

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

Hi there, you've done well. Know that acquiring knowledge is one thing and reproducing it in paper according to what's asked is another. There are a few things I would like to highlight.

1. A 5 mark part requires at least 2 and at max 3 sides of a paper. Know that there can be two or three parts of a question and their marks are divided accordingly. So, address all of them in a just manner.

2. Focus on time management. You get 35 minutes to solve one question and about 8 minutes per 5 mark part. Manage your time accordingly.

3. You need to understand that your paper is supposed to look more scientific than theoretical. So, add flowcharts and diagrams where required.

4. Your handwriting and neatness can be really impactful. Avoid cutting and overwriting.

5. Focus on your spellings and your grammar. Here, in GSA there's no deduction in marks but your expression will definitely create an impact.

6. In ability portion, give explanation for analytical ability question in words. You need to understand that a 5 mark part requires all steps written and explained.

Good luck for CSS 2025. You're gonna rock in sha Allah. :)



It implies that;

$$x = z + 50$$

put it in eq ii)

$$3(z + 50) = 4z$$

$$3z + 150 = 4z$$

$$150 = 4z - 3z$$

$$150 = z$$

using symmetry property  
of equality

$$z = 150$$

Rewrite the eq i)

$$x : y : z : k = 4 : 7 : 3 : 1$$

Consider the ratio of  $y$  and  
 $z$  only

write in fractions

$$\frac{y}{z} = \frac{7}{3}$$

Apply cross multiplication

Substitute  $z = 150$  into the  
equation

$$3y = 7(150)$$

$$y = \frac{7(150)}{3}$$

$$y = \frac{7(50)}{3}$$
$$y = 350$$

The number of 'B' blocks is 350.

b.

Find the sales tax.

The original price is 80\$ while the sales tax is 10%.

10% of 80 is given by:

$$10\% \times 80$$
$$= \frac{10}{100} \times 80$$
$$= 8$$

The sales tax is 8\$.

Find the Discount

The original price is 80\$ while there is 15% discount.

15% of 80 is given by

$$15\% \times 80$$
$$= \frac{15}{100} \times 80$$



$$= \frac{15 \times 8}{10}$$
$$= 12$$

There will be discount of 12 \$.

Final Price  
Note that discount will be subtracted and sales tax will be added to the original price.

The final price will be:

$$80 - 12 + 8$$
$$= 76$$

The final price will be 76 \$.

c.

Find the time-taken by the train.

The formula for speed is given by.

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

where  $s$  is the speed,  $d$  is



The distance and  $t$  is the time.

$$s = \frac{d}{t}$$

Substitute  $s = 36$  and  $d = 42$  into the equation

$$36 = \frac{42}{t}$$

$$t = \frac{42}{36}$$

$$t = \frac{7}{6}$$

$$t = 1.1666\dots$$

$$t \approx 1.167$$

$$\begin{array}{r} 1.16 \\ - 6 \\ \hline 10 \\ - 6 \\ \hline 40 \\ 36 \\ \hline 4 \end{array}$$

The time taken by the train is 1.167 hours.

Convert the time to a combination of hours and minutes.

Note that 1 ~~hours~~ hour has 60 minutes.

1.67 hours can be written as

$$\begin{aligned} & 1.67 \text{ hours} \\ &= 1 \text{ hours } (0.67 \times 60) \text{ minutes} \\ &= 1 \text{ hours } (1.67 \times 6) \text{ minutes} \end{aligned}$$

$$\begin{array}{r} \overset{4}{.} \overset{4}{.} \\ 1.67 \\ \times 6 \\ \hline 10.02 \\ = 10.02 \end{array}$$

$$= 1 \text{ hours } 10 \text{ minutes}$$

If train starts at 4 pm,  
after 1 hours and 10 minutes,  
when it reaches its spot,  
the time will be

5:10 pm.



d

i - teninsuperted  
ii - hweti

ii - The correct word for  
hweti will be  
"white"

i - The correct word for  
teninsuperted will be  
"

Q No. 7

Q.

