

Do's and Don'ts for General Science & Ability Paper

General Science & Ability

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.

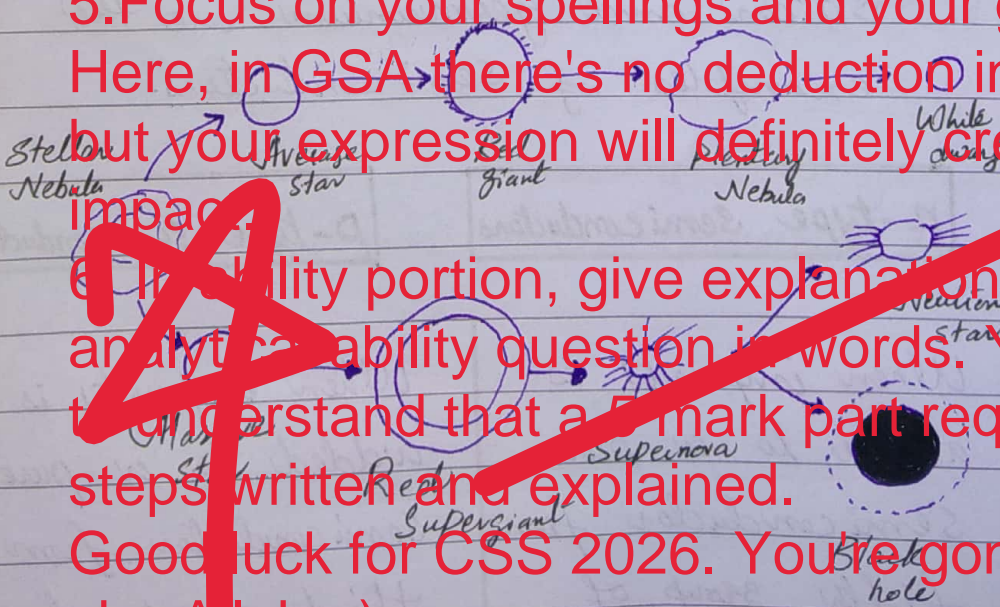
Section-1

Question Mark

- (a) 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.
- (v) 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.

Life cycle of a star from

Nebula to or Black Hole



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 2026. You're gonna rock in sha Allah. :)

A star's life begins in a nebula, collapsing into a protostar, then a stable main sequence star (like our sun) fusing hydrogen. Massive stars evolve into red supergiants, explode as supernovae, leaving behind neutron stars or black holes. White smaller stars become red giants, shed layers as planetary nebulas, and end as white dwarfs.

b. Semiconductors

Semiconductors or half conductors are materials having electrical properties in between the conductors and insulators.

Silicon and Germanium are the examples of semiconductors.

n-type semiconductors

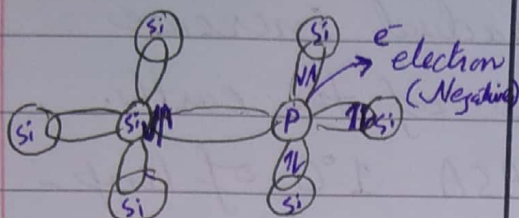
When impurity is added to a pure semiconductor from fifth group of

p-type semiconductors

When impurity is added to a pure semiconductor from third group of

③

periodic table, n-type
Semiconductor is
formed.

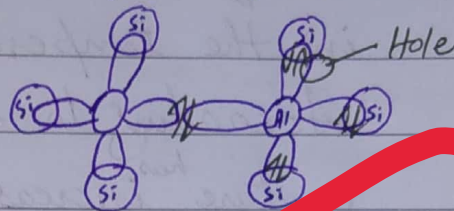


4-bonds silicon.
Phosphorous can
make 5-bonds.

periodic table, p-type
Semiconductor is formed.

Al from group-III

Si from group-IV



Hole is just a deficiency
of electron brings positive
charge.

Modern Applications

Diodes: Essential for rectifying AC to DC power in power supplies, protecting circuits, and LEDs (Light Emitting Diodes).

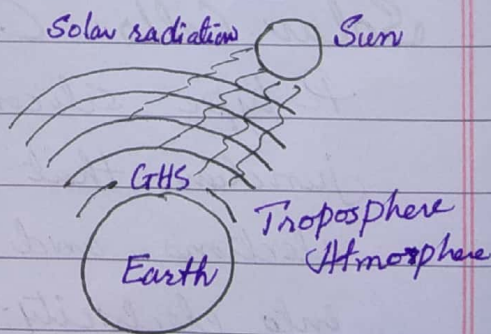
Solar Cells: Combine N-type and P-type silicon to create a PN junction that separates photo-generated electrons and holes, converting sunlight into electricity.

