

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 for each 5-mark part. Stick to this to avoid rushing later.
3. Make your answers look scientific, not just theoretical. Use charts and diagrams wherever they add clarity.
4. Neatness matters - keep your handwriting clear, 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.

PART - I
SECTION - I

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

Answer no. 3

a) Candy ratio problem
 Given: Packets in flavors Apple : Berry : Cherry : Date = 3 : 6 : 2 : 5.
 Asked: If Apple candies exceed Date candies by 35, how many Berry candies are there?

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 candies exceed Date if ratio is 3:5).

1. If the problem truly intends Apple - Date = 35, that's impossible with the given ratio (would require negative common factor).
 Similar cells combine to form tissues

2. Most likely the intended meaning is Date exceeds Apple by 35 (i.e. Date - Apple = 35). I will solve that reasonable interpretation.
 which converted into specific organelles

Formula: Let common factor = k. Apple = 3k, Date = 5k.
 So $5k - 3k = 35 \Rightarrow 2k = 35$
 by performing special functions. So they form organelles to perform specialized functions in the body, division of labour and specific functions of organelles to carry out complex functioning of body. All these complex activities only possible to carry out when cell form organelles each specialized for special functions.

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)

b) Camera discount + tax
 Given: Original price = \$200. Discount = 25% after discount 6% tax.
 Asked: Total amount paid.

Formula / Steps:
 Discount amount = 25% of 200 = 0.25×200
 Sale price = 200 - 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 ÷ Speed.
 Solution: Time = $36 \div 18 = 2$ hours. Start 1:00 PM, end 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 cm³
 Answer:
 The volume of the sphere is approximately 1437.33 cm³

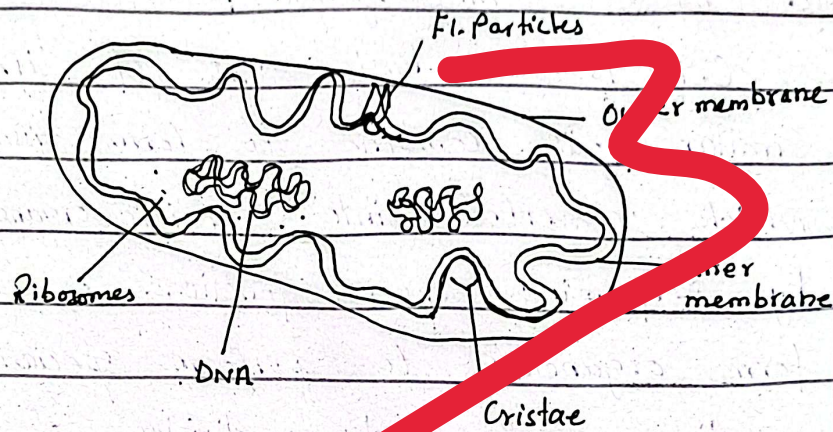
(b) Five friends' savings (total Rs. 25,000; ratio 1:2:3:4:5)
 Given: Total = Rs. 25,000. Ratio = 1 : 2 : 3 : 4 : 5.
 Asked: Smallest share (the "1" part).
 Formula: Sum of ratio parts = 1+2+3+4+5 = 15. Smallest = $(1/15) \times \text{total}$

Mitochondria in human cell:
 Mitochondria is a double membrane, self-replicating organelles present in animal cell. It is known as the "power house of the cell". Many processes of human body as metabolic processes such as glycolysis and ATP synthesis occurs in mitochondria. It is self-replicating organelle because it has its own DNA (genetic material)

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So, it can self-replicating.

The structure of mitochondria is:



Outer membrane is smooth, while inner membrane has many folding and it is strong, the foldings are as cristae, knob-like structures present are known as f₁-particles and having its own DNA.

b. Doping, different types of Semiconductors

Doping is the phenomena in which a little impurity is added to a pure semiconductor to enhance its conductivity, so it can conduct electricity. Semiconductors are Silicon and Germanium.