Formula for volume of cylinder:

$$V = \pi r^2 h$$

where  $V$  is the volume,  $r$   
is the radius and  $h$  is the  
height of the cylinder.

$$V = \pi r^2 h$$

Substitute  $r = 30$  and height  $h = 1$  into the equation.

$$V = \pi (30)^2 (1)$$

let  $\pi \approx 3.14$ .

$$27. \quad V = 3.14 (30)^2 (1)$$

$$V = 3.14 (900)$$

$$V = 314 (1)$$

$$V = 2826$$

The volume of the cylinder is about 2826

The height of the cylinder is

$$h = 1 \text{ m}$$

Note that there are 100 cm in 1 m.

Convert the unit to cm by multiplying the number by 100



$$h = 1 \times 100 \text{ cm}$$

$$h = 100 \text{ cm}$$

Formula for volume of radius cylinder:

$$V = \pi r^2 h$$

Substitute  $r = 30$  and  $h = 100$  into the equation

$$V = \pi (30)^2 (100)$$

let  $\pi \approx 3.14$

$$\Rightarrow V = 3.14 (30)^2 (100)$$

$$V = 3.14 (900) (100)$$

$$V = 3.14 (90000)$$

$$V = 314 (900)$$

$$V = 282600$$

The volume of the cylinder is about 282600 cm<sup>3</sup>.

b

Let the age of boys from youngest to oldest be  $a, b$  and  $c$  respectively.

Average of ages

Average is defined as sum of all elements divided by the number of elements.

The average of ages which are  $a, b$  and  $c$  is given by:

$$\frac{a+b+c}{3}$$

Note that the average of ages is 15 years.

Equate the expression for average of ages against 15

$$\frac{a+b+c}{3} = 15$$

$$a+b+c = 15 \times 3$$

$$a+b+c = 45 \quad \text{eq i)}$$



Ratio of the ages of boys.

The ratio of ages of boys is given by

$$3:5:7$$

It implies that

$$a:b:c = 3:5:7$$

The ratio of only 'a' and 'b' is given by:

$$a:b = 3:5$$

Write the ratio in fractions:

$$\frac{a}{b} = \frac{3}{5}$$

Apply the cross multiplication.

$$\begin{array}{l} 5a = 3b \\ \hline b = \frac{5a}{3} \end{array}$$

Similarly,

The ratio of only 'a' and 'c' is given by

$$a:c = 3:7$$

Write the ratio in fractions

$$\frac{a}{c} = \frac{3}{7}$$

Apply cross multiplications.

$$7a = 3c$$

$$c = \frac{7a}{3}$$

Putting the values of  $c$  and  $b$  in eq i)

$$a + b + c = 45$$

$$a + \frac{5a}{3} + \frac{7a}{3} = 45$$

Multiply each term by 3

$$3a + 5a + 7a = 135$$

$$15a = 135$$

$$a = \frac{135}{15}$$

$$a = \frac{27}{3}$$

$$a = 9$$

The age of the youngest boy is 9 years.



d.

The sides of the triangle are  
5, 4, 6.

Triangle is not equilateral or  
isosceles as all sides are different.

check if the triangle is  
right-triangle

Suppose that the given triangle  
is a right-triangle.

Note that in a right triangle,  
the hypotenuse is always greater  
than the individual legs.

In the given scenario,  
the hypotenuse will be 6  
and legs will be 5 and 4.

The right-triangle follows the  
Pythagorean theorem.

The Pythagorean Theorem is given  
by

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

where  $a$  and  $b$  are the legs  
and  $c$  is the hypotenuse.

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

Substitute  $a=4$ ,  $b=5$  and  $c=6$  into the equation:

$$4^2 + 5^2 = 6^2$$

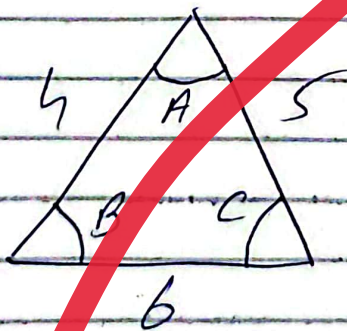
$$16 + 25 = 36$$

$$41 = 36$$

which is not true.