C. Global Warming

Global warming is all about an average and gradual increase in the temperature of the earth. According to NASA 1°C of temperature ^{has} increased over the past 124 years. According to IPCC 1.2°C temperature has been increased since 1850 to 1800 and this temperature was further potential to increase 1.4°C to 5.8°C by 2040. Global warming is caused by greenhouse gases and depletion of ozone layer.

Green-house Effect

It is a thermal process in which the heat gets trapped into the atmosphere under the action of green-house gases. It is a natural process.



Now this normal natural process

has been accelerated due to increasing level of green-house gases. It is named as enhanced green-house effect.

Greenhouse gases

- (i) Carbon dioxide (CO_2)
- (ii) Methane (CH_4)
- (iii) Chlorofluorocarbons (CFC)
 CF_4 Chlorotrifluoromethane

cb. Tsunami

Tsunami is a series of large ocean waves caused by sudden movements of Earth's crust. These waves travel at very high speeds and can cause severe damage when they reach coastal areas.

Natural Process that trigger Tsunami

1. Underwater Earthquakes

When tectonic plates suddenly move, the seafloor can rise or fall.

This displacement can push a massive amount of water, forming

(6)
tsunami waves.

2. Volcanic Eruptions

Explosive eruptions of a volcano into the sea can displace water.

Tsunami Impacts on Coastal Areas

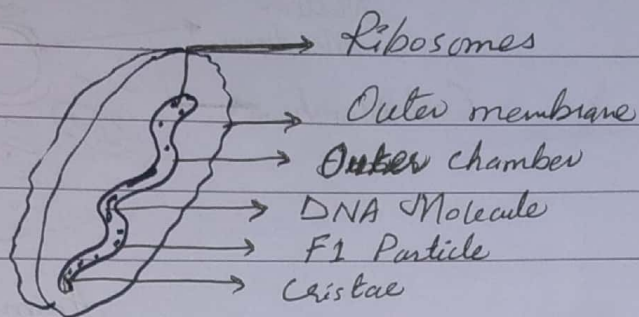
1. **Flooding:** Large area along the coast can be submerged within minutes.
2. **Strong currents and waves force:** They can destroy buildings, bridges, boats, and roads.
3. **Loss of life:** Most casualties happen due to drowning.
4. **Environmental damage:** Coastal ecosystem such as mangroves and coral reefs may be damaged.

~~Disaster~~

Question No. 3

(a) Mitochondria

Structure And Function Of Mitochondria



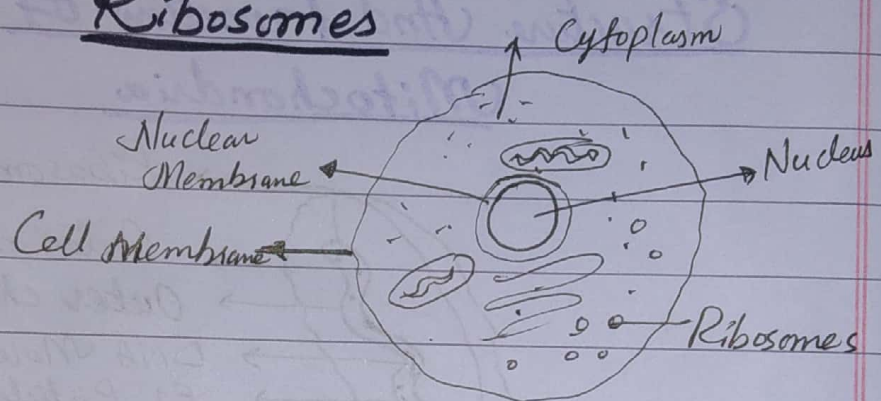
Mitochondria is double membraneous consisting of an outer membrane and inner membrane. The inner membrane is folded in Cristae which increase the surface area of cellular respiration, and the central region enclosed by the inner membrane is called the matrix.

Mitochondria (Power House of Cell)

The process of cellular respiration occurs in mitochondria, which results in the formation of ATP (Adenosine Tri-Phosphate). ATP is the energy currency of cell. Mitochondria is called the

power house of cell due to this energy form action. The number of mitochondria varies from cell to cell.

