Dos and Don'ts for Generaral 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 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.
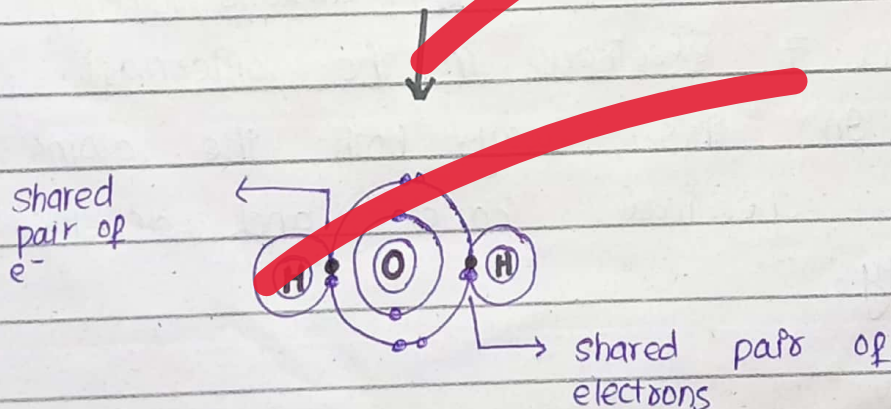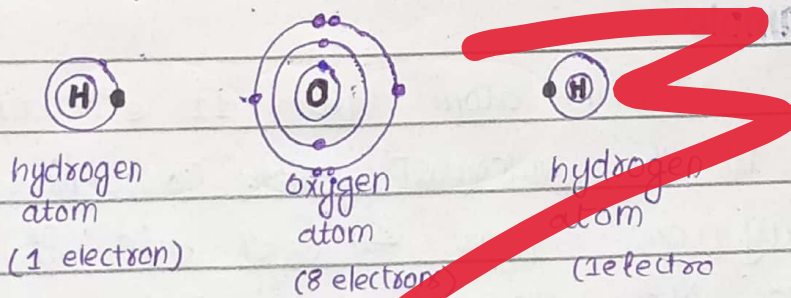
Good luck for CSS 2025. You're gonna rock in sha Allah. :)

$_{11}Na$ $_{17}Cl$
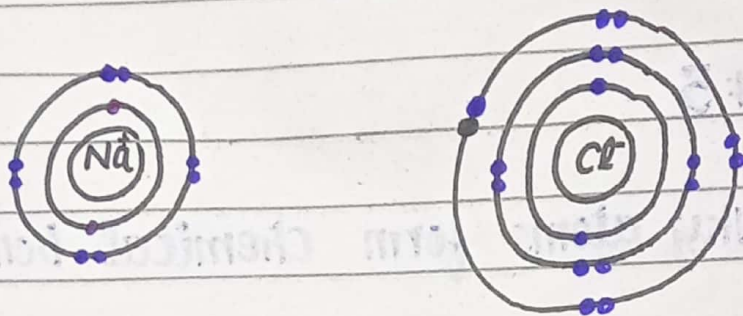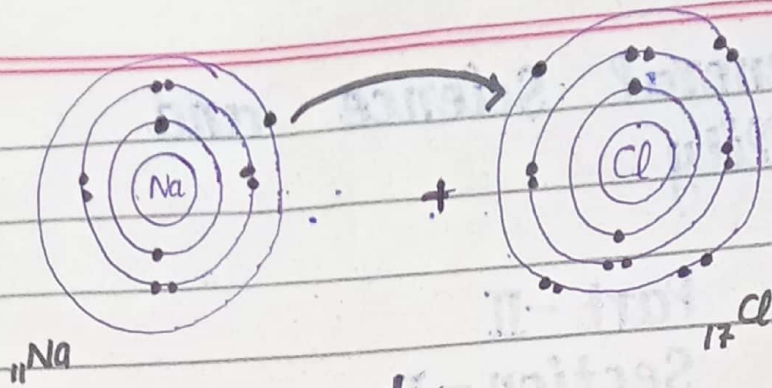
NaCl

Covalent bond in water

H_2O (water) molecule is held together by covalent bonds covalent bond is formed by sharing of electrons.

hydrogen atom
(1 electron)

oxygen atom
(8 electron)

hydrogen atom
(1 electro

shared pair of e^-

→ shared pair of electrons

Both Hydrogen atoms share their electrons
with oxygen atom and form a covalent bond.

$$H - O$$
$$|$$
$$H$$
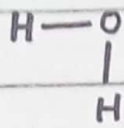
(water)

(b)
Doping

"The process in which impurity is introduced
into the semi-conductor to enhance its
conductivity is called Doping."

