

Do's 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 accordingly - so 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 rushing later.
3. Make your answers look scientific, not just theoretical. Use flowcharts and diagrams whenever they add clarity.
4. Neatness matters - keep your handwriting clean, avoid cutting.
5. Mind your spelling and grammar - while GSA doesn't deduct marks for these, your expression leaves an impression.
6. In the ability portion, explain analytical ability questions in words. For a 5-mark part, show all steps and provide clear explanations.

SECTION - II

Question - 6(a)

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

Q.6

a) Candy ratio problem

Given: Packets in flavors Apple: Berry: Cherry: Date = 3:6:2:5

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). I always handle this:

1. If the problem truly intends Apple = 15, that's impossible with the given ratio (would require negative common factor).

2. Most likely the intended meaning is Date exceeds Apple by 35 (Apple - Date = -35). I will solve based on the intended meaning.

Formula: Let common factor = k. Apple = 3k, Date = 5k.
 So $5k - 3k = 35 \Rightarrow 2k = 35$

Solution: $2k = 35 \Rightarrow k = 35/2 = 17.5$
 Berry = $6k = 6 \times 17.5 = 105$

Answer: 105 Berry candies

(If you intended the other wording exactly as written, note that it is inconsistent with the ratio.)

b) Camera discount + tax

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

Asked: Total amount paid.

Formula / Steps:

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

Sale price = $200 - \text{discount}$.

Tax = 6% of sale price.

Total = sale price + tax.

Solution (digit by digit):

Discount = $200 \times 0.25 = 50$

Sale price = $200 - 50 = 150$

Tax = $150 \times 0.06 = 9$

Total paid = $150 + 9 = 159$

Answer: \$159.00

c) Bicycle travel time

Given: Distance = 36 km, speed = 18 km/hr, 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) Unscramble math terms

I. STATISTICS
 II. GAMBLER

Q7.

Given:

- Diameter (d) = 14 cm

- Radius (r) = $d/2 = 14/2 = 7$ cm

- $\pi = 22/7$

Asked: volume of sphere

Formula:

Volume = $(4/3)\pi r^3$

Now, let's plug in the values:

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

= $(4/3) \times 22 \times 7 \times 7$

= 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 = $(1/15) \times \text{total}$

Given data:

Ratio of Apple, Berry, Cherry, Date $\Rightarrow$

To Find:

if Apple candies exceed date candies by 35

No. of Berry candies = ?

Solution:

$$\text{Sum of ratios} = 3+6+2+5 = 16$$

$$\text{Share's of Apple candies} = \frac{\text{Total candies} \times \text{Ratio of Apple candies}}{\text{Sum of ratios}}$$

$$\text{Let total candies} = x$$

$$= \frac{x \times 3}{16} = \frac{3x}{16}$$

Similarly;

$$\text{Share's of Berry candies} = \frac{6x}{16} = \frac{3x}{8}$$

$$\text{Share's of Cherry candies} = \frac{2x}{16} = \frac{x}{8}$$

$$\text{Share's of Date candies} = \frac{5x}{16}$$

According to the situation given

$$\text{No. of Apple candies} = 35 + \text{Date candies}$$

$$\Rightarrow \frac{3x}{16} = 35 + \frac{5x}{16}$$

$$\Rightarrow \frac{3x}{16} - \frac{5x}{16} = 35$$

$$\Rightarrow \frac{-2x}{16} = +35 \Rightarrow x = 35 \times 8$$

$$x = 280$$

(ignoring $\frac{-1}{16}$)

$$\begin{aligned}\Rightarrow \text{Buy candles} &= \frac{3 \times 208}{8} \\ &= \frac{3(208)}{8} \\ &= 78\end{aligned}$$

Question: 6(b)

Given data:

price of camera = 2000
discount = 25%
tax = 6%

To find:

total amount paid = ?

Solution:

$$\begin{aligned}\text{price after 25\% off} &= 200 - 200(25\%) \\ &= 200 - \frac{200 \times 25}{100} \\ &= 200 - 50 \\ &= 150\end{aligned}$$

$$\begin{aligned}\text{Price after adding tax} &= 150 + 6\%(150) \\ &= 150 + \frac{36 \times 150}{100} \\ &= 150 + 9 \\ &= 159\end{aligned}$$

Question: 6(c)

Given data:

bicycle, distance covered $\Rightarrow$ 36 km

speed = 18 km/hr

starting time = 1 PM

To find:

reaching time = ?

