

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 per 5-mark part. Stick to this to avoid rushing later.
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. 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.

Hudaibia
 Balch #80

Date: _____

Section II

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

Q.6

a) Candy ratio problem

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

Asked: If Apple candies exceed Date candies by 35, how many Berry candies are there?

No: 6

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.

Formula: Let common factor = k . Apple = $3k$, Berry = $6k$, Cherry = $2k$, Date = $5k$.

So $5k - 3k = 35 \Rightarrow 2k = 35$.

Solution: $2k = 35 \Rightarrow k = 35 \div 2 = 17.5$

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.)

Solution:

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 $\div$ Speed.

Solution: Time = $36 \div 18 = 2$ 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 cm^3

Answer:

The volume of the sphere is approximately 1437.33 cm^3

Solution

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

Day: _____

Date: _____

original price = \$200

Discount = 25% of \$200

$$25\% \text{ of } 200 = \frac{25}{100} \times 200 = 50$$

Price after discount

$$200 - 50 = 150$$

Tax = 6% of \$150

$$6\% \text{ of } 150 = \frac{6}{100} \times 150 = 9$$

Total amount paid = $150 + 9 = 159$

Paid amount = \$159
(c)

Solution:-

Distance = 36 km

speed = 18 km/hr

$$\text{Time take} = \frac{\text{Distance}}{\text{speed}} = \frac{36}{18} = 2 \text{ hr}$$

Start time = 1:00 pm

$$1:00 \text{ pm} + 2 \text{ hr} = 3:00 \text{ pm}$$

so, the the bicycle reaches at
3:00 pm

(d)

ii) STSTAICITS

STSTAICITS

= STATISTICS

ii) LGEBMAR

LGEBMAR
= ALGEBRA

QNo: 7

(a)

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

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

Formula for volume of sphere:

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

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

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

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

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

$$\therefore 22 \times 49 = 1078$$

$$V = \frac{4 \times 1078}{3} = \frac{4312}{3}$$

$$V = 1437.03\text{cm}^3$$

(b)

Day: _____

Date: _____

Total saving = Rs 25000

Ratio = 1:2:3:4:5

Sum of ratio = $1+2+3+4+5=15$

Value of 1 Part = $\frac{25000}{15} = 1666.67$

So the smallest share (1 part) = 1666.67 Rs
(e)

i)

2, 6, 18, 54, 162, 486

$$2 \times 3 = 6$$

$$6 \times 3 = 18$$

$$18 \times 3 = 54$$

$$54 \times 3 = 162$$

$$162 \times 3 = 486$$

So, All numbers are correct and fit in the series.

ii)

3, 5, 7, 11, 13, —

$$3+2=5$$

$$5+2=7$$

$$7+4=11$$

$$11+2=13$$

$$13+4=17$$

3, 5, 7, 11, 13, 17

Day: _____

Date: _____

So the missing term is 17

(d)

$$a = 5\text{cm} \quad b = 12\text{cm} \quad c = 13\text{cm}$$

Using pythagoras theorem

$$c^2 = a^2 + b^2$$

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

$$169 = 25 + 144$$

$$169 = 169$$

right angle triangle is opposite to
longest side (13cm)

$$c = 90^\circ$$

$$\sin A = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{5}{13}$$

$$A = 22.62^\circ$$

$$B = 90^\circ - A$$

$$B = 90 - 22.62^\circ$$

$$B = 67.4^\circ$$

$$A = 22.62^\circ, \quad B = 67.4^\circ \quad C = 90^\circ$$

Section I

Q No: 4

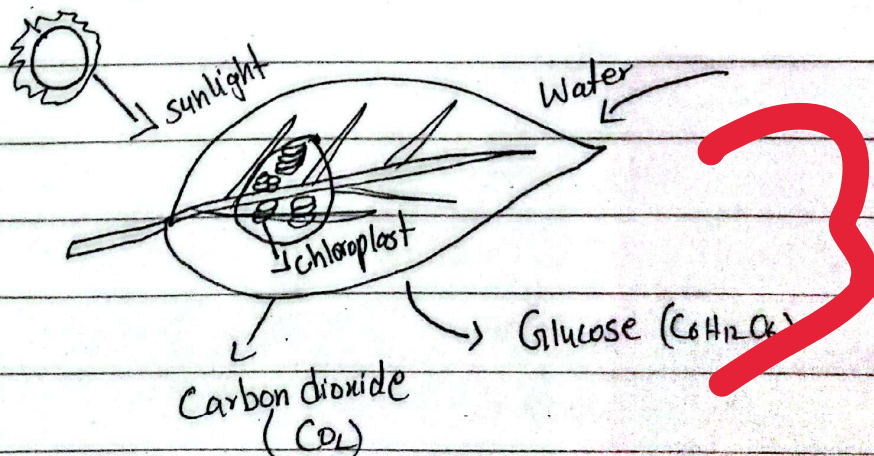
(a)

Chlorophyll

Day: _____

Date: _____

Chlorophyll is a green pigment located in the chloroplast of plants and certain algae. It is essential for photosynthesis, as it captures sunlight and converts it into chemical energy. Chlorophyll absorbs light mostly in the blue and red wavelengths and reflects green, giving plants their characteristic color. There are primarily chlorophyll a and chlorophyll b, which work together to maximize light absorption. It plays a crucial role in energy transfer during photosynthesis, enabling the synthesis of glucose and release of oxygen. Without chlorophyll, plants could not produce food, making it vital for all life on Earth.