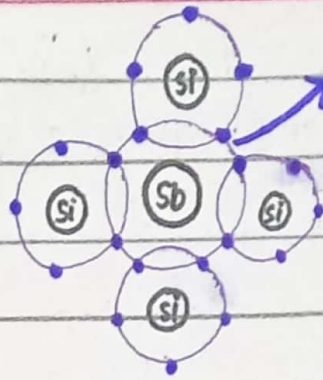2 - Types (on basis of impurities)

N- Type   P- Type
Semi-   semi- conductors
conductors

1- N- Type Semiconductor

The semiconductors formed as a result
of dopping of a pentavalent electron
donor impurity like Arsenic or Antimony
in the Germanium or Silicon are
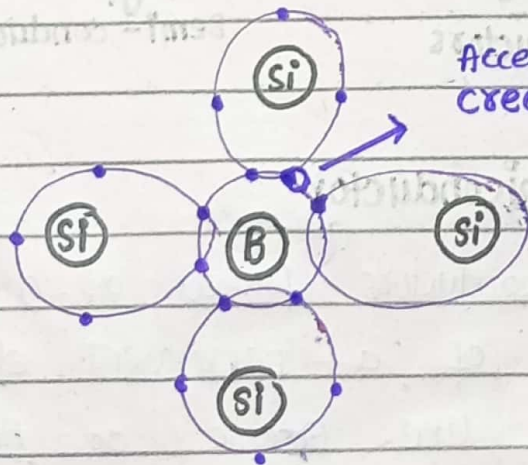called N- Type semiconductors.

• Donor impurity contributes free electrons

Sb = Antimony ⇒ added as impurity
Si = Silicon

P-Type semi-conductor

     The semi-conductors formed as a result of doping of a trivalent electron deficient impurity like Boron in Germanium or silicon are called P-type semi-conductors

Acceptor impurity creates a hole

B ⇒ Boron ⇒ Added as impurity.

Types of Ceramics

Types	Description	Uses	Examples
Earthenware	• Clay-based • Clay fired at relatively low temperature • These are Porous, brittle and colorful.	• Tableware • Decorative objects	• Delft • Majolica
Stoneware	• Clay-based • Clay fired at mid temperature (1200°C) • These are dense, strong and water resistant	• Cookwares • Cups, Mugs	• Ceramic plates
Porcelain	• Clay-based • Fired at high temperature in between (1200 – 1450°C) • They are Translucent, strong and durable	• Fine china • Decorative figurines	• Fine china dinner sets

(C)
Merits and demerits of Global Warming

Merits of Global Warming

The merits of global warming are as follows:

1- The Arctic, Antarctic, Siberia and other frozen regions of earth may experience more plant growth and milder climates.

2- The next ice-age could possibly be prevented.

3- The Northwest passage through the formerly icy canadian Arctic Archipelago could arguably open up to transportation.

4- Feweth deaths or injuries due to arctic conditions.

5- Longer growing seasons could mean increased agricultural growth in some areas.

Demerits of Globalization

1- Changes in ocean circulation and the resulting warmer temperatures disrupt the world's normal weather patterns, bringing about more extreme weather.

2- Higher sea levels lead to flooding of lowland. Islands and coastlands are engulfed by water leading to deaths and disease due to flooding.

3- Deserts become drier, leading to increased desertification.

4- Decreased agricultural productions leads to the food shortages

5- Insect - borne diseases increase

(d)
Polio

The poliomyelitis (polio) is derived from a Greek word which reffers to the inflammation of grey matter of Spinal cord. It is a viral infectious disease that sometimes cause paralysis.

Life Cycle of Polio

① **Entering the body**
Poliovirus enters the body through mouth, direct contact with infected person or indirectly via contaminated items

