

Dos and Don'ts for General Science & Ability Paper

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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 marks 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 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. :)

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serotypes (DENV-1, DENV-2, DENV-3, and DENV-4), it is caused by *Aedes aegypti*. A person infected with one serotype may become immune to it, but can still be infected by other serotypes.

Symptoms:

Give early, critical, recovery symptoms

→ Following are the symptoms of Dengue virus;

1. Fever,
2. Severe headache,
3. Pain behind the eyes,
4. Joint and muscle pain,
5. Rash, and mild bleeding, etc.

(b)

Dark Matter:

→ Dark matter is an unknown form of matter that makes up about 27% of the universe. It does not emit, absorb, or reflect light, making it invisible. Its presence is inferred

from its gravitational effects on visible matter, radiation, and the structure of the universe.

Dark Energy:

→ Dark energy is a mysterious force driving the accelerated expansion of the universe, accounting for about 68% of the cosmos. Unlike dark matter, which clusters, dark energy appears to have a uniform density, affecting space's fundamental structure.

(d)

Covalent Bonds:

→ Covalent bonds are formed when;

☞ Atoms share electron pair to achieve stability. ☞



Types:

→ Following are the three types of covalent bonds;

(1) Single Covalent Bond:

→ Single covalent bond is formed when atoms share one pair of electrons.

Example:

→ For example, hydrogen (H₂)

Structure:



(2) Double Covalent Bond:

→ Double covalent bond is formed when atoms share two electron pairs.

Example:

→ For example, Oxygen (O₂)

Structure:



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(3) Triple Covalent Bond:

→ Triple covalent bond is formed when atoms share three electron pairs.

Example:

→ For example, nitrogen (N_2).

Structure:

N_2



(C)

Structure of Mitochondria:

→ Mitochondria has a double membrane, the outer is smooth, while the inner membrane is folded into structures called cristae, which increases the surface area for energy production.

Figure:

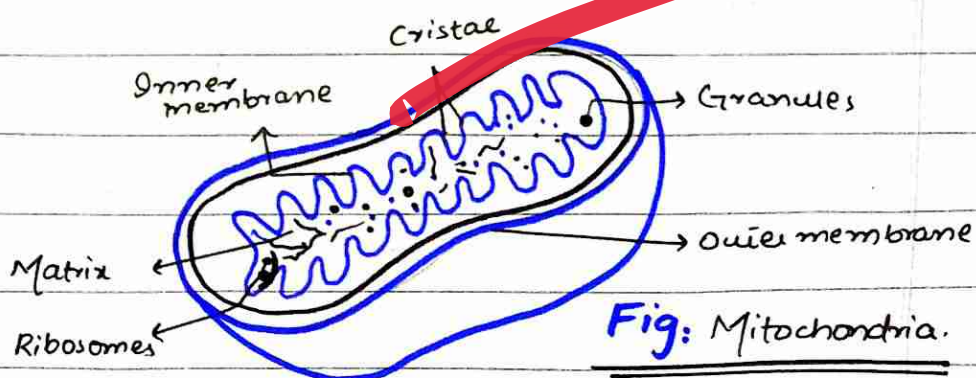


Fig: Mitochondria.

Function of Mitochondria:

→ Mitochondria are responsible for;

1. Cellular respiration,
2. Energy production,
3. Produce Adenosine Triphosphate (ATP),
the cell's main energy carrier, through
oxidative phosphorylation.

Powerhouse Role:

→ They are termed as the "powerhouse of cell" because they convert glucose and oxygen into energy (ATP), essential for cellular functions.

Q.No.3

(a)

Lunar Eclipse:

→ A lunar eclipse occurs when;

“Earth comes between the
sun and the moon, causing
earth's shadow to fall on the
moon.”

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Types:

→ There are three types of lunar eclipse;

1. total,
2. partial,
3. Penumbral.

