

23/10/25

(Part - II) (Section - I)

Q2: a) "Data is the new oil"....

Ans: Yes, I agree that data is the new oil. Just as oil powered the industrial age, data powers the digital age. Oil was once the world's most valuable resource; today, information and data drive businesses, governments, and technology. Those who control data hold great power and influence.

Everyday Life Example:

Example	How data works like oil
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- | | |
|---|--|
| 1) Online Shopping (e.g., Amazon) | Your buying data helps companies suggest what you may want next, just like refining oil gives valuable products. |
| 2) Social Media (e.g., Instagram, TikTok) | These apps collect your activity data to show content and ads you're |

- " " likely to enjoy - data
" " Fuels engagement.
3) Google Maps It gathers ^{location} data from
" " millions of users to predict
" " traffic and suggest faster
" " routes - turning data into
" " real-world benefits.

In today's world, data drives everything - From business decisions to daily life conveniences. Just like oil transform^{ed}ing the 20th century, data is transforming the 21st century.

b) Universe is expanding....

Ans: The expanding universe means that galaxies are moving away from each other as space itself stretches - just like dots on a balloon move apart when you blow air into it.

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 the right proportions. It helps the body grow properly, stay healthy, and fight diseases.

Example:

A balanced meal may include rice or bread (carbohydrates), meat or bones (protein), vegetables and fruits (vitamins and minerals), or milk and yogurt (calcium and fat).

Deficiency of vitamins and Their Effects:

Vitamin	Main Function	Deficiency cause	Resulting
Vitamin A	Keeps eyes and skin healthy.	Poor diet lacking in	Night blindness and dry, rough skin.
"	"	carrots, milk, or leafy vegetables	"

vitamin D	Helps body absorb	Lack of sun-	Rickets in
"	calcium for strong	light or dairy	children (soft,
"	bones and teeth.	products.	weak bones)
"	"	"	and osteomala-
"	"	"	cia in adults.
vitamin E	protects cells and	Lack of nuts,	Muscles weak-
"	tissues from damage	seeds, and	ness, nerve
"	(antioxidant).	green vegetables.	damage, and
			poor immuni-
A balanced diet keeps the body			
strong and active.			

d) Discuss work of GPS...

Ans: Definition:

GPS is a navigation system that helps find the exact location (latitude, longitude, and altitude) of any objects or person on Earth.

1) GPS Works:

a) **Satellites in Orbit:** About 24 satellites continuously orbit the Earth, sending out radio signals with their

location and time.

b) **GPS Receiver on Earth:** A GPS receiver (in your mobile, car, or Smartwatch) picks up signals from at least 4 satellites.

c) **Distance Calculation:** The receiver calculates how long it took for each satellite's signal to arrive → this gives the distance from each satellite.

2) **Fiber Optic:**

Fiber optic is a thin glass or plastic wire that carries data as light signals instead of electrical signals.

3) **Measuring 2D and 3D Locations by Satellites:**

Type	Satellite Needed	Information Provided	Eg
2D location	3 Satellites	Latitude, longitude	To find

"	"	"	(position on Earth's Surface)	your position on a flat map.
3D location	4 or more satellites	"	Latitude + longitude + Altitude (height above sea level)	For aircraft, ships, or GPS navigation.
"	"	"	"	"
"	"	"	"	"

Q.3. a) Why cells form organelles?...

Ans: Cells Need Organelles:

1) **Division of Labor:** Each organelle has a specific job - for example, mitochondria produce energy, while the nucleus controls cell activities.

2) **Organization:** Organelles keep different chemical reactions separate, so everything happens in an orderly way.

3) **Survival and Growth:** Organelles help the cell perform vital processes like respiration, protein synthesis, and

waste removal.

Mitochondria in Human Cell:

Mitochondria are tiny, rod-shaped organelles found in almost all human cells. They are often called the "powerhouse of the cell" because they produce energy in the form of ATP (Adenosine Triphosphate).

Functions of Mitochondria:

- 1) They break down glucose (sugar) and oxygen to release energy →
 $\text{Glucose} + \text{oxygen} \rightarrow \text{Energy (ATP)} + \text{Carbon Dioxide} + \text{water}.$
- 2) Mitochondria control chemical reactions that keep cells alive.
- 3) They help remove damaged cells → keeping the body healthy.

b) What is doping? ---

Ans Doping:

Doping is the process of adding a small amount of impurity (another element) to a pure semiconductor to change its electrical conductivity.

Types of Semiconductors:

1) N-type Semiconductor:

"N" stands for negative $\rightarrow$ more electrons are available.

How It Made:

- Add a pentavalent impurity (an element with 5 valence ~~electrons~~ electrons)

Such as:

- Phosphorus (P)
- Arsenic (As)
- Antimony (Sb)
- It carries main charge like electrons (negative charge).

2) P-type Semiconductors:

"P" stands for positive $\rightarrow$ more holes are available.

- It is made by adding a

trivalent impurity (an element with 3 valence electrons) such as:

- Boron (B)
- Aluminum (Al)
- Gallium (Ga)

In its holes, it have positive charge.