Drinking ware

Polio virus
Spinal cord

leaves body through feaces
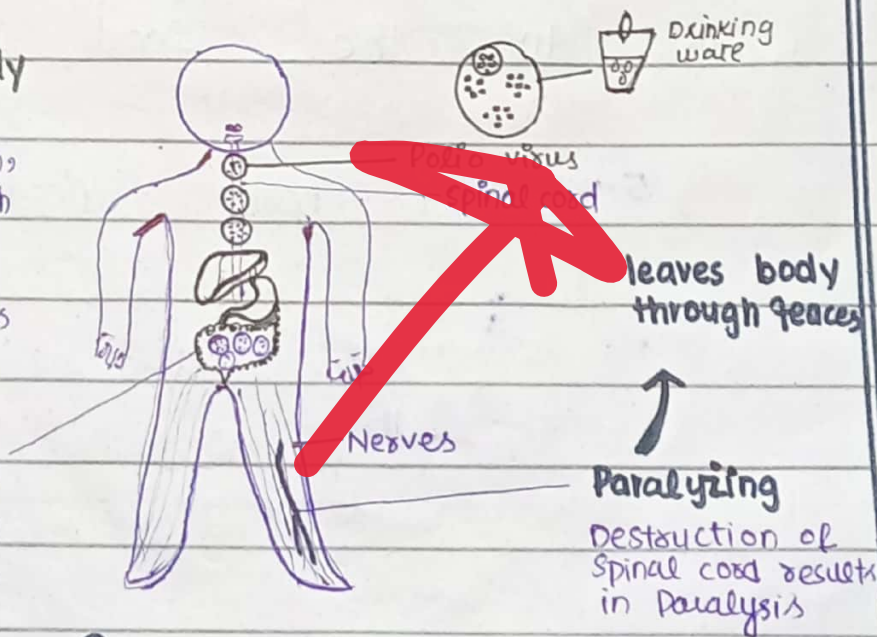
② **Settling in**
virus first infects and replicates in cells of bintestine. From where it can enter main bloodstream

Nerves

Paralyzing
Destruction of Spinal cord results in Paralysis

③ **Attacking body**
out of every 200 virus attack central Nervous System destroying Cells of Spinal cord

Polio infects mostly children and young adults.

Challenges for eradication of Polio in Pakistan

There are several challenges for eradication of Polio in Pakistan

1- **Security challenges** in some parts of country, particularly in the Southern reigion of Khyber Pakhtunkhwa Province.

2- **Vaccine hesitancy** in some areas

3- **Surveillance gaps** in Pakistani system needs improvement for detection of polio, which leads to delayed detection and response to outbreaks

4- **Inadequate coverage and low immunization** rates in certain provinces and districts.

5- **Insecurity and attacks** on polio workers and their security personels

6- **High population mobility** and migration across the border with Afghanistan

7- **Limited access to healthcare services** in remote and conflict-affected areas.

Q # 4

(a)
Bile Juice

Bile is a bitter tasting, dark green to yellowish brown fluid, produced by the liver and it is stored in gallbladder and uppon eating is discharged into duodenum.

The principal function of **gallblader** is to serve as a storage reservoir for bile

Composition of Bile Juice

i- water (85%)
ii- Bile salts (10%)
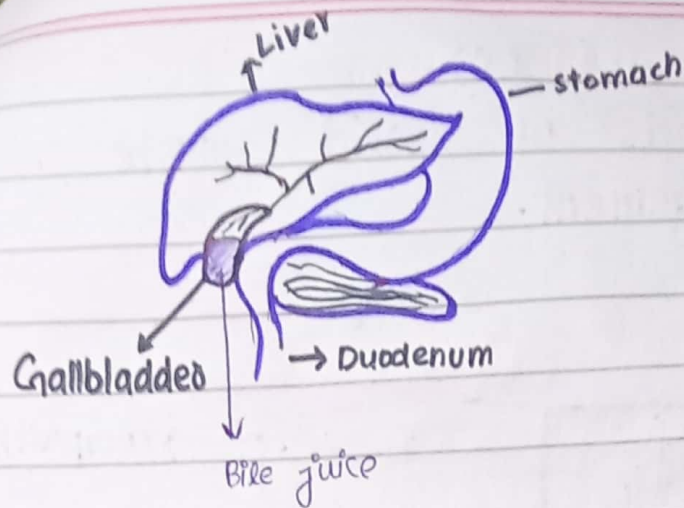iii- Pigments (3%)
iv- Bile pigments
v- Fats (1%)

Physical properties of bile

Hepatic bile	Bladder bile
→ pH 7.4	→ pH 6.8
→ color golden yellow	→ Color green dark to Yellow

Liver — stomach

Gallbladder → Duodenum

Bile juice

Functions of bile juice

① - Bile salts acts as emulsifying agents in the digestion and absorption of fats.

② - Bile salts also acts as bactericides, destroying many of microbes that may present in food.

③ - One of the important function of bile is the neutralization of excess acid in stomach, before it enters the ileum.

