Dos 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 flowcharts and diagrams wherever they add clarity.
4. Neatness matters — keep your handwriting clean, 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.

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

Q.6

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

has a particular job that contributes to the cell's overall function. Thus, cells form organelles to maintain its homeostasis.
Some reasons are given below

a) **Seperation of processes**

Each organelle plays a separate and unique function in its compartment. It is not possible for a single organelle to play roles of multiple organelles. For example

i) Chlorophyll plays a function of Photosynthesis
ii) Ribosomes play a function of protein synthesis
iii) Mitochondria plays a function of storage of ATP (adenosine tri-phosphate).

b) **Specific environment for specific organelle**

Each organelle need specific environment to play its function. It needs specific PH, ion concentration, and enzyme.
For example: Lysosomes are acidic and Cytosol is neutral. This is

the reason cell forms different organelles and separate them in order to avoid any chemical reaction inside the cell.

Cells also form organelles to fullfil its need like:

i) Need for protection
↳ Lysosome and peroxisomes protect cell from harmfull enzymes and toxic-by-products.

ii) Need for energy production
↳ Mitochondia (in animal cells)
↳ chlorophyll (in plant cells)

iii) Need for Digestion and storage
↳ Lysosome and vacoules

iv) Need for Synthesis and Transport
↳ Ribosome, ER and Golgi apparatus

v) Need for genetic control
↳ Nucleus and DNA

vi) Need for structural support and shape
↳ cell wall, cell membranes and cytoskeleton

vii) Need for production
↳ centriol, and nucleus.

3) Mitochondria In a human Cell

Mitochondria is a double -

membrane bounded organelle found in almost all eukaryotic cells, including human cells. They are often called as the "power house of the cell" because they generate Adenosine triphosphate (ATP), the primary energy currency of the cell.

a) Structure of the mitochondria

Mitochondria is a double-membrane structure, divided into

i) outer membrane

ii) Inner membrane
- folded into structures called cristae

iii) Matrix
- It is the fluid inside the mitochondria contains enzymes, mitochondrial DNA and ribosomes.

b) Functions Of Mitochondria

The primary function of mitochondria is cellular respiration, which converts nutrients into usable energy (ATP).

c) Unique feature

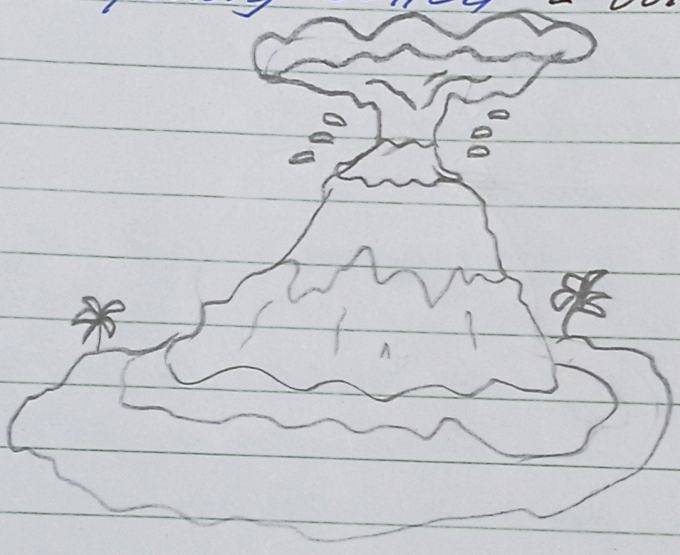
Mitochondria has its own circular

DNA, inherited maternally and can replicate independently.

b) State some of the merits and demerits of volcanic eruption.

Volcanic Eruption

Volcanic eruption is a natural process which expelles magma (molten rock), gases and ashes from beneath the Earth's crust through an opening called a volcano.



Merits of volcanic Eruption

Though volcanic eruptions are destructives they also have several benefits for the environment and humans.

Fertile Soil Formation

Lava and Ash emit-

form minerals like potassium, phosphorous and iron, which enrich the soil.

Example → volcanic soil around Mount vesuvius in Italy is highly fertile

formation of new land

Volcanic activity can create a new island and landforms.