Both are essential for building electronic components.

c) State some of the merits...

Ans Merits:

- 1) **Fertile Soil:** Volcanic ash and lava break down into rich minerals, making the soil very fertile for farming.

Example: The soil around Mount Vesuvius in Italy is great for growing grapes and tomatoes.

- 2) **Mineral Resources:** volcanoes bring valuable minerals like gold, silver,

copper, and diamonds to the Earth's surface.

3) **Geothermal Energy:** The heat from ~~volcanic~~ volcanic areas can be used to produce electricity, and hot water (geothermal energy).

Example: Iceland uses volcanic heat to power homes.

2) **Demerits:**

1) **Loss of Life and Property:**

Eruptions can destroy towns and kill people, animals, and plants.

2) **Air Pollution:**

Volcanic ash and gases (like sulfur dioxide) pollute the air, causing breathing problems and acid rain.

3) **Destruction of crops and forests:**

Lava and ash can cover large

areas, burning vegetation and ruining farmland.

d) What is dengue? ---

Ans: Dengue:

Dengue is a viral disease transmitted to human through the bite of infected Aedes mosquitoes, mainly *Aedes aegypti* and *Aedes albopictus*.

Symptoms:

Symptoms usually appear 4-10 days after being bitten by an infected mosquito. Common signs include.

- 1) High fever (up to 104°F / 40°C)
- 2) ~~Severe~~ Severe headache
- 3) Pain behind the eye
- 4) Muscle and joint pain
- 5) Nausea and vomiting
- 6) Skin rash appearing 2-5 days

after fever.

7) Fatigue and weakness.

Remedies and Treatment:

There is no specific antiviral drug for dengue, but symptoms can be managed through:

- 1) Rest - Adequate bed rest is essential
 - 2) Hydration - Drink plenty of fluids (waters, soups, juices) to prevent dehydration.
 - 3) Fever and pain relief: use paracetamol (acetaminophen)
-
-

Math's Paper

Q No: (a) Ratio of candies:

Apple : Berry : Cherry : Date = 3 : 6 : 2 : 5

multiplying factor be x

So,

- Apple = $3x$

- Berry = $6x$

- Cherry = $2x$

- Date = $5x$

Given:

Apple candies exceed date candies by 35.

$$\text{So, } 3x - 5x = 35$$

$$- 2x = 35$$

$$x = 17.5$$

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

105 Berry candies

(b)

Camera price calculation

original Price = \$ 200

Discount = 25%

$$\begin{aligned} \Rightarrow \text{Discounted price} &= 200 - (25\% \text{ of } 200) \\ &= 200 - (0.25 \times 200) \\ &= 200 - 50 \end{aligned}$$

$$= \$ 150$$

Now apply 6% tax:

$$= 150 + (6\% \text{ of } 150)$$

$$= 150 + (0.06 \times 150)$$

$$= 150 + 9$$

$$\text{Total amount} = \$ 159.$$

c) Bicycle journey:

$$\text{Distance} = 36 \text{ km}$$

$$\text{Speed} = 18 \text{ km/hr}$$

$$\text{Time} = \text{Distance} \div \text{Speed} = 36 \div 18 = 2 \text{ hrs}$$

$$\text{Starting time} = 1 \text{ pm}$$

$$\rightarrow \text{Arrival time} = 1 \text{ pm} + 2 \text{ hours} = 3 \text{ pm}$$

$$d) = ?$$

Q No 7: a) Volume of a sphere:

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

$$\text{Diameter} = 14 \text{ cm} \rightarrow \text{Radius} = 7 \text{ cm}$$

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

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

Simplify:

$$V = \frac{4 \times 22 \times 343}{21} = \frac{30184}{21} \approx 1437.33 \text{ cm}^3$$

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

b) Ratio of savings

$$\text{Total} = 25,000 \text{ Rs}$$

$$\text{Ratio} = 1:2:3:4:5$$

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

$$\text{value of one} = 25,000 \div 15 = 1666.67 \text{ Rs}$$

$$\text{Smallest share} = 1666.67 \text{ Rs Ans}$$

c) Series Questions

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

Each number is $\times 3$ of the previous:

$$2 \times 3 = 6, 6 \times 3 = 18, 18 \times 3 = 54, 54 \times 3 = 162,$$

$$162 \times 3 = 486 \text{ Ans}$$

ii) 3, 5, 7, 11, 13 —

These are prime numbers.

next prime number $13 = 17$

17 Answer.

d) Triangle with sides 5cm, 12cm,
13 cm

$$\text{check: } 5^2 + 12^2 = 25 + 144 = 169 = 13^2$$

right-angled triangle, right angle
opposite the longest side (13 cm).

So, Angle C = 90°

$$\sin A = \frac{5}{13} \Rightarrow A = \arcsin\left(\frac{5}{13}\right) \approx 22.62^\circ$$

$$B = 180^\circ - (90^\circ + 22.62^\circ) = 67.38^\circ$$

$$\text{Angles} = A \approx 22.62^\circ, B = 67.38^\circ, C = 90^\circ$$