Diagram:

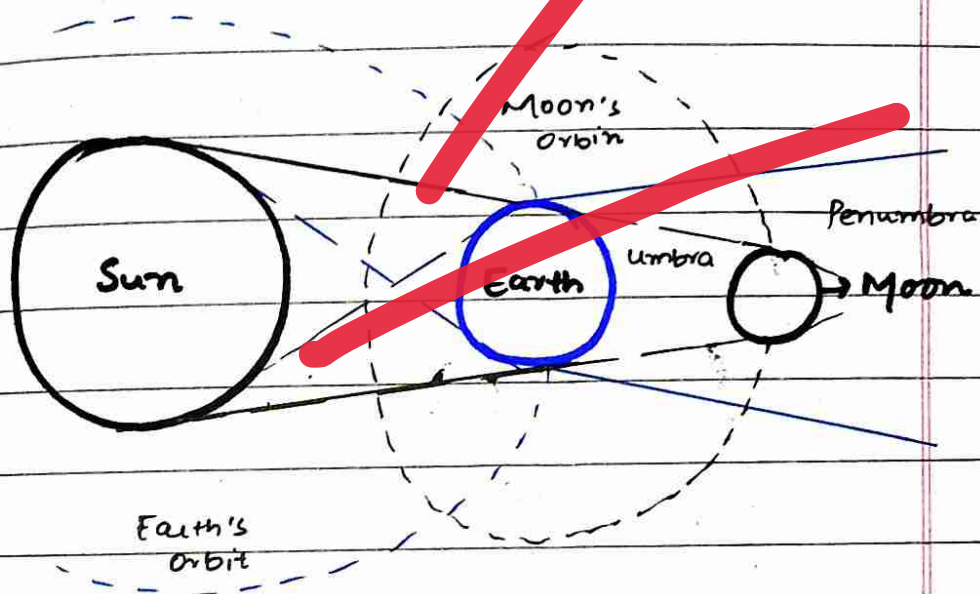


Fig: Lunar Eclipse

(b)

Enzyme:

→ Enzymes are

Biological catalysts that speed up chemical reactions in living organisms.



Function:

→ Enzymes lower the activation energy required for chemical reaction.

Example:

→ Amylase breaks down starch into sugars and lipase helps digest fats.

(d)

Earthquakes and Volcanic

Eruptions are interconnected.

→ Yes, earthquakes and volcanic eruptions are interconnected as both result from tectonic plate movements. Earthquakes can occur due to volcanic eruptions, moreover, shifting plates can lead to both earthquakes and volcanic eruptions. Therefore, both are caused by heat and energy released by earth's core.

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(C)

Brief account of Electromagnetic Radiations (EMR):

→ EMR consists of;

“Waves of electric and magnetic fields that travel through space.”

→ EMR is, therefore, a stream of mass-less particles, called photons, each travelling in a wave-like pattern at the speed of light.

- NASA

Figure:

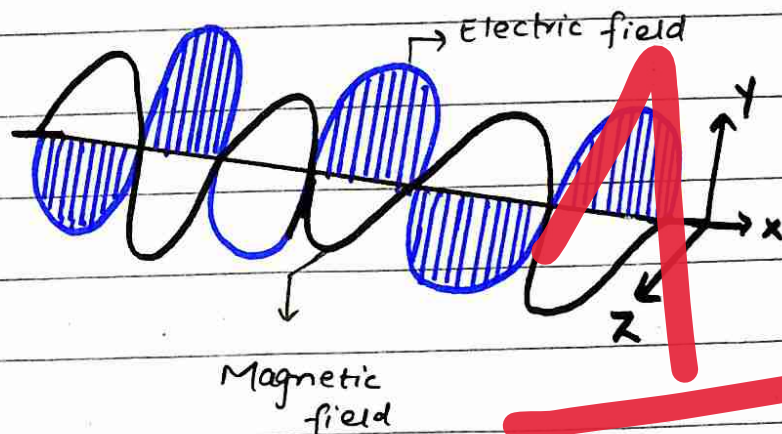


Fig: Electromagnetic Radiations
(EMR)

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EMR Spectrum:

→ EMR spectrum ranges from low energy radio waves to high energy gamma rays, including microwaves, infrared, visible light, ultraviolet, X-rays and gamma rays.

SECTION-II

Q.NO-6

(a)

Determine the "K" value - is 15.

Solution:

As,

$$\text{Arithmetic Mean} = \frac{9+8+10+K+12}{5} = 15$$

Solving for "K" value;

$$39 + K = 15(5)$$

$$K = 75 - 39$$

$$K = 36$$

(b)

A mixture ----- given mixture.

