Dos and Don'ts for the General Science & Ability Paper

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 according to 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 running late.
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. Watch your spelling and grammar. While GS / does't deduct marks for these, your expression leaves an impression.
6. In the ability section, explain every ability question in words. For a 5-mark part, show all steps and provide clear explanations.

Here's a brief key/sample of your Ability questions

Q.5

a) Candy ratio problem

Given: 3 flavors Apple : Berry : Cherry : Date = 3 : 4 : 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 = 5 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 3:5). Two ways to handle this:

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

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

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

So 5k − 3k = 35 → 2k = 35.

Solution: 2k = 35 → k = 35 ÷ 2 = 17.5.

Berry = 4k = 4 × 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) Compound discount + tax

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

Asked: Total amount paid.

Formula(s) used:

Discount amount = 25% of 200 = 0.25 × 200.

Sale price = 200 − discount.

Tax = 6% of sale price

Total = sale price + tax.

Solution (step by step):

Discount = 200 × 0.25 = 50.

Sale price = 200 − 50 = 150.

Tax = 6% of 150 = 9.

Total paid = 150 + 9 = 159.

Answer: $159.00

c) Bicycle travel time

Given: Distance = 36 km, speed = 18 km/h, start time = 1:00 PM.

Asked: Arrival time.

Formula: Time = Distance ÷ Speed.

Solution: Time = 36 ÷ 18 = 2 hours. Start 1:00 PM + 2 hours = 3:00 PM.

Answer: 3:00 PM

d) Understand of math terms

Q.7

Given:

Diameter of sphere = 14 cm

Radius (r) = 14/2 = 7 cm

π = 22/7

Asked: Volume of sphere

Formula:

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

Now substitution in the value

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

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

$= 1437.33$ cm³

Answer:

The volume of the sphere is approximately 1437.33 cm³.

(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) × total.

PART - I

SECTION - I

33

Q.No. 2 Part (a.) Answer:

Yes, I completely agree that data is the new oil in today's world. Just like oil powered the industrial age, data powers the digital age. Those who control and process data today hold the real economic and political power. Data has become the main resource that drives innovation, decision-making, and even influence in modern societies.

In the 21st century, companies, governments, and individuals all depend on data to plan, predict, and perform better. It fuels artificial intelligence, online marketing, financial systems, and even governance models. However, like oil, data also requires refining; it means data must be analyzed, organized and interpreted to create real value.

Examples:

Online shopping platforms (Daraz, Amazon): These companies collect data about what people search and buy, then use it to recommend products. This

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data - driven personalization increases their sales dramatically.

↳ Social Media (Instagram, Facebook, n): Social platforms analyze users data; likes, interests, and activity, to show targeted ads. This is why social media companies earn billions without charging users directly.

↳ Navigation Apps (Google Maps) use real-time traffic and locations data from millions of phones help users find the quickest routes. Without this data, such services wouldn't function.

In short, data has become the backbone of the global economy, shaping markets, technology, & even human behaviour. Managing it responsibly like a precious resource, is now one of the greatest challenges of our digital era.

Part.(b:) **Answer:**

The expansion of the universe is often compared to a ballon being blown up because both show how space itself streches rather than objects moving through space. When we blow air into a ballon, its surface expands,

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and every point on it moves away from every other point. Similarly, in the universe, galanies are not flying outward through space, but rather space itself is enpanding, causing galanies to drift apart.

In this analogy, the surface of the balloon represents the fabric of space, and the dots on it represent galanies. As the ballon inflates, each dot moves away from the other dots, yet none of them are at the "center" of enpansion. Just as no galany is at the center of the universe.

This idea supports the Big Bang Theory which states that the universe began from a single, entremly dense point and has been enpanding ever since.

The balloon model helps us visualize how the distance between galanies increases over time, proving that the universe is continuously enpanding in all directions.

In short: Just as a balloon's surface grows where air is added, the universe's space stretches, carrying galanies apart, not because they're moving through space, but because space itself is enpanding.

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Part. (C:) **Answer:**

A balanced diet is one that provides all the essential nutrients in the right proportions to maintain good health, growth, and proper body functioning. It should include carbohydrates, proteins, fats, vitamins, minerals and water in appropriate amounts. A balanced diet ensures that the body has enough energy, strengthens immunity, supports mental and physical development, and helps prevent diseases.

Deficiency of vitamins A, D, and E can cause the following imbalances:

↳ Vitamin A deficiency:

- Leads to night blindness and vision problems.
- Causes dry skin and hair also increases susceptibility to infection.
- Severe deficiency can cause xerophthalmia, which may lead to permanent blindness.

↳ Vitamin D deficiency:

- Results in weak bones due to poor calcium absorption.
- In children, it causes rickets, leading to bone deformities.
- In adults, deficiency may result in

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osteomalacia, causing soft bones and pain.

↳ Vitamin E deficiency:

- Leads to muscle weakness and poor coordination.
- Can cause immune system problems, making the body more prone to infections.
- In severe cases, may lead to nerve damage.

Conclusion:

A balanced diet is essential to prevent these deficiencies. Consuming fruits, vegetables, dairy, fish, nuts and whole grains regularly ensures adequate intake of vitamins A, D, and E, supporting overall health and normal body functions.

Part. (d:) Answer:

↳ Working of GPS (Global Positioning system):

GPS is a satellite based navigation system that helps determine the exact location of a person or object anywhere on Earth. It works using a network of at least 24 satellites orbiting the Earth. Each GPS satellite continuously sends signals containing its location and time.

