

Dos and Don'ts for General Science & Ability Paper

1

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 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. :)

M#4
General Science and Ability

Sec#1

Q#2

(a)

Malnutrition

Malnutrition is a health condition that arises when nutrition is deficient in body. It occurs when a person does not consume enough essential nutrients.

2 Main Types

Undernutrition

- Undernutrition is when a person is deprived of protein, micronutrients or calories leading to stunted growth, low weight and height.

Overnutrition

- Overconsumption of certain nutrients like fat, protein or calories can lead to overnutrition resulting in obesity, diabetes or stroke.

Causes of Malnutrition

Direct Causes



- Inadequate food intake
- Gastro-intestinal diseases
- Alcoholism
- Mental health disorders
- Poor diet quality

Indirect causes



- Poverty
- Food insecurity
- Conflict and displacement
- Climate change
- Healthcare access

Consequences of malnutrition

Physical

- Weight loss
- Low energy
- Muscle wasting
- Increased risk of fractures
- Reduced mobility

Physiological

- Increased risk of infection
- Prolonged period of recovery
- Increased risk of side effects
- Reduced quality of life
- Memory loss

- (b) -

Food Contamination

Definition

1- The presence of harmful substances in food that render it unfit for consumption is termed as food contamination.

Causes

2- Accidental or unintentional introduction of contaminants

Nature of substances

3- Can include micro-organisms (bacteria, viruses, parasites), chemicals or physical objects (glass metal)

Health Risks

4- Can lead to foodborne illnesses, such as food poisoning, diarrhoea or vomiting

Food adulteration

1- The intentional addition of inferior or foreign substances to food to increase its weight, appearance or volume, while deceiving consumers is termed as food adulteration.

2- Deliberate and fraudulent actions

3- Often involved the addition of cheaper ingredients or artificial substances

4- May pose health risks if added substances are harmful or if

Example

5- Food contaminated with E. coli bacteria or toxins.

Detection

6- Can be detected through laboratory testing and food safety inspections.

Prevention

Pre

7- Proper food handling, storage and preparation practices can prevent food contamination.

they mask the presence of harmful contaminants.

5- Addition of water or fillers to milk, meat or juice.

6- Difficult to detect because without specialized testing or knowledge of the adulterants.

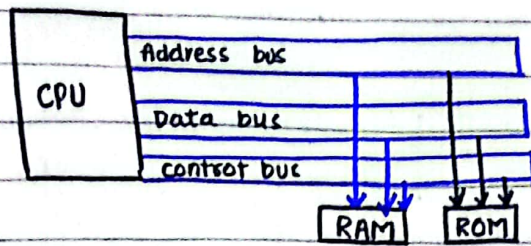
7- Strict regulatory controls and enforcement are necessary to prevent adulteration.

- (C) -

Computer buses

These are the electrical wires through which CPU communicates with other parts of computer.

→ Early PCs had single external bus or system bus.



Structure of computer bus

Difference between

RAM

Definition

- RAM can be defined as temporary memory that can hold data and instructions if there is adequate power supply.

Type

- The content in RAM (Random Access Memory) can be accessed and processed.

Utility

- It stores immediate instructions required by the processor.

ROM

- ROM can be defined as permanent memory that can hold the data even power is switched off.

- The content in ROM (Read Only Memory) can not be processed. It can only be read.

- It keeps the bootstrap instructions of a computer.

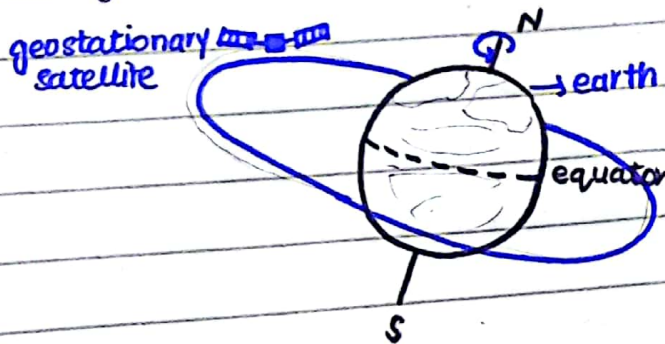
- (d) -

Geo-stationary satellite

A geo-stationary satellite is an earth orbiting satellite and placed directly over the equator. It revolves in the same direction the earth rotates and takes 24 hours to complete one rotation.