Solution:

Let, the initial quantities be;

$$\text{Sugar} = 4x$$

$$\text{Colored water} = 3x$$

After adding 10 l of colored water;

$$4x : 3x + 10 = 4 : 5$$

$$\frac{4x}{3x + 10} = \frac{4}{5}$$

$$20x = 4(3x + 10)$$

$$20x = 12x + 40$$

$$20x - 12x = 40$$

$$8x = 40$$

$$x = \frac{40}{8}$$

$$x = 5$$

Putting $x = 5$, for initial quantity of sugar solution;

$$\text{Sugar} = 4(5)$$

$$\text{Sugar} = 20 \text{ l}$$

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(c)What will be 12cm.Solution:

As,

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

$$\therefore r = 12 \text{ cm}$$

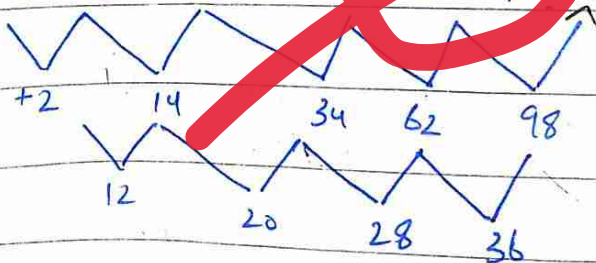
$$V = \frac{4}{3} \left(\frac{22}{7} \right) (12)^3$$

$$V = \frac{88}{21} (1728)$$

$$V = 7216.47 \text{ cm}^3$$

(d)-10, -8, -6, 40, 102, ?Find the number:Solution:

-10, -8, -6, 40, 102, ? 200



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→ Therefore, the missing number is 200.

Q. NO. 7

(a)

If 20% - - - - - of x?

Solution:

Given that;

$$20\% \text{ of } x = y$$

So,

$$\frac{20}{100} \times x = y$$

$$20x = 100y$$

$$x = \frac{100}{20} y$$

$$\boxed{x = 5y}$$

For y% of 20;

$$\frac{y}{100} \times 20 = \frac{y}{5}$$



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Putting $x = 5y \Rightarrow y = \frac{x}{5}$

$y\% \text{ of } 20 = \frac{y}{5} = \frac{x/5}{5}$

$y\% \text{ of } 20 = \frac{x}{25}$

$\Rightarrow$ Therefore, $y\%$ of 20 in terms of x is $\frac{x}{25}$.

(C)

Two coins - - - - - to occur.

Solution:

Total trials = 500 times,

Two heads:

$P(\text{Two heads}) = \frac{105}{500}$

$P(\text{Two head}) = 0.21$

One head:

$P(\text{one head}) = \frac{275}{500}$

$P(\text{one head}) = 0.55$

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No head:

$$P_{(\text{no head})} = \frac{120}{500}$$

$$P_{(\text{no head})} = 0.24$$

(b)

P and Q ----- of P?

Solution:

Given that,

$$\frac{P+Q}{2} = 5050 = 10100 \quad - \text{a)}$$

$$\frac{Q+R}{2} = 6250 = 12500 \quad - \text{ai)}$$

$$\frac{P+R}{2} = 5200 = 10400 \quad - \text{cii)}$$

Adding all three equations;

$$(P+Q) + (Q+R) + (P+R) = 10100 + 12500 + 10400$$

$$2P + 2Q + 2R = 33000$$

$$2(P+Q+R) = 33000$$

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$$\frac{P+Q+R}{2} = \frac{33000}{2}$$

$$P+Q+R = 16500$$

Putting $Q = 10100 - P$ and $R = 10400 - P$
from (i) and (ii);

$$P + (10100 - P) + (10400 - P) = 16500$$

$$P - 2P + 20500 = 16500$$

$$-P = 16500 - 20500$$

$$+P = +4600$$

$$\boxed{P = 4600}$$

(d)

Jame's dad - - - - - age now?

Solution:

Let,

Jamie's age = x

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$$\text{Jamie's dad's age} = 4x$$

In 14 years;

$$\text{Jamie's age} = x + 14$$

$$\text{Dad's age} = 4x + 14$$

Given;

$$4x + 14 = 2(x + 14)$$

$$4x + 14 = 2x + 28$$

$$4x - 2x = 28 - 14$$

$$2x = 14$$

$$\boxed{x = 7}$$

→ So, Jamie's current age is 7. And his dad's age is $4 \times 7 = 28$.

→ Sum of their ages;

$$\boxed{7 + 28 = 35}$$