

Date: _____

SECTION - I

Day: _____

QUESTION - 02 (d)

(a)

'Data is the new oil':

Yes, I agree. "Data is the new oil", just as like oil was valuable in the past to run machines and oil industries. Data now is used to run our digital world. From recommendation systems that refer us movies, videos, and advertisement to Predictive analysis models for weather forecasting to trade predictions, all depend and run on data. Emergence and emphasis on new fields of study like Data science prove the importance of data in this era.

Everyday Examples:

1. Online Shopping:

E-commerce platforms like Daraz, Temu, Amazon, based on user's ^{previous} data or demographic data recommend product to users that boosts their sales.

2. Social Media

Social Media Platforms like Youtube, Instagram, Facebook, Snapchat, Netflix recommend you content based on your previous watch history and suggest you friends either based on your or your friend list's data.

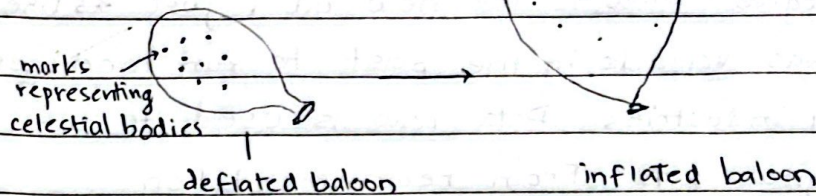
3. Maps & Navigation.

^{Google} Maps and other navigation application use real-time data from user's phone to show traffic and suggest fastest routes.

(b)

Expanding Universe

Yes, the Universe is expanding at an ⁽⁵⁾ accelerating speed



It does resemble a ~~bl~~ balloon blowing in working as if we put ^{some} marks on a ^{deflated} balloon ~~at~~ the marks will be near each other but when we blow air in the balloon the marks (galaxies) start moving away from each other.

This represents that the space between the galaxies is increasing, ~~also increasing the~~ distance between the galaxies.

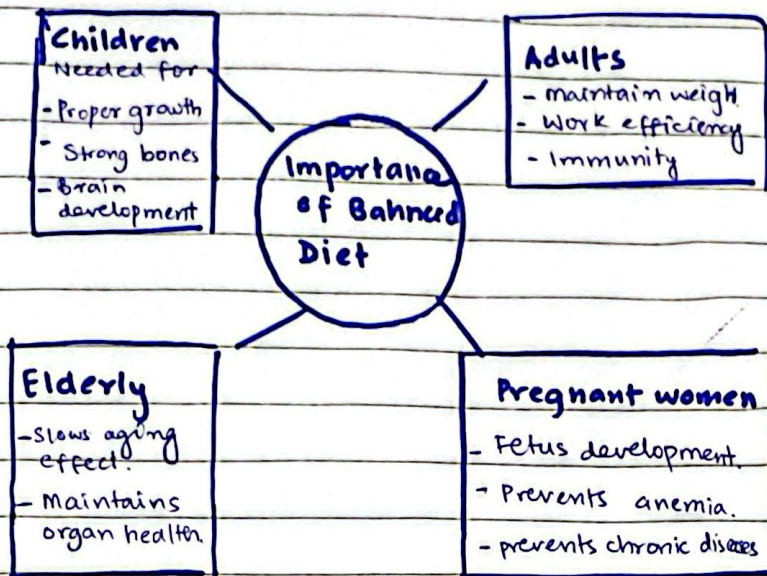
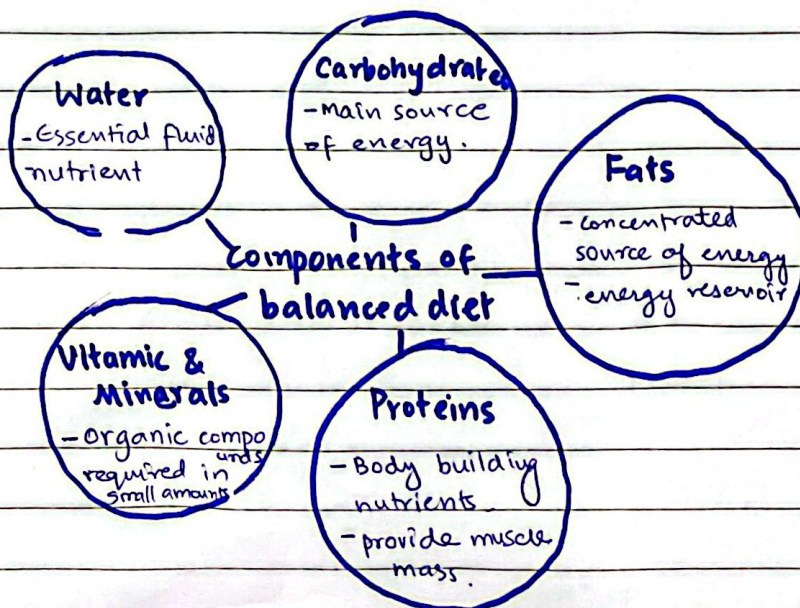
Also, the galaxies are not moving away from from each just like some exciting particles would move rather only the expanding space is increasing the distance ^{due to which} and ^{phenomenons} like Red Shift and Blue Shift are observed.