Use:

A geo-stationary satellite is used in direct broadcast TV, communication network or global positioning system



Natural satellite

The satellite which revolve naturally are called natural satellites.

e.g: Moon is a natural satellite of earth

2- Artificial satellite

These are man-made satellites that revolve around a planet particularly earth.

2 Types

Geo-stationary

* Their motion is synchronized with the motion of earth.

Polar satellites

These satellites move from north pole to the south pole

3- Artificial satellites of Jupiter

There are no artificial satellites of Jupiter.

3

Q#5

(a)

Radioactivity

Radioactivity is defined as;

Radioactivity is the spontaneous emission of energy and subatomic particles from an unstable atomic nuclei.

Radioactive decay:

The process of radioactivity is called radioactive decay

Radiations:

The energy emitted and particles collectively referred to as radioactivity.

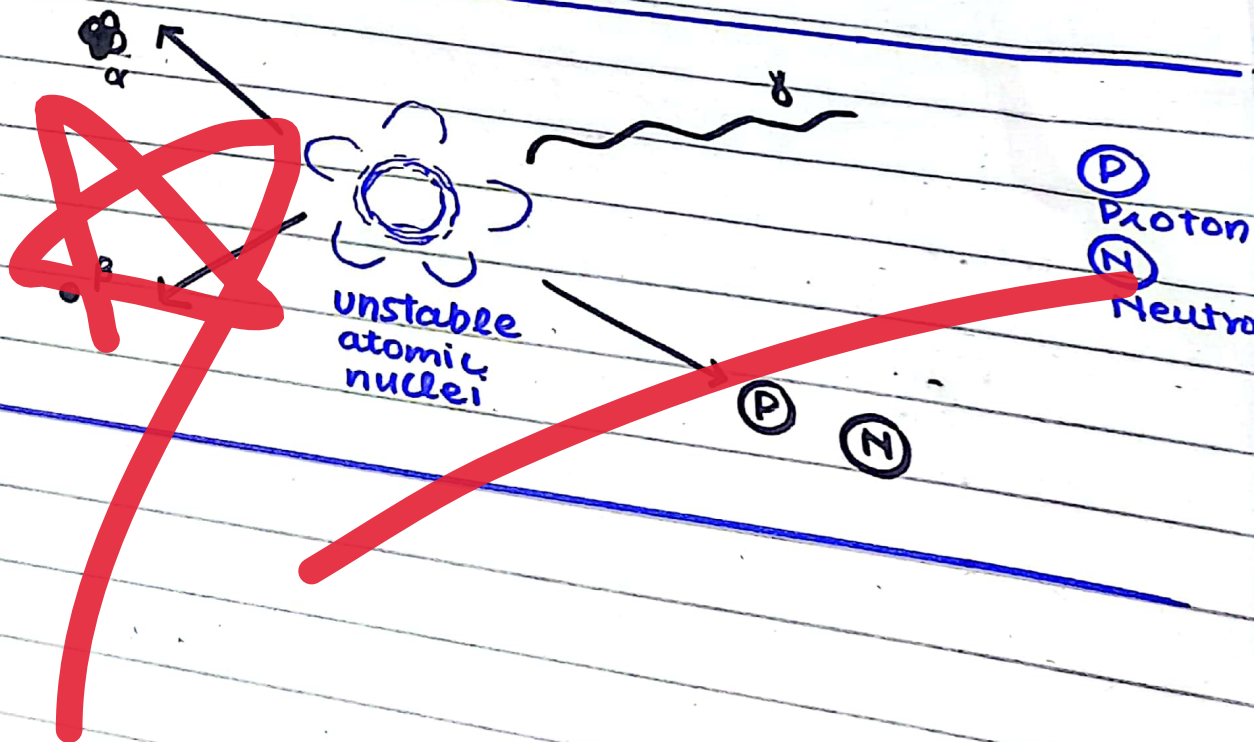
e.g;