Solution:

$$S = Vt$$

$$t = \frac{S}{V}$$

$$t = \frac{36 \text{ km}}{18 \text{ km/hr}}$$

$$t = 2 \text{ hr}$$

So he will reach at 3 PM ^{by adding 2 hr on starting time}

Reaching time = 3:00 PM

Question: 6(d)

I - STSTAICITS $\Rightarrow$ STATISTICS

II - LGEBMAR $\Rightarrow$ GEMBLAR

Question: 7(a)

Given data:

diameter of sphere = 14 cm

To find:

Volume of sphere = ?

Solution:

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

$$r = \frac{D}{2}$$

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

$$V = \frac{4}{3} \left(\frac{22}{7} \right) (7)^3$$
$$= \frac{4}{3} \left(\frac{22}{7} \right) (343) \text{ cm}^3$$

$$V = 1437.8 \text{ cm}^3$$

Question: 7(b)

Given data:

total savings = 25,000

ratio = 1 : 2 : 3 : 4 : 5

To find:

Smallest share = ?

Solution:

$$\text{sum of ratio} = 1+2+3+4+5 = 15$$

$$\text{Smallest share} = 1 \times \frac{5000}{15}$$

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

$$= 1666.66$$

$$\text{Smallest share} = 1666 \text{ Rs } 66 \text{ paise}$$

Question: 7(c)

i. 2, 6, 18, 54, 162, ... (number doesn't fit)

So the pattern is

$$2 \times 3 = 6$$

$$6 \times 3 = 18$$

$$18 \times 3 = 54$$

$$54 \times 3 = 162$$

$$162 \times 3 = 486$$

(None of the Numbers in this sequence are out of place)

ii - 3, 5, 7, 11, 13, ...

These are consecutive odd numbers

So, missing no = 17.

3, 5, 7, 11, 13, 17.

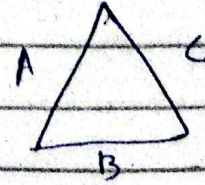
Question No. 7(d)

Given data: let

$$A = 5 \text{ cm},$$

$$B = 12 \text{ cm},$$

$$C = 13 \text{ cm},$$



To find:

angle = ?

Solution.

We need to check, if the given triangle is a right triangle

Pythagorean theorem

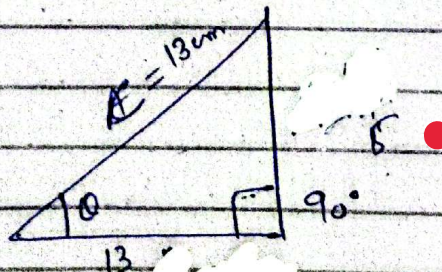
$$\text{Hyp}^2 = \text{Perp}^2 + \text{Base}^2 \Rightarrow C^2 = A^2 + B^2$$