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A GPS reciever on Earth recieves Signals from three or more satellites and calculates its position using a method called trilateration.

- 2D Positioning (latitude and longitude) requires Signals from three satellites.
- 3D Positioning (latitude, longitude, and altitude) requires signals from four or more satellites.

In simple terms, the GPS reciever calculates how far it is from each satellite by measuring the time taken for the signal to reach it, then determines the enact location on Earth.

↳ What is Fiber optic?

Fiber optic is thin, flexible strands of glass or plastic that transmit light signals over long distances. They are used in telecommunication and internet networks because they allow fast and high-capacity data transmission with minimal loss. Fiber optic cables are more reliable and faster than traditional copper cables because light travels at high speed and is less affected by interference.

↳ How 2D & 3D locations are measured

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by satellites:

- 2D Location: The receiver calculates distances from at least three satellites. Using trilateration, it finds the intersection point of three spheres, giving latitude and longitude.
- 3D Location: To include altitude, the reciever needs signals from four satellites. This fourth signal allows the reciever to account for time errors in the receiver's clock and gives an accurate latitude, longitude, and altitude.

Conclusion:

GPS and fiber optics together form the backbone of modern navigation and communication. GPS ensures accurate positioning and navigation, while fiber optics provide high-speed data transfer, making them essential in today's connected world.

Q.No.5. Answer:

Part.(a):

↳ causes of Population Explosion in Pakistan:

- High Birth Rate: Many families still prefer more children due to cultural

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and economic reasons.

- Early Marriages: Early age of marriage increases the reproductive span.
- Lack of Awareness: Limited knowledge about family planning and contraception.
- Poverty: Children are often considered economic assets to support family work.
- Improved Healthcare: Reduced death rates without a proportional reduction in birth rates.

↳ Control Measures:

- Family Planning Programs: Promote awareness of contraception and birth control.
- Education: Educate women and communities about the benefits of smaller families.
- Delayed Marriages: Encourage marriage at a responsible age.
- Goverment Policies: Incentives for small families and penalties for unchecked population growth.
- Healthcare Awareness: Combine better healthcare with family planning to balance population growth.

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Part. (b). Answer:

Remote Sensing:
Remote Sensing is the technique of collecting information about Earth's surface without physical contact, usually through satellites or aircraft. It helps monitor land use, forests, water bodies, weather patterns, and environmental changes.

Role of GIS (Geographic Information system) in Environmental Science:

- Mapping and Monitoring: GIS helps create detailed maps of forests, rivers, urban areas, and pollution zones.
- Disaster Management: Assist in predicting floods, cyclones, and earthquakes.
- Resource Management: Help in planning sustainable use of water, minerals, and forests.
- Environmental Analysis: Tracks deforestation, soil erosion, and climate change trends.
- Decision Making: Enables policymakers to take informed decisions for conservation and planning.

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Part. (c). Answer:

The atmosphere acts like a protective blanket around Earth because:

- Temperature Regulation : It traps heat from the sun, keeping the Earth warm enough for life (Greenhouse Effect).
- Protection from Harmful Radiation: The ozone layer absorbs dangerous UV rays.
- Protection from [redacted] Meteoroids : Small meteoroids burn up in the atmosphere before reaching Earth.
- Supports Life : Provides oxygen, carbon dioxide, and nitrogen essential for living organisms.
- Weather and Water cycle : Controls rainfall, wind, and climate, making life possible.

In short, just like a blanket it protects us from cold, the atmosphere protects and sustains life on Earth.

Part. (d) Answer:

(i) Hydrometer:
An instrument used to measure

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the density or specific gravity of liquids, such as milk or water.

↳ **Epicenter:**
The point on Earth's surface directly above the focus of an earthquake, where the shaking is strongest.

↳ **Eye Wall of Cyclone:**
The ring of strong winds surrounding the calm center (eye) of a cyclone, where the most severe weather occurs.

↳ **Deep Focus:**
An earthquake whose focus (origin point underground) is located at a depth greater than 300 km beneath the Earth's surface.

↳ **Light Year:**
The distance that light travels in one year, approximately 9.46 trillion kilometers, used to measure astronomical distances.

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Section - II

Q. 6. Answer:

Flavors Apple : Berry : cherry : Date = 3 : 6 : 2 : 5

Let the common multiple = n

- Apple candies = 3n
- Berry " = 6n
- cherry " = 2n
- Date " = 5n.

Apple candies exceed Date candies by 35.

3n - 5n = -2n = 35

(Apple > Date, so 3n - 5n = ?)

Apple = 3n, Date = 5n

3n - 5n = -2n = -35 => 2n = 35 => n = 17.5

- Berry candies = 6n = 6 × 17.5 = 105

Answer: 105 Berry candies.

(b). original Price = $200

- Discount = 25% of 200 -> 0.25 × 200 = 50
- Price after discount = 200 - 50 = $150
- Tax = 6% of 150 -> 0.06 × 150 = 9
- Total amount Paid = 150 + 9 = $159

Answer: $159

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(c)

Distance = 36km Speed = 18km/hr

Time = Distance ÷ Speed

= 36 ÷ 18

= 2 hours

Starting time = 1:00 PM

Arrival time = 1 PM + 2 hours

= 3:00 PM

Answer: 3:00 PM

(d) (i) STSTAICITS → STATISTICS

(ii) LGEBMAR → ALGEBRA