There are two types of Semiconductors

- 1- N-type semiconductors
- 2- P-type semiconductors

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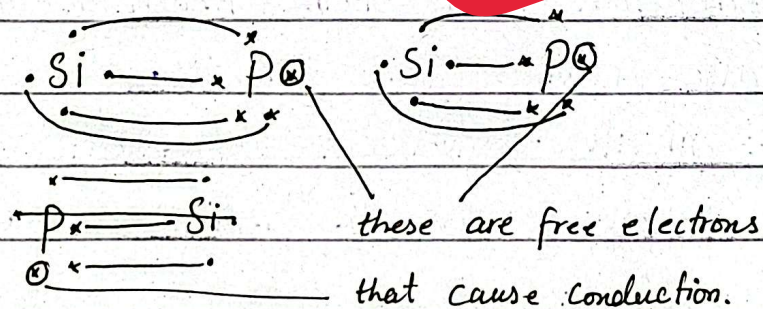
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1. N-type Semiconductors:

Semiconductor having properties between Insulator and Conductor. Is silicon a semiconductor having 4-valency, Add pentavalent impurity phosphorus (P5) into this to make it conductive.

Si 4 valencies satisfied with P5, and one P remains out of bonding because of having no available electron. It behaves as hole +ive.

It is doped and when current provided to it, it pass^(-ive) electron by attraction on positive holes and become N-type Semiconductor.

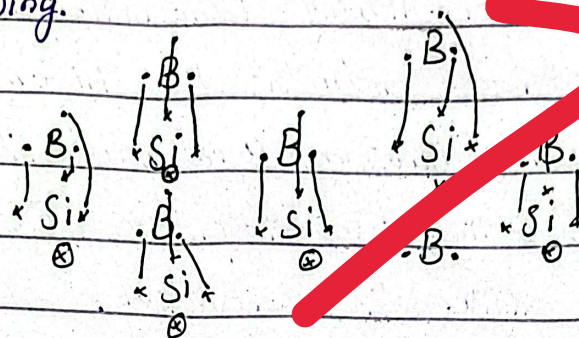


2. P-type Semiconductors:

In this type of Semiconductors, add impurity like Boron having trivalent nature. Electrons of Silicon and Boron get bonded and one electron of silicon remains

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free, which conduct electricity after doping.



The free electron of Si here act as the conductor of electricity, it is known as P-type semiconductors.

C. Merits and Demerits of volcanic eruption:

Volcanic eruption is the outbursting of Earth's magma in the form of lava, it is known as volcanic eruption. It is both beneficial and also having some demerits.

→ Merits of volcanic eruption:

Following are the merits of volcanic eruption:

1. Rich source of minerals elements:

The volcanic eruption contains rich amount of mineral elements mainly phosphorus, potassium etc which are important for the growth of plants and vegetation.

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on land.

2. Formation of new land:

After volcanic eruption, land converted into its new form with rich minerals as ash and lava when get dried & provide land with richness that is fruitful for crop land. Example land in Iceland mainly formed by ~~lava~~ volcanic eruption.

3. Source of minerals:

volcanic regions are rich in minerals like gold, copper, silver and diamond. In such countries mining industries around eruption zones give treasure to the country's economy.

4. Geothermal energy:

Heat from volcanic eruption can be used to generate electricity.

→ Demerits of volcanic eruption:

Following are demerits of volcanic eruption:

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1. Loss of life and property:

Volcanic eruption mainly affect the land used by humans or any crop land, it causes loss of crops, vegetation and other lives on that part of land. So, from that region people used to shift to other areas by leaving their properties behind.

2. Climate change and Pollution:

The eruption contains many hazardous gases, which are very dangerous for human health and even for the surrounding environment which causes atmospheric pollution and it is a big threat for ecological damage and human health. Mainly nitrogen oxides, Sulphur oxides and carbon monoxide contribute to atmospheric pollution.

3. Economic loss :

In volcanic eruption areas people displaced and then no one will ready to go back to those regions, so such areas neglected

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from agricultural view or any other business opportunities there. So, such parts of countries lose their economy.

d. What is Dengue, symptoms, causative agents and remedies:

Dengue is a viral disease caused by the bite of female Aedes mosquito.

→ Symptoms:

Symptoms of Dengue includes:

1. fever with chills
2. Bleeding gums
3. Joint pain
4. Headache
5. Tiredness
6. Abdominal pain
7. Loss of white blood cells, mainly affect the immune system.

→ Causative agents:

Dengue is caused by the bite of mosquito mainly female Aedes mosquito. Generally present in moist and marshy areas where they reproduce and sometimes cause dengue on large level as pandemic.

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→ Remedies to prevent Dengue:

Safety measures are crucial to prevent dengue. like wearing full sleeve clothes, cover the body and use mosquito repellents.