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

$$169 = 144 + 25$$

$$169 = 169 \quad (\text{So } \angle C \text{ is right angle})$$

$\Rightarrow C$ is perpendicular, angle $C = 90^\circ$



$$\sin A = \frac{\text{Perp}}{\text{Hyp}} = \frac{5}{13} \Rightarrow$$

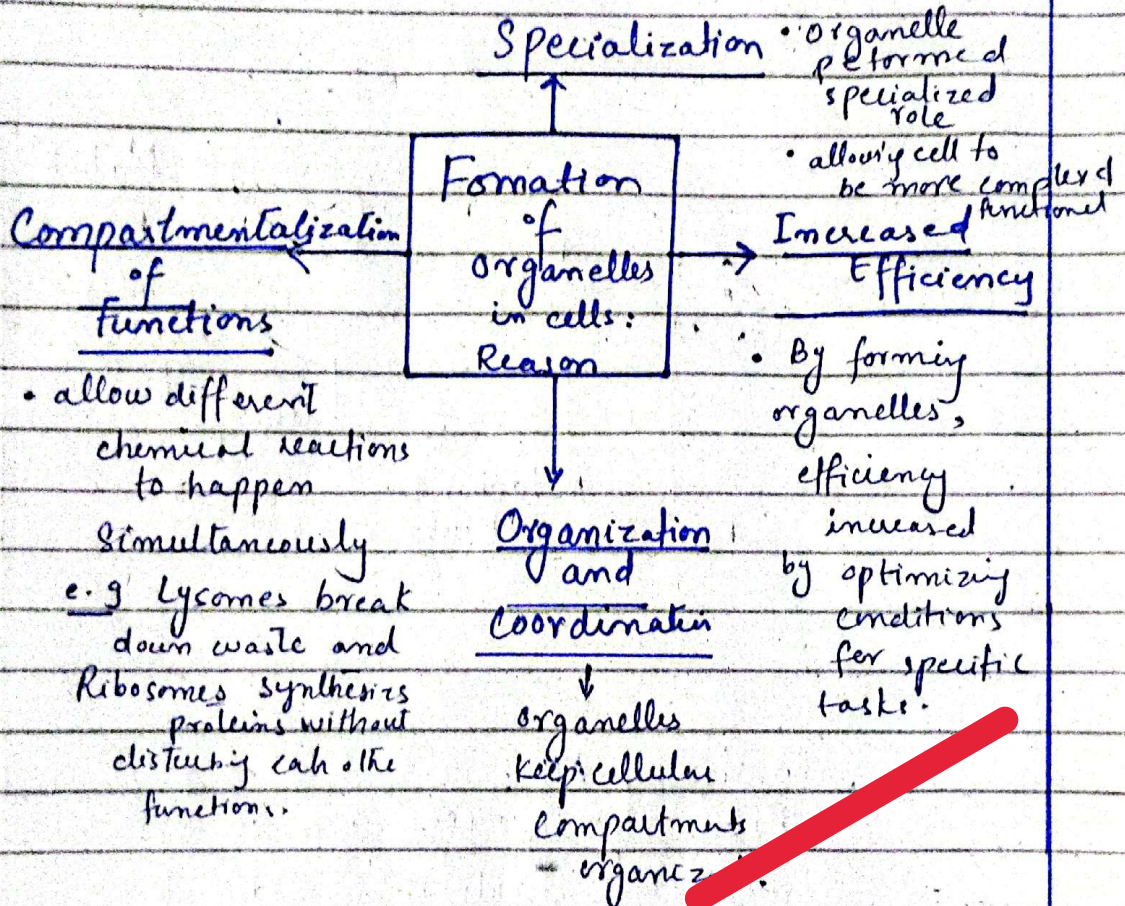
$$\angle_1 = \sin^{-1}(0.38)$$

$$\angle_2 = 90^\circ - \angle_1$$

$$= 90^\circ - \sin^{-1}(0.38)$$

Question No. 3(a)

REASONS FOR FORMATION OF ORGANELLES



Mitochondria

Mitochondria is the round-to oval-shaped organelle found in the cells of almost all eukaryotic cells.

Etymology:

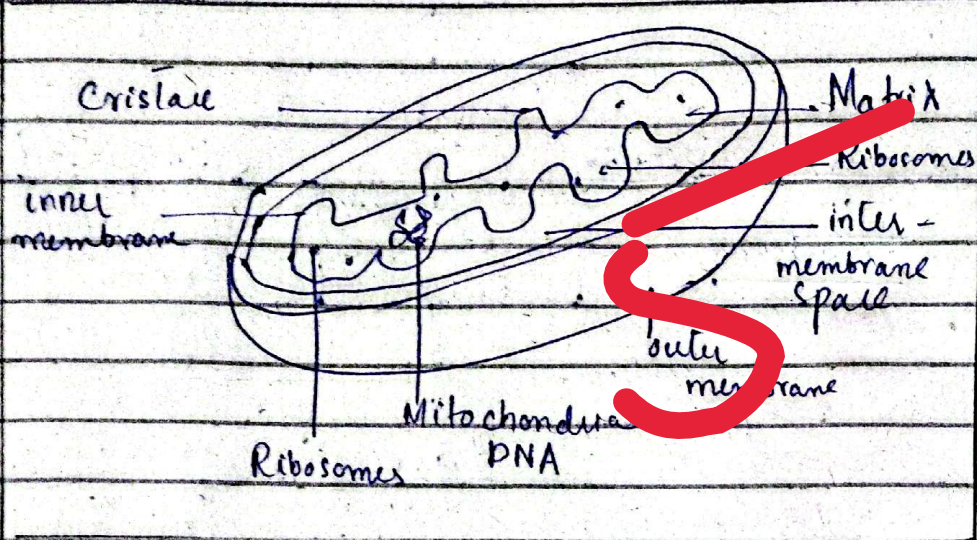
Greek words; mitos → thread
chondrion → granule

because thread or granular appearance under the microscope

Discovery:

Mitochondria was discovered by Albert Von Kelliker in 1857.