Example: The Hawaiian Islands

Source of Geothermal Energy

Heat from volcanoes is used to generate geothermal power, a clean and renewable energy.

Example: Iceland.

Along with above, there are also othe merits like mineral resources and tourist attraction

Demerits of volcanic Eruption

Despite their benefits, volcanic eruptions can cause severe destruction and loss of life.

Loss of life and property

Explosive eruptions can destroy entire towns and cause massive casualties.

Air pollution

Explosive eruptions cause volcanic ash and gases like sulphur dioxide pollute air and can cause acid rain and respiratory diseases.

Economic Losses

Agricultural lands, industries, and infrastructure are damaged causing long-term economic setbacks.

Along with above there are also other demerits like destruction of vegetation and wildlife to climate change.

c) What is dengue? Discuss symptomalogy, causative agents and remedies.

Dengue

Dengue is a viral disease transmitted to humans through the bite of infected mosquito. It is caused by four dengue viruses spread by the Aedes aegypti mosquito.

Symptomalogy (symptoms)

Dengue fever causes a high fever of 104 degrees Fernenheit (40 degree celsius) and any of the following signs and symptoms.

Headache
Muscle, bone or joint pain
Nausea
vomiting
Pain behind the eyes
Swollen glands
Rash

Sometimes, the symptoms are very mild and mistaken

for minor disease like flu and other infections. Severe dengue happens when blood vessels become damaged and leaky, drops in the number of platelets.

Severe Dengue symptoms

→ Severe stomach pain
→ Persistent vomiting
→ Bleeding from gums or nose
→ blood in urine, stool or vomit
→ bleeding under skin, which might
→ look bruising
→ Fatigue
→ restlessness

Causative Agents

Dengue is caused by the Dengue virus (DENV).

There are four distinct but related serotypes of the dengue virus.

i) DENV-1
ii) DENV-2
iii) DENV-3
iv) DENV-4

Remedies

→ Prevent dehydration by drinking

of fluids (ORS, water, soups)
→ Use paracetamol to reduce fever and pain
→ Hospitalization for severe dengue.
→ Empty or cover water containers
→ use mosquito repellent and nets
→ community fumigation programs
→ vaccination
→ spread awarness
→ clean environment
→ stay away from flood water

Q#04

a) Write a note on plant kingdom "Chlorophy."

Chlorophyll

Chlorophyll is a green-pigment found mainly in the chloroplast of plants, algae, and some bacteria.

It plays a vital role in the process of photosynthesis, which enables plants to convert sunlight into chemical energy.

Chemical nature of chlorophyll

Chlorophyll is an organic compound containing Carbon, hydrogen, oxygen, nitrogen and magnesium

Types of chlorophyll

There are several types of chlorophyll, but the most common are:

→ Chlorophyll a - Found in all green plants

→ Chlorophyll b - Found in higher plants.

→ Chlorophyll c, d, and e
↳ Found in some algae.

Functions of chlorophyll

Absorption of light Energy

Chlorophyll absorbs light mainly in the blue and red regions of the spectrum and reflects green energy, which gives plants their color

Photosynthesis

It helps convert light energy into chemical energy by synthesizing glucose and from Carbondioxide (CO_2) and water (H_2O)

$$6CO_2 + 6H_2O \xrightarrow[\text{chlorophyll}]{\text{Sun light}} C_6H_{12}O_6 + 6O_2$$

Oxygen Production

During photosynthesis, it contributes to the release of oxygen as a by-product.

Significance of Chlorophyll

→ Chlorophyll is essential for plant growth and energy production
→ It is the basis for the food chains, as plant produce food for all living organisms
→ It helps maintain the balance oxygen and carbon dioxide in the atmosphere.