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(c)Balanced diet

A diet that includes proportionate amounts of all nutrients e.g., carbohydrates, Fruits, Vegetables, Vitamins and Minerals, Proteins, Lip Fats and Water; required by the body to stay healthy.

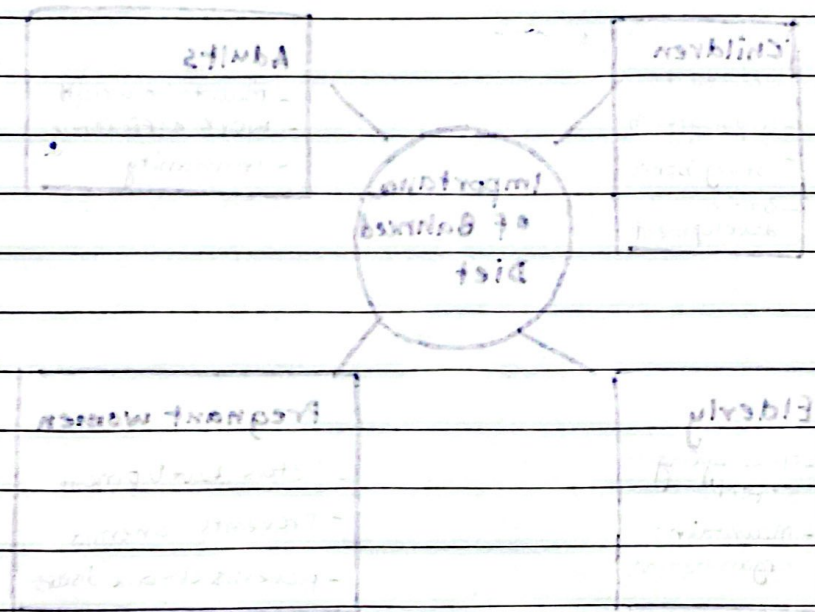
Components of balanced diet:

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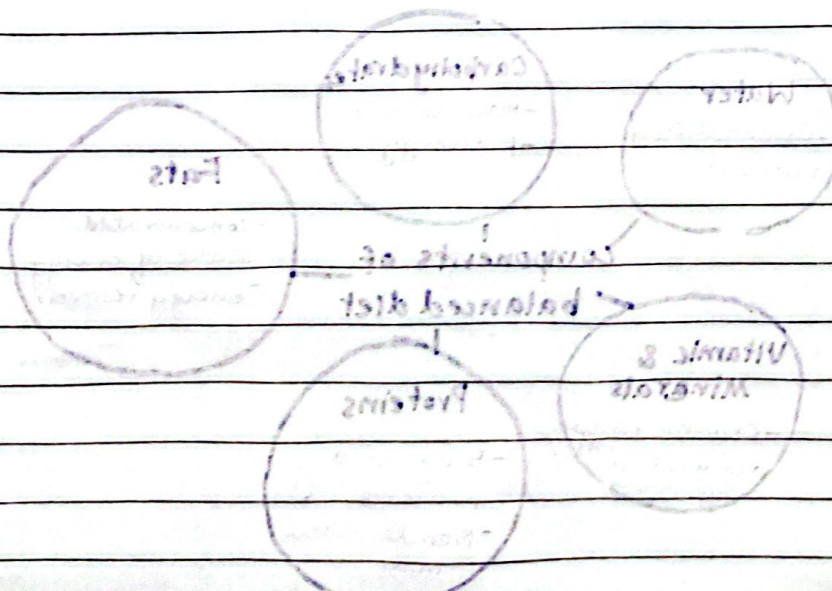
Day: _____

(5)

Vitamins	Deficiencies
Vitamin A	Night Blindness
Vitamin D	Osteoporosis, Osteomalacia, Rickets
Vitamin E	Muscle weakness, nerve damage



Components of balanced diet:



QUESTION - 05

(a)

Pakistan's population explosion conundrum:

Pakistan is the fifth populous country of the world with 241.5 million people according to 2023 census. There are a number of causes of population explosion.

Causes:

1. Lack of Education:

people with

^ Lack of education and awareness in low literacy areas are unaware of family planning

2. Religious beliefs:

Some communities refer family planning/birth control against Islam or uncultural.

3. Early marriages:

Early marriage expose people to long child bearing time periods resulting in more children.

4. Lack of access to family control planning:

Health care facilities and contraceptives are not easily available.