Structure:



Functions:

1) formation of ATP:

cellular respiration takes place in the mitochondria, that results in formation of ATP

2) Apoptosis.

Mitochondria initiates and regulates Apoptosis (programmed cell death)

3) Calcium storage.

Mitochondria regulates calcium concentration.

Question No. 3 (b)

DOPING:

Doping is the intentional introduction of impurities into pure semiconductors in order to modify its electrical conductivity.

Types of doping

- N-type Doping: → addition of elements with 5 valence electrons
- P-type Doping: → addition of elements with 3 valence electrons

SEMICONDUCTORS:

Types of semi-conductors

Intrinsic
Semi-conductor

Extrinsic
Semi-conductor

N-type

P-type

Intrinsic Semi-Conductors

Intrinsic semi-conductors are pure semi-conductors materials that are made from a single element or compound with no added impurities.

For example;

Silicon (Si)

germanium.

Extrinsic Semi-Conductors:

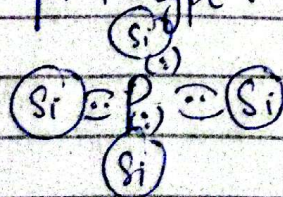
Extrinsic semiconductors are the semi-conductor materials that has been intentionally modified by adding a small amount of another element to a pure or intrinsic semi-conductor.

For example.

gallium Arsenide

Types

- N-type :- addition of Group V elements
- P-type :- addition of Group 3 elements



addition of N-type (pentavalent) impurity

Question No. 3 (c)

MERITS AND DEMERITS OF VOLCANIC ERUPTION

Volcanic Eruption is an eruption of molten rock, hot rock fragments, and gases through a volcano

(Britannica)

MERITS OF VOLCANIC ERUPTION

1. FERTILE SOIL

In the long run, the decomposition of nutrient rich volcanic fall out is responsible for ^{some of the world's best} fertile soil.

Example :

After eruption of Mount Toory (2002)

↓

Farmers observed that crops are growing far better than before. and they earn twice as before.

2. LAND FORMATION

The volcanic eruption results in different Land Formation

More than 80% of the earth's surface was originally created by volcanic activity.
(National geography)

3 - RAW MATERIALS :

Volcanic eruption results in bringing many raw materials from deep underground to earth surface. e.g.

Sulphur, Nickel,
gold, Copper,
aluminium, diamond,
ignite rock.

DEMERITS OF VOLCANIC ERUPTION

1 - LOSS OF PROPERTY AND LIFE :

Volcanic eruption results in loss of life and property.

e.g.;

Loss of Life | • Mount Tambora eruption
results in 90,000 deaths.

• Crater Lake in Cameroon,
results in 1700 deaths

Loss of Property | \$1 billion per year in
property damage. (Britannica)

2- ACID RAIN:

Volcanic eruption 'ash' dispersed by wind can block the sky for days. Toxic gases such as SO_2 react in the stratosphere. so acid rain can happen.

3. AVALANCHES, TSUNAMIS.

Volcanic eruption can cause avalanches, Tsunamis.

For example → tokyo eruption (2002)

↓
causes tsunami in Japan (NASA).

4. IMPACT ON ECONOMY:

Volcanic eruption have adverse effect on economy.

Cost of 1991 eruption of Mount Pinatubo

↓
\$7 billion.

Question No. 3(d)

DENGUE:

Dengue is a painful, mosquito born viral infection caused by dengue virus.

Cause:

- One of the four dengue viruses.

DEN VI

DEN V2

- Transmitted by several species of mosquito within the genus *Aedes* principally → *A. aegypti*

Symptoms:

- fever
- headache
- pain behind the eyes
- severe joint and muscle pain
- fatigue
- Nausea
- Vomiting
- rash.

Treatment.

- No specific anti-viral treatment against dengue
- take rest, plenty of fluids
- pain relievers