$\alpha \Rightarrow$ alpha radiations

$\gamma \Rightarrow$ gamma rays

$\beta \Rightarrow$ beta rays

Radioactivity



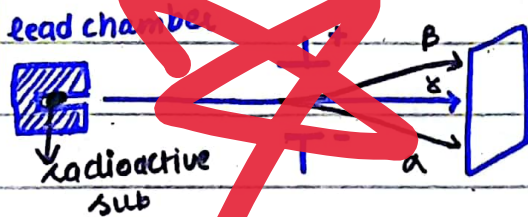
Difference between

Natural Radioactivity

1- Emission of radiations from an unstable nuclei due to self disintegration of nuclei is called natural radioactivity

2- This phenomenon is exhibited by elements with atomic number more than 83.

3- It cannot be controlled once started.

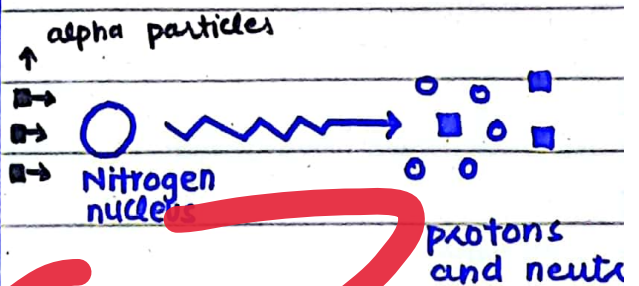


Artificial Radioactivity

1- Emission of radiations from an unstable nuclei through induced process is called artificial radioactivity

2- This phenomenon is exhibited by elements with atomic number less than 83.

3- It can be controlled.



(b)

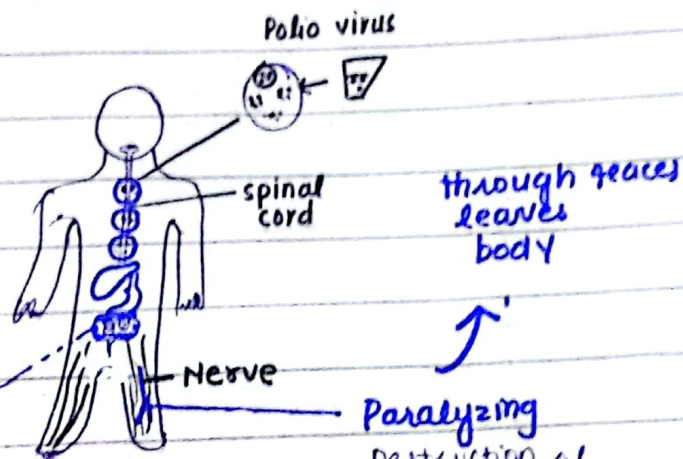
Polio

The poliomyelitis (Polio) is derived from a Greek word which refers to the inflammation of grey matter of spinal cord. It is a viral infectious disease that sometime causes paralysis.

Infection Cycle of Polio

① Entering the body

Polio virus enters the body through mouth with direct contact with infected person or indirectly via contamination



② settling in

virus first infects and replicates in cells of intestine. From where it can enter main bloodstream