The given triangle is ~~not~~ not a right triangle.

let the angles of the triangles be  $A$ ,  $B$  and  $C$  as shown in the triangle:



By Note the ratio of sides of triangle is equal to ratio of its angle.



The ratio of sides is:  
 $4:5:6$

The ratio of corresponding angles will be  
 ~~$A:B:C$~~   
 $C:B:A$

It implies that  
 $C:B:A = 4:5:6$

The ratio of only C and B  
is given by

~~$C:B = 4:5$   
 $\frac{C}{B} = \frac{4}{5}$   
 $B = \frac{5}{4} C$~~

The ratio of only 'C' and 'A'  
is given by

$$C:A = 4:6$$
$$\frac{C}{A} = \frac{4}{6}$$

$$A = \frac{6}{4} C$$

Recall that in a triangle,

the sum of interior angles  
is  $180^\circ$

$$A + B + C = 180$$

put  $A = \frac{6}{4}C$  and  $B = \frac{5}{4}C$

into the equation:

$$\frac{6C}{4} + \frac{5C}{4} + C = 180$$

$6C + 5C + 4C = 180 \times 4$   
(multiplying each term by '4')

$$15C = 180 \times 4$$

$$C = \frac{180 \times 4}{15}$$

$$C = 12 \times 4$$

$$C = 48^\circ$$

$$A = \frac{6}{4}C$$

put  $C = 48^\circ$

$$A = \frac{6}{4}(48)$$

$$A = 72^\circ$$



$$B = \frac{5}{4} C$$

Put  $C = 48^\circ$

$$B = \frac{5}{4} (48)$$

$$B = 60^\circ$$

The angles of the triangle is  $48^\circ$ ,  $60^\circ$  and  $72^\circ$ .

Q.

i - 8, 19, 52, 151, 447, -

The difference between the consecutive terms is:

$$19 - 8, 52 - 19, 151 - 52, 447 - 151$$
$$11, 33, 99, 296$$

Notice that 11, 33, 99 are such that:

$$11 \times 3 = 33$$

$$33 \times 3 = 99$$

But:

$$99 \times 3 = 297$$

while the numbers in series of differences of consecutive terms are, 11, 33, 99, 296.

The last term must be  
297 instead of 296.

For the last term to be  
~~297~~, 151 should be

~~151~~  
subtracted from 448 instead  
of 447.

8, 19, 52, 151, 447, —

The wrong number in this  
series is '447' it must  
be 448.

The correct sequence will be:  
8, 19, 52, 151, 448, —

In this case, let the last  
number be  $x$ .

The difference between  $x$  and  
448 will be,  $297 \times 3$

$$297 \times 3 = 448 + x$$

$$-x = -448 - 297 \times 3$$

$$x = 448 + 297 \times 3$$

$$x = 448 + 891$$

$$x = 1339$$



The last missing term  
is 1339

ii -

11, 13, 17, 19, 23, -

The difference between  
consecutive terms is

$13 - 11, 17 - 13, 19 - 17, 23 - 19$   
 $2, 4, 2, 4$

Note note that a sequence with  
alternating '2' and '4'.

The next term in the sequence  
 $2, 4, 2, 4$   
will be '2'.

11, 13, 17, 19, 23, -

let the last missing term  
be  $x$

It implies that

11, 13, 17, 19, 23,  $x$

The difference between  $x$   
and 23 will be 2.

$$x - 23 = 2$$

$$x = 2 + 23$$

$$n = 25$$

The last missing term is 25.

Q. 3

a.

Chemical bonds in atom.

All the atoms form chemical bonds in order to stabilize themselves.

Atoms have electrons revolving around its nucleus in orbits.

The number of valence electrons in the valence shell determine the stability of the atom.

Atoms follow 2 rule to stabilize themselves.

i - Octet rule

ii - Duplet rule.



## i- Octet rule

Octet rule states that the number of electrons in the valence shell of the atom must be 8.