(C)

Methods of solid waste management.

open dumping ← ... → composting

Methods for solid waste management

Incineration ← ... → Landfill Method
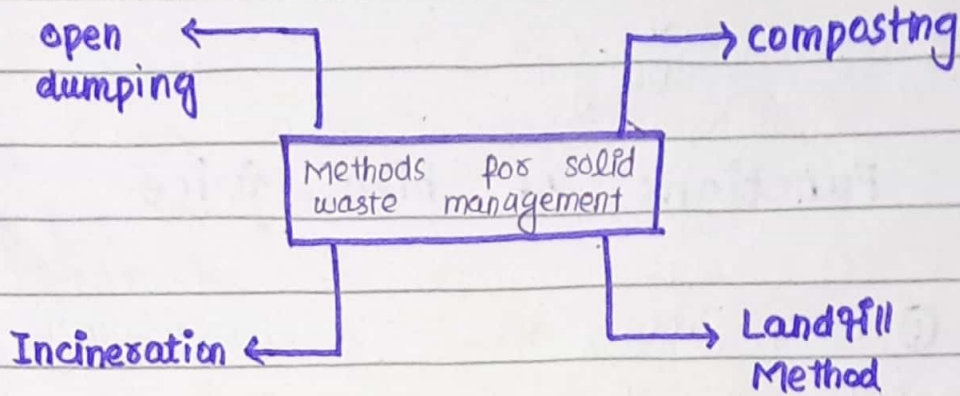
1- Open dumping

- It is common practice which involves the open deposition of waste in the sorroundings.
- Dumping sites should be away from residential, commercial areas, crops and water bodies

Composting

- It is the controlled biological degradation of waste mostly organic wastes (plants, animals wastes
- Some parameters needed to be adjusted for composting process

    ↳ Carbon, Nitrogen Parameters

    ↳ PH

    ↳ Availability of Oxygen

Bacterial and fungal species are used for decomposition.

Bio-Fertilizer: As a result of composting waste in the end the compost formed can be used as biofertilizers, rich in nutrients essential for plant growth.

3- Incineration

- Burning of waste material (other than organic) using incinerators is called incineration.

  Incinerators used are:
  - ↳ Simple - chambered
  - ↳ Multi - chambered
  - ↳ Industrial incinerators.

4- Landfill Method

- Burying of the waste in barren lands.
- Specific pits and landfills are filled after depositing waste.

i) Anemia

- Anemia is a blood disorder that happens when a person does not have enough red blood cells or red blood cells are not working as they should.
- Anemia can be inherited or acquired during lifetime

Symptoms
↳ Chest Pain
↳ Dizziness
↳ Fatigue
↳ Pale skin color
↳ Shortness of
↳ breath

Normal RBCs   Anemia
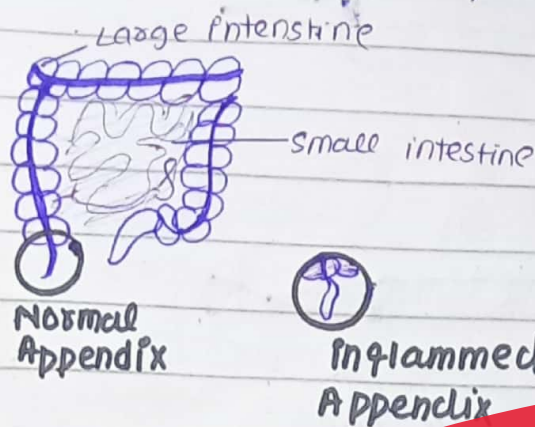
ii)- Appendictis

Appendictis is a condition in which appendix becomes inflammed. It almost always requires

surgery as soon as possible

Large intenstine

small intestine

Normal
Appendix

Inflammed
Appendix

ii) Spleen

It is a small organ inside the left rib cage, just above the stomach.

It is the part of lymphatic system and stores and filter blood. It also makes white blood cell that protect from infection.

iv) Myopia

Myopia also known as nearsightedness is an eye-disease where light from distant objects focuses in front of, instead on, the retina. As a result, objects appears blurry while close object appear normal.

Normal eye

object

(clear vision)

object

(blurred vision)
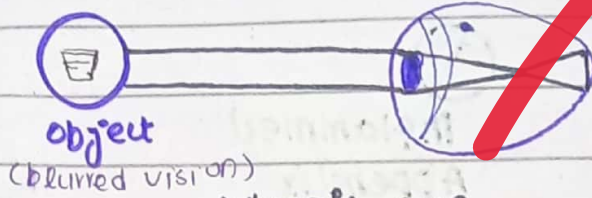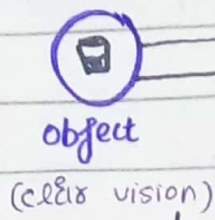
Myopic eye

v) **Isotones**

Species having same number of neutrons are called isotones

ex.