→ If one get ~~it~~ of dengue, visit the doctor and stay under observation. Take fruit juices and food to recover WBC's that strengthen the immune system.

→ for fever, headache and joint pain must take paracetamol.

Qno.4 note on Plant kingdom "chlorophyll".

Plant kingdom is the group of plant families. Multicellular eukaryotes and prokaryotes included in this kingdom. These are autotrophs prepare their own food by using sunlight, through the process of "photosynthesis" that occurs in the mesophyll cells of leaves. Plants are mainly known as producers in the food chain.

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→ Chlorophyll :

It is the green pigment present in plant's leaves, stems etc. It contains mesophyll cells which are major sites of food production "Photosynthesis". It is also present in some algae and cyanobacteria. It absorbs sunlight, captures CO_2 and converts it into glucose and oxygen, main survival for lives of human.

Chlorophyll is like the hemoglobin (protein) of human blood that captures oxygen in body.

b. Role of Ribosomes in protein synthesis:

Ribosomes are present in nucleus and are sites for protein synthesis.

• Read the sequence of mRNA:

mRNA carries the message to the nucleus and ribosome reads and decodes the message and according to this arranges the amino acids.

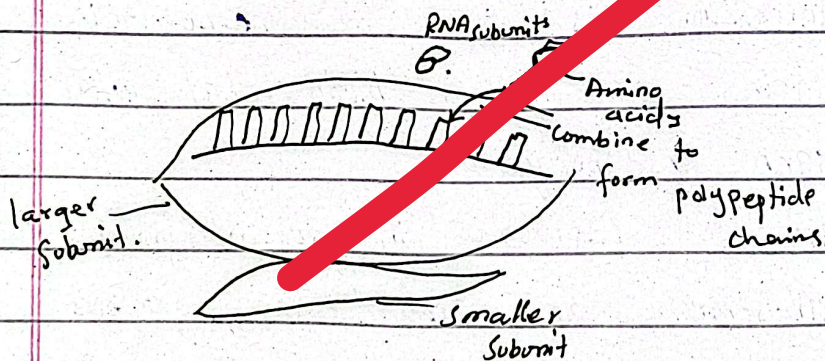
• Arrangement of Amino acids:

Then amino acids combine in a linking by forming glycosidic bonds and form the structure

of protein according to the message provided by mRNA.

• Polypeptide chains:

Amino acids align to make polypeptide chains and form primary, secondary and tertiary proteins. most complex forms converted into Quaternary structure. transfer RNA (tRNA) helps to bind these AA in a sequence.



→ Messenger RNA, ribosomal and transfer RNA work to form protein by amino acid linkages.

C. Methods of Solid waste management:

Solid waste management can be done through following methods:

1. Open dumping:

This method includes the process where all the wastes

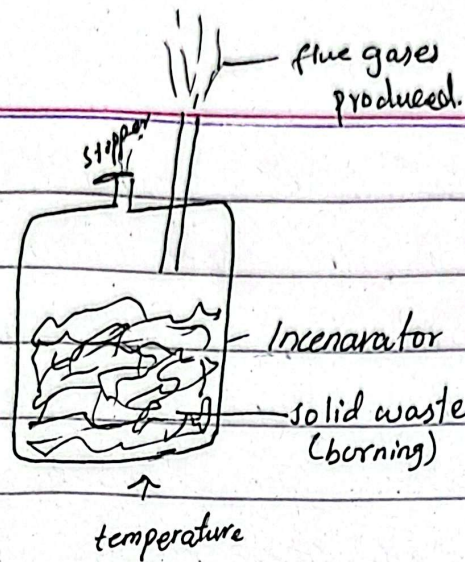
of cities collected and openly dumped away from city in open and unpopulated or inhabitant area, mostly along side the ocean or the marginalized areas. Open dumping cause serious spread of diseases so, this method is strongly encouraged to collect solid waste.

→ Burning of solid waste:

Collected waste is dumped into the pits or on open land and burn it. It also cause serious air pollution but it is practised and least recommended.