5. Poverty

Poor families often have more children, hoping they will earn more.

6. Preference for sons.

Families may keep having children ^{until} they get a male child.

QUESTION - 05

Control measures:

1. Improve Education: (5)
Educating ^{both} men and women about family planning can reduce birth rates.
2. Promote family planning.
Government and NGOs should provide free and low-cost contraceptives and awareness campaigns.
3. Woman Empowerment: : 292/110
When women are educated and involved in jobs, they tend to marry later & have fewer children.
4. Awareness through social media:
Through TV, social media and other platforms promote small family ideas and inform people about the harms of ^{large} ~~to~~ populations.
5. Discourage Early Marriages:
There should be ^{strict regulation of} ~~early marriages~~ minimum marriage age - limit laws to prevent early marriages.
6. Improve Health care access:
Providing accessible reproductive health in both urban and rural areas can also counter the issue.
7. Communal efforts:
Integrating community elders, religious ~~at~~ authorities and personalities to raise awareness can also help.

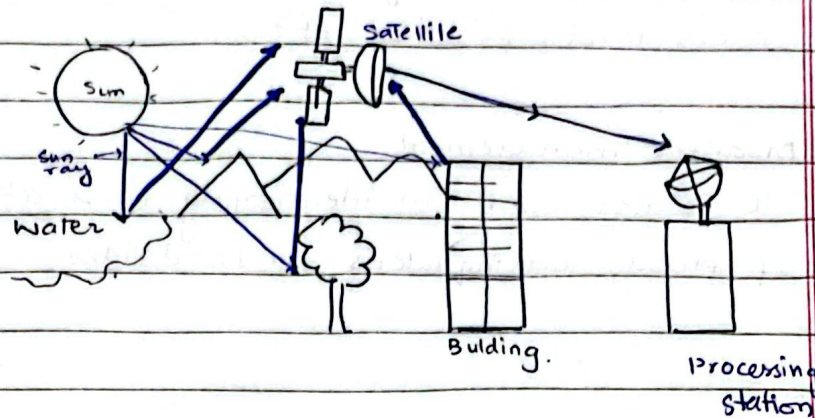
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(b)

Remote sensing:

It is the process of collecting information about an object ^{or} area from distance without contact.



In environmental sciences remote sensing is often done using satellites, drones or aircrafts which use sensors to capture images and data about earth's surface.

Examples:

- Monitoring deforestation
- Measuring changes in glaciers & sea levels.
- Tracking weather patterns like sea storms, etc.

→ Role of GIS in environmental science:

GIS (Geographic Information system) is a computer-based system used in collecting, analyzing displaying geographic data.

1. Mapping & Monitoring:

GIS help in collecting detailed maps of forests, rivers, land, pollution, etc.

2. Disaster management:

It is also used in identifying area at risk of flood, earthquakes or landslides.

3. Environmental Planning:

It supports sustainable planning by helping choose suitable locations for agriculture, housing, etc without harming the environment.

4. Wildlife Protection:

GIS is also used to track animal ^{ve} movements and habitat loss to help & conservation efforts.

(C)

Atmosphere is blanket of Earth:

Atmosphere does act as blanket of the earth as it:

1. Protects from harmful rays:

Ozone layer in stratosphere traps

harmful UV radiations from

Sun.

2. Regulates Temperature:

Just like a blanket keeps us warm, gases

atmosphere traps heat through greenhouse effect,

keeping earth's temperature suitable for life.

3. Protects from outer celestial bodies:

Atmosphere burns up many small meteors

before they hit earth's surface. As soon as

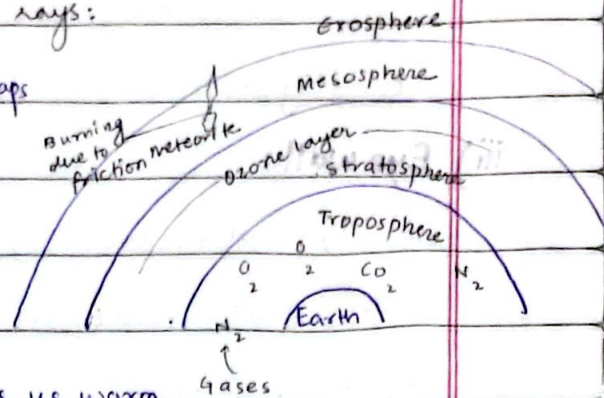
meteors enter mesosphere they start burning due to friction.

4. Provides O_2 and CO_2

Gases like Oxygen and Carbon dioxide

are in atmosphere for are essential

for humans and plants.



(d) (c)

i) **Hydrometer:**

Hydrometer is an instrument used to measure density of a liquids.

ii) **Epic center:**

Epicenter is the point on earth's surface directly above the focus (origin) of earthquake.

iii) **Eye wall:**

The eye wall is the ring of intense thunderstorms that surrounds the calm center (eye) of the cyclone.