b) Describe role of ribosomes in protein synthesis

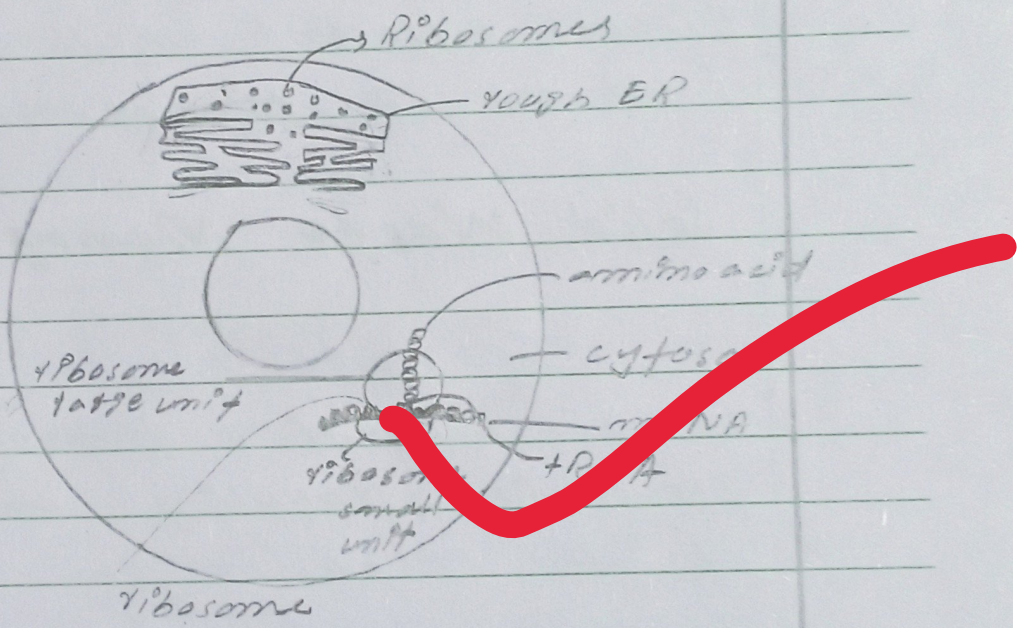
Ribosome

Ribosomes are small, complex molecular machines found in living cells. They play central role in protein synthesis, a process known as translation. Their main function is to read genetic code carried by messenger RNA (mRNA) and assemble amino acids in to a specific sequence to form a protein.

It is called as a protein factories of the cells.

Role of Ribosomes in protein synthesis

Ribosomes contain both protein and RNA and are structurally composed of two subunits. Both eukaryotic and prokaryotic ribosomes act like protein synthesis factories. Ribosomes located in the cytosol and rough endoplasmic reticulum maybe used for protein synthesis.



Ribosome (site of protein synthesis)

i) Transcription

tRNA makes a copy of its genetic code in the form of mRNA

ii) mRNA moves to Ribosome
iii) Translation
↳ The ribosome reads the codons on mRNA
iv) tRNA brings amino acids
↳ Each tRNA carries a specific amino acid
v) Peptide bond formation
↳ The ribosome joins amino acids through peptide bond
vi) Chain elongation
vii) Termination

c) Discuss different methods of Solid Waste Management

Solid Waste Management

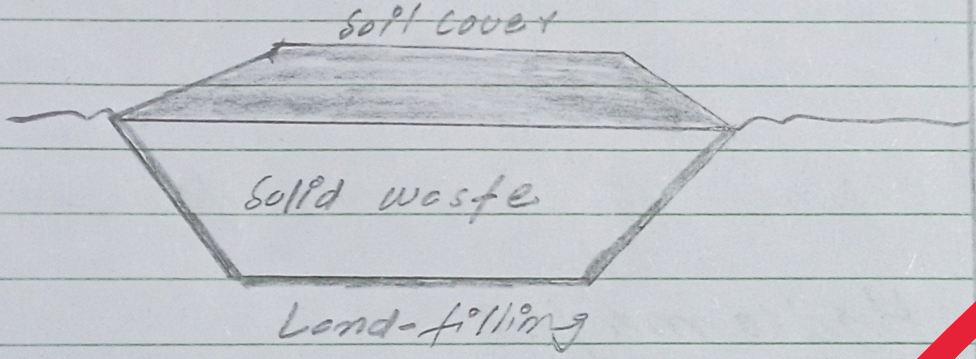
Solid waste management refers to the collection, transportation, processing, recycling, and disposal of solid waste in an environmentally sound and economically sustainable manner. Its main goal to reduce the harmful effects of waste on human health, environment and aesthetics.