Ribosomes



Animal Cell

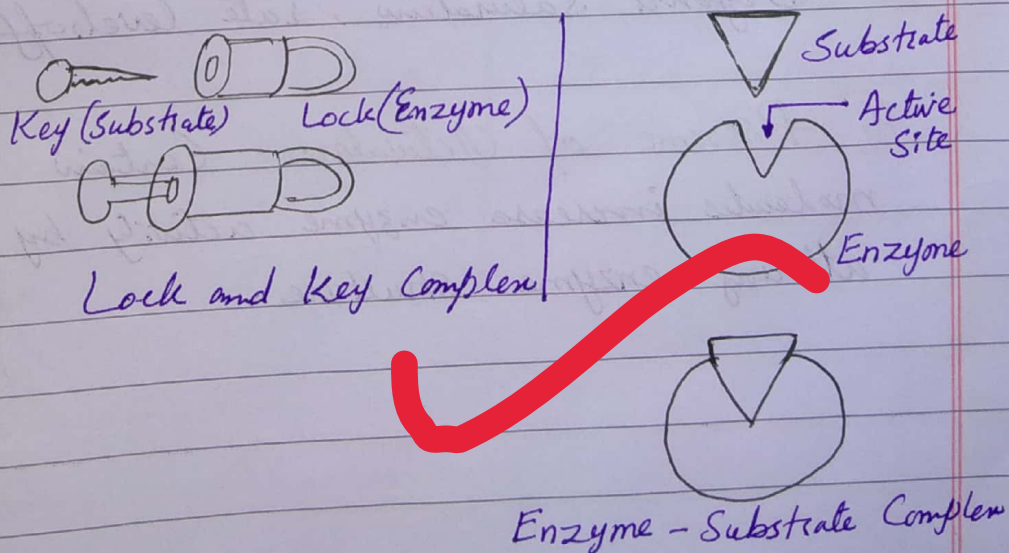
Ribosomes in animal cell found free in the cytoplasm or attached to the rough endoplasmic reticulum (RER). Ribosomes are responsible for protein synthesis for internal use or secretion.

(b) Enzymes

Enzymes are biological catalysts. They are proteins that speed up the chemical reactions in living organisms without being used up in the process.

Lock-and-Key Model of Enzyme Action

The enzyme has an active site with a specific shape. The substrate fits into this active site like a key fits into a lock. When the substrate binds to the enzyme, an enzyme-substrate complex forms. The enzyme then converts the substrate into products.



Factors that affect enzyme activity

1. Temperature: Too high temperatures cause enzymes to denature.
Too low temperatures slow molecular movements - reduced reaction rate

2. pH: Extreme pH level can alter the active site, reducing activity.
Each enzyme has an optimum pH (e.g. pepsin in stomach works best at pH-2).

3. Substrate Concentration: Increasing substrate concentration increases activity until all enzymes become saturated.

Beyond saturation, rate levels off.

4. Presence of Activators: Certain molecules increase enzyme activity by altering enzyme structure.

(C)

Renewable Energy Resources

Non-Renewable Energy Resources

(i) Energy that comes from natural resources that replenished themselves continuously or within a short period, are called renewable energy resources.

(ii) Solar, Wind, hydro, geothermal, biomass are examples of renewable energy.

(iii) It's a sustainable and long-lasting. It has low environmental impacts.

(i) Energy that comes from sources that do not replenish within a human life

(ii) Coal, oil, natural gas, nuclear fuels are examples of non-renewable energy.

(iii) It has limited supply. It will eventually run out. It causes higher environmental impacts like pollution, greenhouse gases.

Wind Energy as Sustainable Source for Future Generation

Wind energy is widely considered a ^{highly} sustainable energy resource because it is renewable and it has low environmental impacts.

It is abundant and widely available. It supports long-term energy security as fossil fuels decline, wind energy can help meet future energy demands. So it is sustainable source of energy for future generation.

(d) Dengue Fever

Dengue fever is a viral illness spread through mosquito bite.

Vector responsible for its transmission

Aedes mosquito, mainly Aedes aegypti and Aedes albopictus which transmit the dengue virus through their bites.

Symptoms

High fever, headache, muscle joint pain, nausea, vomiting and rash.

Preventive measures

- Use mosquito repellents
- Wear protective clothing
- Use mosquito net
- Eliminate standing water resources where mosquito breeds.