(b)

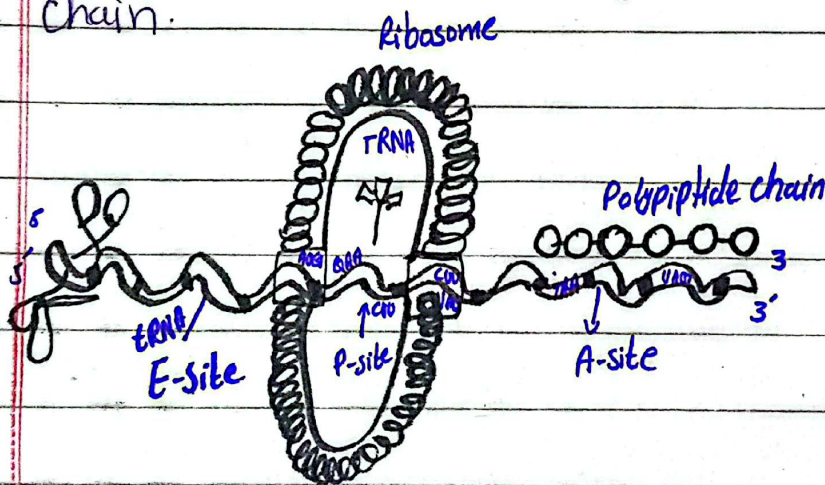
Role of ribosomes in Protein synthesis

The ribosome serves as the factory where the genetic code is translated into protein. It is a large, complex molecular machine composed of ribosomal RNA (rRNA) and proteins, existing in two subunits (small and large) that assemble on the mRNA template.

The core function of ribosome is the decoding of mRNA and the catalysis of peptide bond formation, ensuring the sequence of the amino acids in the growing polypeptide chain precisely matches ~~the~~ sequence of codons in the mRNA.

The ribosomes bind the mRNA and establish the reading frame, ensuring the codons (triplets of nucleotides) are read correctly, like aligning the correct starting point on a tape measure.

It provide three binding sites (A, P, E) for tRNA. The A site (aminoacyl-tRNA) accepts the incoming charged tRNA matching the codon. The P site (peptidyl-tRNA) holds the tRNA attached to the growing polypeptide, and the E site allows the uncharged tRNA to leave. The large subunit act as an enzyme to form the peptide bond between the amino acids, linking the growing chain.



(C)

Methods of Solid Waste Management

Solid waste management (SWM) involves set of activities designed to manage waste from its inception

to its final disposal. The most effective approach is often guided by the waste management Hierarchy, which priorities actions from most to least environmental preferred.

Methods

The primary methods used for the treating and disposing of solid waste can be grouped as:

1- Resource Management

These methods aim to decrease the volume of waste generated ~~and~~ incorporate materials back into the production cycle.

1- Reduction is used to minimize the amount of waste created at the source using less packaging.

2- Reuse items multiple times without significant reprocessing like refilling of water bottles.

3. Recycling of paper, glass and plastic into new products.

2- Biological treatment Method

These methods use microorganisms

to decompose organic waste.

A controlled process where organic matter decomposes in the presence of oxygen, resulting in a nutrient-rich soil conditioner called compost.

The decomposition of organic matter in a sealed container in the absence of oxygen, and the ~~anaerobic~~ ²composting.

3- Thermal Treatment Methods

These methods involve the use of heat to convert waste into ash, gas, or heat energy, significantly reducing its volume. Likewise, incineration, pyrolysis and gasification.

4- Disposal Methods

These are generally the least preferred options in the waste hierarchy, used for residual waste that cannot be practically treated by other methods, likewise sanitary landfilling, and controlled dumping.

(d)

1- Biofuel

A fuel ~~derived~~ derived

From biomass (living or dead plants material or animal waste) as opposed to Fossil fuel. Common examples include ethanol (from corn, sugar cane) and biodiesel from vegetable oils, and animal fats. They are a source of renewable energy.

2- Adulteration

The act of debasing a substance like food, fuel or a chemical by adding inferior, cheap or improper foreign substances in the content of fuels, it often refers to mixing in lower quality or harmful materials.

3- Troposphere

The lowest layer of the Earth's atmosphere, extending from the ground up to about 10-20km. It is where humans live and nearly all weather occurs within this layer, as it contains about 99% of the atmosphere's water vapor.

5- Isotopes

Varients of a particular chemical element that have the same number of protons and thus the same atomic number and chemical properties but a different number of neutrons and thus different atomic masses. For example, Carbon-12 and carbon-14 are isotopes of carbon.