Different Methods of Solid Waste Management

There are many methods of solid waste management some of them are discussed below.

Land-filling

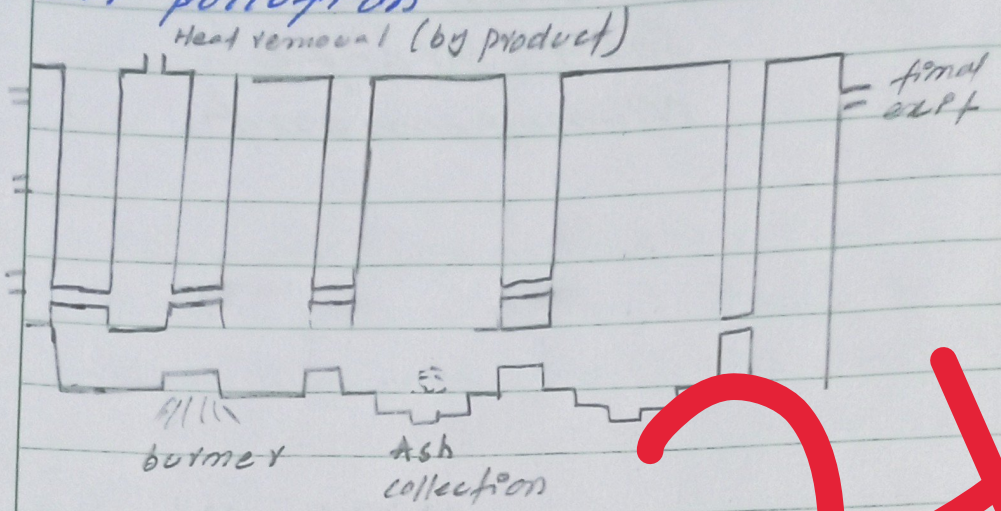
waste is buried in designated area and covered with soil. It is simple and economical method. But it requires large land are and can cause methane emission



Incineration (combustion method)

Burning of solid waste at high temprafures to reduce volume and generate energy (waste-to-energy). It needs high cost and causes

air pollution



It is a burning of waste by using the incenerators.

Composting

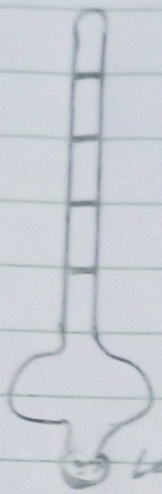
Decomposition of organic waste (food, yard waste, etc) by microorganisms into compost (humus like material.

d) Define the following terms.

Hydrometer

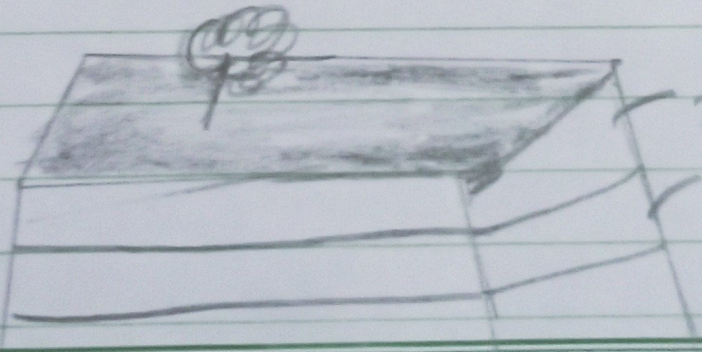
It is an instrument used to measure the relative density (specific gravity) of liquids that is, the ratio of the density of a liquid to the density of water.

used to measure the density of milk, alcohol, battery acids or saltwater.



Epicenter

The epicenter is the point on the Earth's surface directly above the focus (hypocenter) of an earthquake. It is the surface point where the earthquake's shaking is usually strongest and is often used to describe the location of the earthquake.



Eyewall of cyclone

It is the ring of tall, dense clouds that surround the eye (the calm center) of the cyclone. It contains the strongest winds.

Deep focus

A deep-focus earthquake is an earthquake that occurs deep beneath the earth

light year

It is a unit of distance that light travels in one year in a vaccume speed of about 300,000 km/s.