③ Attacking body

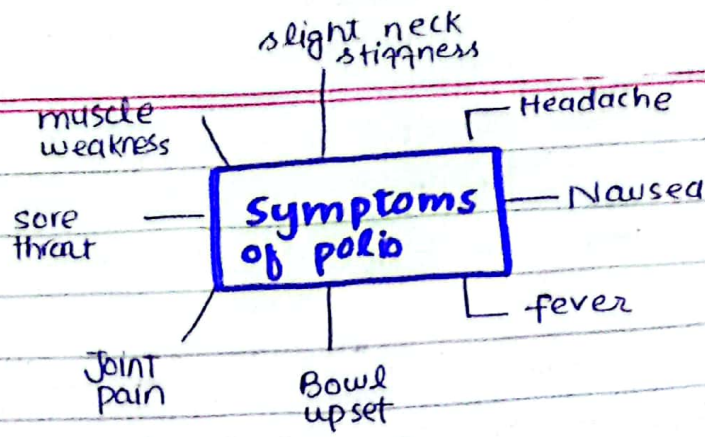
Paralyzing
Destruction of spinal cord result in paralysis

through oral-faecal route

Causes

through fecal oral route

Intake of contaminated food/water



Prevention

Most effective way to prevent polio is through vaccination. The polio vaccine is safe and highly effective.

Vaccine

2 Types

i - Inactivated Polio vaccine
(IPV)

• This vaccine contains a killed polio virus

ii → Oral Polio vaccine
(OPV)

This vaccine contains a weakened live polio virus.

* OPV is more effective vaccine

- (d) -

Population planning

Population planning also known as population control or family planning, is set of policies and programs designed to regulate the growth and size of population. It involves ~~serious~~ strategies aimed at influencing fertility rates, mortality rates and migration patterns.

Benefits of population planning

The benefits of population planning involves;

- i- Improved health and well-being
- ii- Enhanced education and economic opportunities
- iii- Greater choice and autonomy
- iv- Reduced poverty and inequality
- v- Improved environmental sustainability
- vi- Enhanced socio-economic development
- vii- Improved food security

Section - II

Q# 6

(a)

Given

Enrollment in Jan. 2022 = 850 pupils

Enrollment in Jan 2023 = 1120 pupils

To find

% age increase in enrollment = ?

Solution

To find

Increase in enrollment.

$$\begin{aligned} \text{Difference in} \\ \text{enrollment} &= 1120 - 850 \\ &= 270 \end{aligned}$$

$$\text{Percentage Increase} = \frac{(\text{increase in value})}{(\text{original value})} \times 100$$

$$= \frac{270}{850} \times 100$$

$$= 31.76\%$$

Hence, the percentage increase in enrollment is 31.76%.

(b)
Given

Suppose current age of boy = x
age of father = $5x$

To Find

Present age of father = ?

Solution

2 years ago

Age of father + Age of son = 114

$$(5x-2)^2 + (x-2)^2 = 114 \quad \text{--- ①}$$

Solve the equation

$$25x^2 - 20x + 4 + (x^2 + 4x + 4) = 114$$

$$25x^2 - 24x + 4 + x^2 - 4x + 4 = 114$$

:

$$26x^2 - 24x + 8 = 114$$

$$26x^2 - 24x = 114 - 8$$

$$26x^2 - 24x = 106$$

$$26x^2 - 24x - 106 = 0 \quad \text{--- ②}$$

Divide the equation by 2

$$\frac{1}{2} (26x^2 - 24x - 106) = 0$$

$$13x^2 - 12x - 53 = 0 \quad \text{--- ③}$$

Now, factorize the quadratic equation using quadratic formula

$$13x^2 - 13$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2(a)}$$

$$b = -12, \quad a = 13, \quad c = -53$$

Put values in formula

$$x = 12 \pm \frac{\sqrt{(-12)^2 - 4(13)(-53)}}{2(13)}$$

$$x = 12 \pm \frac{\sqrt{144 + 2756}}{26}$$

$$x = 12 \pm \frac{\sqrt{2900}}{26}$$

$$x = 12 \pm \frac{54}{26}$$

ignore -ve sign because
age cannot be negative

$$x = \frac{(12 + 54)}{26}$$

$$x = \frac{66}{26}$$

$$x = 3$$

So, the present
age of son
is 3 years

-(C)-

Given

No. of heads

of cows & hens = 48

hens

no. of feet

of cows & hens = 140

hens

To Find

No. of Hens = ?

