proteins, fats, carbohydrates, water, mineral, vitamins and fiber**

Deficiency of Vitamin A:

Vitamin A can cause ^{Deficiency of} **night blindness** (difficulty seeing in dim light)

can cause **dryness of Eyes and poor skin health.**

Deficiency of Vitamin D:

Vitamin D deficiency can cause **"Rickets"** in children (soft bones and weak bones)

It also leads to **poor calcium absorption.**

It can cause **bone pain and weakness** in adults.

Deficiency of Vitamin E:

Vitamin "E" can cause ^{Deficiency of} **muscles weakness and nerve problems.**

It may also lead to **poor vision and weak immune system.**

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(d) Ans:

Working of GPS:

The Global ~~Positioning~~ Positioning System (GPS) is a navigation system that helps us to determine the exact, position, speed, and speed of an object anywhere on earth, whether you are driving a car, flying a plane or using your phone.

- The satellite continuously sends out radio signals which contain satellite exact position in space and exact time the signal was sent.
- The GPS receiver picks up signal from at least four satellites and then the receiver measures how long each signal took to reach
- using a method called (Trilateration) the receiver find your exact position.

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Fiber Optic:

Fiber optic are thin, flexible strands of glass or plastic that transmit data in the form of light signals instead of electrical signals.

Structure:

CORE:

The thin glass center where light travels.

Cladding: A layer that reflects the light back in to the core.

Protective Coating:

A plastic layer that protects the fiber from damaging.

How it Works:

• When data is sent it is converted into light pulses. These light signals bounce inside the core and travel long distance without losing strength. At the other end these light signals converted back to electrical signals that devices can understand.

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Advantages:

- They are very fast data transmitters used in high speed internet.
- There is no electrical interference.
- Can carry data over long distances with very little ~~any~~ signal loss.

2D Location:

The receiver uses signals from at least 3 satellites and measures only **latitude** and **longitude** (your position on earth surface)

Example:

When your phone shows you moving along a road on a map but without your height or altitude.

3D Location:

Uses signals from 4 satellites and measures **latitude**, **longitude** and **altitude** also

For Example:

Fitness tracker shows your exact elevation in addition to your location.

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Section II

Q No 7 (a) Ans:

Volume of sphere:

Given Data

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

$$\text{Radius} = \frac{1}{2} \times \text{diameter} = \frac{1}{2} \times 14 = 7\text{cm}$$

$$\pi = 22/7$$

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

Put values

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

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

Multiply Numerators and Denominators:

So

$$\frac{30184}{21}$$

$$V = 1437.33 \text{ cm}^3$$

$$\begin{array}{r} \text{R. W} \\ 22 \\ \times 4 \\ \hline 88 \\ 343 \\ \times 88 \\ \hline 12794 \\ 2744 \times \\ \hline 30184 \end{array}$$

Infinity

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(b)

Total Saving = 25000 Rs
 Five Friends Ratio = 1:2:3:4:5

$$\text{Sum of Ratio} = 1+2+3+4+5 = 15$$

$$\text{Friend 1 Share} = \frac{25000}{15} \times 1$$

$$\boxed{\text{Smallest Share} = 1666.66 \text{ Rs}}$$

$$\begin{array}{r} \text{R.W} \\ 15 \overline{) 25000} \\ \underline{24990} \\ 100 \\ \underline{90} \\ 100 \\ \underline{90} \\ 10 \end{array}$$

(c) Ans

Spot the error/Complete the series:

i) 2, 6, 18, ~~54~~, 162, 486 (which number doesn't fit)

All the numbers fit in Pattern So, there is no error.

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

3, 5, 7, 11, 13, 17 the series follow Prime numbers Pattern.

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Q 6 (a) Ans

Let candies = x So

Apple = $3x$, Berry = $6x$, cherry = $2x$ and
date = $5x$

If Apple candies exceeded date candies
by 35 So,

$$3x - 5x = 35$$

$$-2x = 35 \Rightarrow x = \frac{35}{-2}$$

$$x = 17.5$$

Berry candies = $6x \Rightarrow 6(17.5)$

$$\boxed{\text{Berry Candies} = 105}$$

b) Ans :

Camera Price = 200\$

After discount = 200 dollar - 25%
= 150 dollars

After adding 6% tax = 6% of 150 =
= 0.06×150
= 9 dollars

Total amount paid = 150 + 9 dollars
Total amount paid = 159 dollars.