

Dos and Don'ts for the General Science & Ability Paper

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2. What are the main components of a cell, and how do they work together to maintain cellular functions? Discuss the differences between prokaryotic and eukaryotic cells. How do cells respond to external stimuli and maintain homeostasis?

Main Components of a Cell and their Functions:

Cells are the basic units of life. All living organisms are made of cells, and each cell has specific parts that perform different jobs.

Cell Membrane

- it is the thin outer covering of cell.
- Works like a security gate - controls what enters (like food & oxygen) and what leaves (like waste).

Cytoplasm:

- A jelly-like fluid inside the cell.
- Provides a place for chemical reactions and hold organelles.

Mitochondria:

- Known as the power house of the cell.
- Breaks down food and releases energy in the form of ATP.

Nucleus (only in eukaryotes)

- The control center of the cell.
- Contains DNA (genetic material) that gives instructions for making proteins and running cell activities.

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.

Good luck for CSS 2026 — you're going to ace it, in sha Allah! 🌟

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Ribosomes:

- Small structure that make proteins, which are needed for growth and repair.

Endoplasmic Reticulum ER:

- Two types: Rough ER (with ribosomes) and Smooth ER (without ribosomes)
- Rough ER: helps in protein production.
- Smooth ER: makes fats and detoxifies harmful chemicals.

Golgi Apparatus:

- Works like a post office - modifies, packs, and delivers proteins and other materials to where they are needed.

Lysosomes:

- The cleaning system of the cell.
- Breaks down waste, old organelles, and harmful substances.

Vacuoles:

- Storage for water, nutrients, and waste.
- Plant cells have large vacuoles, while animal cells have small ones.

Cell Wall:

Provides extra protection and support.

Chloroplasts: (only in plant cell)

- Contain green pigment (chlorophyll).
- Make food for plants by photosynthesis (using sunlight, water, and carbon dioxide).

Prokaryotic vs. Eukaryotic Cells:

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Feature	Prokaryotic cells (Bacteria, Archaea)	Eukaryotic cells (plants, animals, fungi)
Nucleus	- No true nucleus, DNA floats in cytoplasm	- Has a true nucleus and DNA inside
Size	- Small (1-10 μm)	- Large (10-100 μm)
Organelles	- Few, simple (no ER, no mitochondria)	- Many complex organelles (ER, Golgi, mitochondria)
Examples	- Bacteria, Cyanobacteria	- Humans, plants, fungi

How cell Respond to External Stimuli and Maintain Homeostasis:

Response to Stimuli:

- Cells can sense changes in their environment (temperature, chemical, light, pressure)-
- Examples: White blood cells move toward infection, plant cells respond to light by bending leaves-

Homeostasis:

- Cells maintain a stable internal environment to survive
- Cell membrane controls balance of water, salts, and nutrients-
- Examples: if too much water enters, cell absorbs it, if cell dries out, it tries to take in more water

b How do mobile phones work, and what are the key technologies that enable mobile communication?

How mobile phone work:

Mobile phones use radio waves to send and receive signals through cell towers. These towers connect calls, messages, and internet access across a network. Mobile phones also use Wi-Fi, Bluetooth, GPS, and 4G/5G networks to function.

Key technologies:

- Cell Tower and Base Stations
- Radio waves (Spectrum)
- SIM Card
- Mobile Networks (2G, 3G, 4G, 5G)
- Satellites and GPS
- Wi-Fi and Bluetooth
- Smart phone Operating Systems (Android, iOS)

Advantages:

- Communication
- Productivity
- Emergency use
- Entertainment
- Information Access

Disadvantages:

- Causes stress, anxiety and depression
- Reduces face-to-face interaction
- Privacy and data risks
- Affects eyesight and sleep

Impacts

Mobile phone have changed communication from slow letters / landlines to instant global connections. They also transformed how we learn, work

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and socialize, but need responsible use to avoid negative effects-

- Salman purchased 20 dozens of eggs at the rate of RS 375 per dozen. He sold each one of them at the rate RS 33. What was his percentage profit?

Cost of 1 dozen (12 eggs) Rs 375
So, cost of 1 egg = $\frac{375}{12}$ 31.25 rs (C.P.)

S.P Salman sold 1 egg = Rs. 33

Profit on 1 egg
S.P - C.P = 33 - 31.25
= 1.75 rs.

$$\text{Profit \%} = \frac{\text{Profit}}{\text{C.P}} \times 100$$

$$= \frac{1.75}{31.25} \times 100$$

$$= 5.6\%$$

$$\text{Profit Percentage} = 5.6\%$$