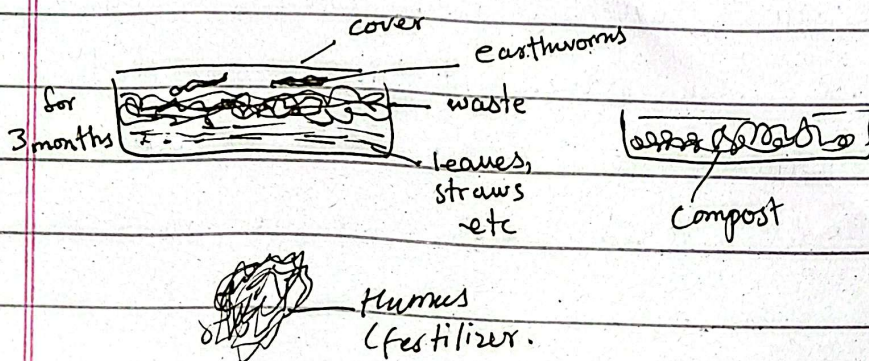
→ Incineration:

It is also the burning of waste but in a close incinerator under controlled temperature to reduce the volume of solid waste. It mainly includes the hospital, municipal and industry waste, which get burned but in close way. It is recommended method to control the waste and solid waste management.



4. Composting:

Waste is collected in large pitfall and left it for many months and under the action of microorganisms to eat it and converting into decayed form by the action of worms mainly. which converted it into Humus (fertilizer) and can be used in croplands and also the best method for solid waste management cause it very less pollutants but beneficial byproduct. So, it is highly recommended method for solid waste management.



d. Biofuels:

The fuel that is directly produced from biomass. It is the organic waste of plant, animals and algae etc.

For example: Animal dung, animal fat, Plant trunk, leaves, seeds etc. (sugar cane, sugar beet).

Alternate energy source and environmental friendly.

→ Hydrosphere:

The sphere of the Earth mainly ~~composed~~ ^{containing} of water, having water bodies. It includes oceans, lakes, rivers, streams. It is also present beneath Earth surface the hot springs, geysers, wells etc. Hydrosphere mainly contribute to the water cycle of life.

Earth comprise of ~~70%~~ ^{70%} water contents.

→ Troposphere:

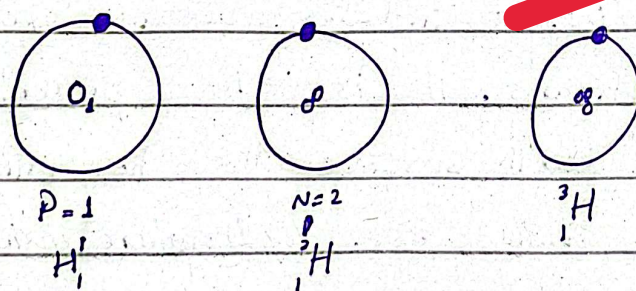
The sphere of gases present just above the earth surface, extend from ~~0 to 10 miles~~ ^{miles upto 10 km}. It is the layer

of gases which surrounds the biosphere. Nearly all weather phenomena occurs in this sphere. It contains 8% of all and 90% water vapours.

→ Isotopes:

The properties of elements having same number of atomic number (proton) and different mass number (of neutron). for example.

Hydrogen has three isotopes namely, Protium, Deuterium, Tritium all having same number of proton but different neutrons.



isotopes of hydrogen.

→ Adulteration:

Addition of impure and cheaper substances to the product just to increase the quantity by compromising the quality of

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product. for example generally adulteration of food items as adding some water to milk and food colors to ~~make~~ quantify it, but compromising quality of food.

SECTION - II

b. Camera paid price at 200\$

25% off

Tax = 6%

Total amount = ?

$$200 \times 25\% \Rightarrow$$

$$\frac{125}{400} = \frac{1}{4} = 0.25$$

$$200 \times 0.25 = 50$$

$$\text{price after discount} = 200 - 50 = 150$$

→ calculate tax amount:

$$150 \times 6\%$$

$$6\% = \frac{36}{100} = \frac{3}{50} = 0.06$$

$$150 \times 0.06 = 9$$

$$\text{Total amount paid} = 150 + 9 = 159$$

$$\text{total amount paid} = 159$$

c. Distance covered = ~~36~~ 36 km

Speed
~~Time taken~~ = 18 km/hr

Time = ?

Started at = 1 pm.

Time = $\frac{\text{Distance}}{\text{speed}}$

1 pm starting time.

$$\frac{36 \text{ km}}{18 \text{ km/hr}} = 2 \text{ hr}$$

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

Bicycle reaches at 3 pm.

d. Unscramble math terms:

i. STSTAICTS = STATISTICS

ii. LGEBMAR = ALGEBRA