4) **Deep Focus:**

Deep focus earthquake is one that originates more than 300 kms below earth's surface.

5) **Light Year:**

A light year is the unit to measure distances between celestial bodies. The amount the distance a light travels in 1 year is light year.

- Speed of Light is 0.3×10^6 m/s.

- Distance Light travels in 1 year is 9.46 billion kilometers.

1 light year = 9.46 billion km.

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SECTION - II

Day: _____

QUESTION - 06(a)

Apple : Berry : Cherry : Date.

$$3x : 6x : 2x : 5x$$

$$\text{Number of Apples} = \text{Number of Dates} + 35$$

$$3x = 5x + 35$$

$$3x - 5x = 35$$

$$-2x = 35$$

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

$$x = -17.5$$

since quantity of ^{candies} ~~berries~~ can't be negative $x = 17.5$.

$$\text{Number of berries} = 6x$$

$$= 6(17.5)$$

$$\text{No of Berry candies} = 105 \text{ candies}$$

(b)

$$\text{Price of camera} = 200 \$$$

$$\text{Discount} = 25\%$$

$$\text{Discounted price} = 200 \$ \times \frac{25}{100} = 50 \$$$

$$\text{Discounted price} = 200 \$ - 50 \$ = 150 \$$$

$$\text{Tax} = 6\%$$

$$\text{Tax amount} = 150 \$ \times \frac{6}{100} = 9 \$$$

$$\text{Amount after adding tax} = 150 \$ + 9 \$ = 159 \$$$

$$\text{Total Amount Paid} = 159 \$$$

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(c)

Distance covered by bicycle = 36 km

Speed = 18 km/hr

Starting Time = 1 pm

Finishing time = ?

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

Time = $\frac{\text{Distance}}{\text{Speed}} = \frac{36 \text{ km}}{18 \text{ km/hr}} = 2 \text{ hrs}$

Finishing time = 1 pm + 2 hrs = 3 pm

Finishing time = 3 pm

(d)

i) STS TAICIS → STATISTICS

ii) LGEMBAR → GAMBLER

(d)

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QUESTION - 07(a)

Diameter of sphere = 14 cm.

Radius = $\frac{\text{Diameter}}{2} = 7 \text{ cm.}$ Volume of sphere = $\frac{4}{3} \pi r^3$.

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

$$= \frac{4 \times 22 \times 49}{3}$$

$$= 29.33 \times 49$$

$$\text{Volume of sphere} = 1437.33 \text{ cm}^3$$

(b)

Five friend's total saving = 25,000 Rs.

Let the friends be A, B, C, D, and E.

Friend A : B : C : D : E.

Ratio Share 1 : 2 : 3 : 4 : 5

Share Ratios sum of all ratios = 1+2+3+4+5 = 15

$$\text{A's share} = \frac{25,000 \times 1}{15} = 1666.67 \text{ Rs.}$$

$$\text{B's share} = \frac{25,000 \times 2}{15} = 3333.3 \text{ Rs.}$$

$$\text{C's share} = \frac{25,000 \times 3}{15} = 5000 \text{ Rs.}$$

$$\text{D's share} = \frac{25,000 \times 4}{15} = 6666.68 \text{ Rs.}$$

$$\text{E's share} = \frac{25,000 \times 5}{15} = 8333.35 \text{ Rs.}$$

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A got the smallest share = 1666.67 Rs.

(c)

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

$$2 \times 3 \rightarrow 6$$

$$6 \times 3 \rightarrow 18$$

$$18 \times 3 \rightarrow 54$$

$$54 \times 3 \rightarrow 162$$

$$162 \times 3 \rightarrow 486$$

$$\begin{array}{r} 2 \\ 18 \\ 18 \\ 18 \\ 54 \\ 162 \\ 162 \\ \times 3 \\ \hline 486 \end{array}$$

All the terms fit the series

ii) 3, 5, 7, 11, 13, 17

Each term is a prime number and the prime number after 13 is 17.

(d)

(d)

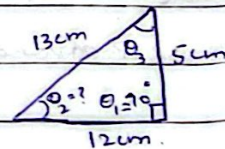
Sides of triangle = 5cm, 12cm, 13cm.

Angles = ?

checking if triangle is a right angled triangle using Pythagoras theorem.

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

$$25 + 144 = 169$$



This Triangle is right angled triangle.

$$\theta_1 = 90^\circ$$

$$\sin \theta = \frac{\text{opposite side}}{\text{hypotenuse}} \quad \sin \theta = \frac{5}{13}$$

$$\theta = \arcsin\left(\frac{5}{13}\right) = 22.62^\circ$$

$$\theta_3 = 180^\circ - 90^\circ - 22.62^\circ = 67.38^\circ$$