Solution

Let the cows = C

Hens = H

$$C + H = 48 \text{ --- (1)}$$

$$C = 48 - H \text{ --- (2)}$$

As a cow has 4 feet and hen has 2 feet so,

$$4C + 2H = 140 \text{ --- (3)}$$

Put value of "C" from eq (2) in eq (3)

$$4(48 - H) + 2H = 140$$

$$192 - 4H + 2H = 140$$

$$-2H = 140 - 192$$

$$-2H = -48$$

$$2H = 48$$

$$H = \frac{48}{2}$$

$$H = 24$$

So, the number of Hens are 24.

(d)

Given:

Speed during first half = $v_1 = 40 \text{ kmh}^{-1}$

Speed during during 2nd half = $v_2 = 60 \text{ kmh}^{-1}$

To find:

Average speed = ?

Solution:

$$\text{Average speed} = \frac{v_1 + v_2}{2}$$

$$= \frac{40 + 60}{2}$$

$$= \frac{100}{2}$$

$$= 50 \text{ kmh}^{-1}$$

So, the average speed of car is 50 kmh^{-1}

Q # 7

(a)

Suppose the number = x

No. divided by 6 = $\frac{x}{6}$

then added 50 = $\frac{x}{6} + 50$

$$\frac{x}{6} + 50 = 60$$

$$\frac{x}{6} = 60 - 50$$

$$\frac{x}{6} = 10$$

Multiplying by 6 on both sides

$$6 \times \frac{x}{6} = 10 \times 6$$

$$x = 60$$

the number is 60.

(c)

odd one out?

8, 16, 24, 34, 40, 48

Solution

34 is odd one because all other numbers are multiple of 8.

$$8 \times 1 = 8$$

$$8 \times 2 = 16$$

$$8 \times 3 = 24$$

$$8 \times 4 = 36 \text{ not } 34$$

$$8 \times 5 = 40$$

$$8 \times 6 = 48$$

So, the odd one out of above series is 34.

(d)

Given :

height of tower = $h = 15 \text{ m}$

base = 9 cm

To find :

aerial distance = ?

Solution

Using Pythagorean theorem

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

$$(20\text{m})^2 + (15\text{m})^2 = c^2$$

$$400 + 225 = c^2$$

$$625 = c^2$$

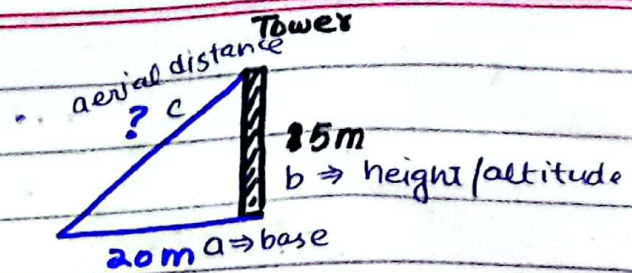
$$c^2 = 625$$

Taking under root on both sides

$$\sqrt{c^2} = \sqrt{625}$$

$$c = 25\text{m}$$

So, the aerial distance from top of tower is 25m



(d)

Given:

Tariff for odd dates = Rs. 1000

Tariff for even dates = Rs. 2000

Tariff paid by man = Rs. 30000

To find:

No. of days man stayed = ?

Solution:

Suppose man stayed for x days

The number of odd days = $\frac{x}{2}$

The number of even days = $\frac{x}{2}$

$$\text{Total amount paid} = \left(\text{no. of odd days} \times \text{tariff for odd days} \right) + \left(\text{no. of even days} \times \text{tariff for even days} \right)$$

$$30000 = \left(\frac{x}{2} \times 1000 \right) + \left(\frac{x}{2} \times 2000 \right)$$

$$30000 = 500x + 1000x$$

$$30000 = 1500x$$

$$\frac{30000}{1500} = x$$

$$x = 20 \text{ days}$$

So, the man stayed for 20 days in hotel.