If the atom has more than 8 electrons in its valence shell, it loses electrons and if it has less than 8 electrons it gains the electrons.

For example.

$\text{Na}^+ \text{Cl}^-$   
Na has 9 electrons in its valence shell, it loses 1 electron.  
Cl has 7 electrons in its valence shell, it gain 1 electron.

This transfer of electron makes the chemical bond.

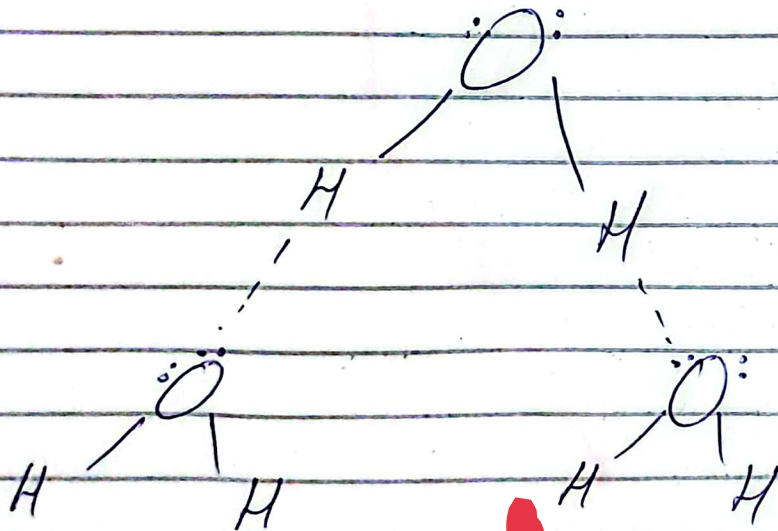
## ii- Duplet rule

like wise, octet duplet rule states that the number of electrons in the valence shell of the atom must be 2.

## Covalent bond in water

The elect elements in the water molecule are hydrogen and oxygen.

The general formula is  $H_2O$ .



Note that both hydrogen and oxygen are non-metal, so they share electrons to stabilize themselves.

Oxygen has 6 electrons in its valence shell and each hydrogen has 1 electron in its valence shell.



Oxygen shares 2 electrons, one with each hydrogen atom to stabilize itself.

Similarly, by completing 8 electrons in its valence shell (octet rule)

Hydrogen has 1 electron in its valence shell, so it shares 1 electron with oxygen to have a total of 2 electrons in its valence shell (duplet rule)

b

Doping is addition of impurities in semiconductors. Doping changes the concentration of elements in a semiconductor and make it positively or negatively charged.

## C. Global Warming

The rise of the average temperature of the earth is called global warming.

### Reasons of Global Warming

The main reason for the global warming is the emission of green house gases.

Green house gases are as follow:

- i - chlorofluro carbon
- ii - Hydro fluro carbon
- iii - flurofluro carbon
- iv - Ozone ( $O_3$ )
- v - Carbon dioxide
- vi - Methane

This gases makes a green house around the earth which allows the inflow



of heat from sun but block the outflow of the heat emitted by earth. Simply, it trap the heat and rises the temperature

Demerits of Global warming  
Global warming has the following consequences:

i - Glaciers melt at faster rate which affect the biodiversity and rises the water level in the rivers that will cause flood

ii - Flood, caused by melting glaciers, causes soil erosion and can destroy the landscape of an area.

iii - Global warming can affect the water cycle by changing the amount of rainfall, snowfall and hails.

Merits of Global warming

There're no merit of global warming. Although



There are some part of earth which are inhabitable due to extreme cold weather, can become habitable

For Example:

Some areas of North America, Russia and Antarctica

Note that Pakistan is most vulnerable to global warming. The average temperature of earth is increasing by  $0.2^{\circ}\text{C}$  per decade ~~year~~ in the last decade but the average temperature of Pakistan is rising by  $0.5^{\circ}\text{C}$  in the last decade.

d. Polio

Polio is a virus spread by a specific kind of fungi. Polio virus makes a person physically disable. There are vaccines which can prevent polio



## Challenges in Polio eradication in Pakistan

### i - Lack of education

The literacy rate in Pakistan is about 62.3%. It means a large population of Pakistan is illiterate. Due to lack of education, some Pakistani people consider polio vaccine as injurious to health. They think this vaccine can make a man infertile. They try to avoid polio vaccine and become susceptible to polio virus.