Oxygen $\quad ^{16}_{8}O \quad (p=8, n=8)$

Nitrogen $\quad ^{14}_{7}N \quad (p=7, n=8)$

Carbon $\quad ^{12}_{6}C \quad (p=6, n=8)$

p = proton

n = neutron

Q no 7

(a)
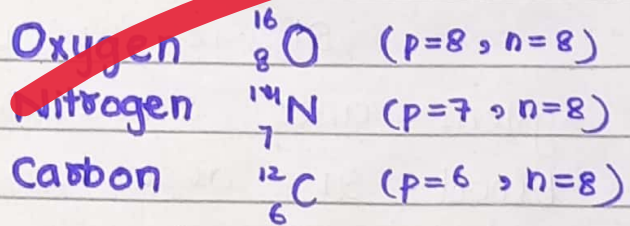
Given

Radius of cylinder = R = 30cm

$$= \frac{30}{100} = 0.3m$$

Height of cylinder = h = 1m

Find

volume of cylinder = V = ?

volume = π × radius² × height

$$= π × (0.3)^2 × (1)^2$$

$$= 3.14 × 0.09 × 1$$

$$= 0.2826 m^3$$

volume of cylinder is 0.2826 m³

(b)

Average age of three boys = 15 years

Age of boys in ratio = 3:5:7

Age of youngest boy = ?

As average age of 3 boys is 15 year so,

Total age = 15×3

$$= 45 years$$

Age in ratio means

$$3x : 5x : 7x$$

Total age of boys

$$3x + 5x + 7x = 45$$

$$15x = 45$$

$$x = \frac{45}{15}$$

$$x = 3$$

Age of youngest boy is $3x$

$$= 3x$$

$$= 3(3)$$

$$= 9 \text{ years}$$

Hence, the age of youngest boy
is 9 years.

Identify the series

i) 8, 19, ~~452~~ 151, 447, —

Series is obtained by multiplying the previous terms by 2.37 approximately

$8 \times 2.37 = 19$

$19 \times 2.37 = 45 \Rightarrow$ this is correct

$45 \times 2.37 = 151$

$151 \times 2.37 = 447$

$447 \times 2.37 = 1060$

$\Rightarrow$ wrong no in the series is 52 because the answer obtained after multiplying the 19 with 2.37 is 45

complete series

19, 45, 151, 447, 1060

ii) 13, 17, 19, 23, —

This series appears to be obtained by adding 2, then 4, then 2, then 4 and so on in the previous terms

$13 + 2 = 13$

$13 + 4 = 17$

$17 + 2 = 19$

$19 + 4 = 23$

$23 + 2 = 25$

13, 17, 19, 23, 25

Q6

(a)

Ratio of blocks = A : B : C : D

$$4 : 7 : 3 : 1$$

The number of 'A' blocks is 50 more than the number of 'C' blocks

Calculations:

Let the blocks A, B, C and D be

$$4x, 7x, 3x \text{ and } x$$

$$A = 4x$$
$$B = 7x$$
$$C = 3x$$
$$D = x$$

$$4x = 3x + 50$$

$$4x - 3x = 50$$

$$x = 50$$

No. of B Block

$$7x \rightarrow 7(50)$$

$$7x \rightarrow$$

$$\boxed{B = 350}$$

Therefore, there are 350 B blocks

(b)

Original cost of shoes = $80

Discount on original cost = 15%

Sale tax = 10%

Final Price = ?

Discount calculation

15% of $\$80 = \dfrac{15}{100} \times 80$

$\qquad\qquad\qquad = 0.15 \times 80$

$\qquad\qquad\qquad = \$12$

Discounted price $= \$80 - \$12 = \$68$

Sale tax calculation

10% of $\$68 = \dfrac{10}{100} \times 68$

$\qquad\qquad\qquad = \$6.80$

Final Price $= \$68 + \$6.80$

$\qquad\qquad\quad = \$74.80$

So, the final price is $74.80

(c)

Departure time of train = 4pm

Distance travelled between two stops = 42km

Speed of train = 36km/hr

Time = Distance / speed

$= 42km / 36km/hr$

$= 1.17$ hours

Since, the train departs at 4pm, you can add travel time to find the arrival time

Arrival time = 4pm + 1 hour 17 min

$= 5:17pm$

So, the train arrives at 5:17pm.

(d)

Arrange jumbled words

i) teninsupeoted

Superintendent.

ii) hweti

White