### ii - Terrorism

Terrorism is one of the leading hurdles in polio eradication. Terrorists target the polio vaccination team, attack on them, try to kill them. Due to terrorist attacks, Pakistan is unable to vaccinate the children against polio.



Q. No. 2

C

Balanced diet

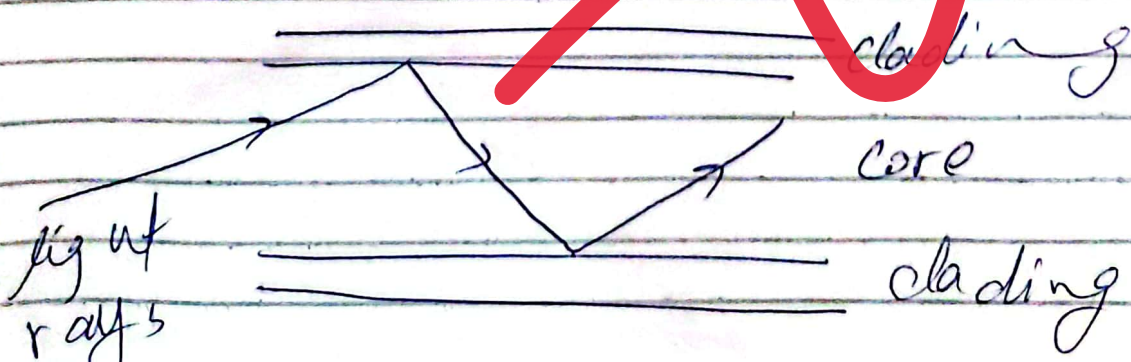
Balanced diet means to eat a specific amount of all kinds of vegetable fruits, cereals and meat to keep all the body functions normal.

Balanced diet basically means eating foods containing to get vitamins, proteins, fats and other all types of nutrients.

d.

Optic fibre

Optic fibres are the new technology which uses light rays to transfer data through a glass fibre. It uses refraction within the glass fiber to transmit the light rays.



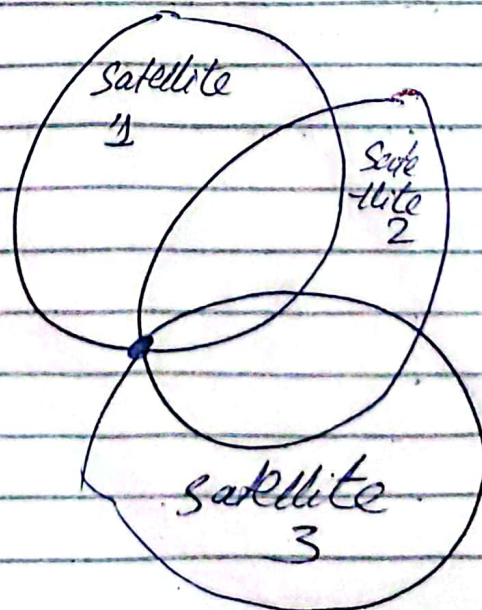


Now-a-days all the internet companies uses optical fibres for internet provision.

### GPS

GPS stands for Global Positioning System. It is a system of 24 working satellites which is used to determine the exact position of a person, thing or any other object on the earth.

At a time, 3 GPS satellites are used to determine the position of an object on earth.





a.

In today's technological world, electricity is required to run all the machines, industries and factories.

Artificial intelligence is spreading at such a fast pace that every industry is integrating AI in its operations.

Soon, AI will be an inseparable part of every type of industries.

AI has been integrated in weapons, teaching, robotics and cinematography as many more. Soon we will see AI doing a large portion of work in every sector.

So, AI is the new electricity needed to run the industries, factories and machineries.

b.

We give command to CPU and it performs that operation likewise brain also perform operation on human body.