Answer No 1

(PART) ~~B~~ A

1. Main components of a Cell and their Functions.

Cells are the basic structural and functional units of life. Their main components include:

1. Cell Membrane (Plasma Membrane)
   - Semi-permeable
   - Phospholipid bilayer with Proteins.
   - Control entry/exist of substances.
   - and recognition.

2. Cytoplasm
   - Jelly-like fluid (cytosol + organelles)
   - Site for most biochemical reactions.

3. Nucleus (in eukaryotes)
   - Contains DNA (genetic material)
   - Controls cells activities through gene expressions.

4. Ribosomes:
   - Small structures that synthesis proteins
   - Found free in cytoplasm or attached

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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 135 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! 🌟

5. Endoplasmic Reticulum (ER)
Rough ER: has ribosomes → protein synthesis and transp
Smoth ER: lipid ~~system~~ synthesis, detoxification,
Calcium Storage.

6. Goligi Appratus
Modifies, sorts, and packages proteins and liquids into vesicles for secretion or internal use

7. Mitochondia (Powerhouse for the cell)
Produce ATP throug cellular respiration.

8. Lysosomes (in animals cells)
Contains digestive enzymes to break down Waste and foreign particles.

. Chloroplasts (in plant cells)
Site of photosynthesis, converting solar energy into ~~glucose~~. glucose.

Cytoskeleton
Site of Protein filament (microtubles, microfilaments intermediate filaments) Provides shape, movement and transport of materials.

Prokaryotic Vs Eukaryotic Cells

Nucleus: Prokaryotic lack a true nucleus; DNA sit in nucleoid. Eukaryotic have a true nucleus with nuclear envelope.

Size: Prokaryotic small (1-10μm), Eukaryotic larger (10-100μm)

Organelles: Prokaryotic lack membrance-bound organelles; Eukaryotes possess many (ER, mitochondria, & Golgi).

Division: Prokaryotes (70s) eukaryotes (80s)

Ribosomes: Prokaryotes (70s) eukaryotes (80s)

Cells' Response to External Stimuli

- Detect signal via memberance receptors
- Use signal transduction pathways.
- Respond by altering gen, expression, metabolism movement (Chemotaxis) or secretion (e.g) Insulin,

Homeostasis in Cells

Maintain stable internal enviroment through.

Transport: Diffusion, ~~or~~ osmosis & active transport

Feedback loops: negative and postive

pH and temperature control: enzymes, buffers.

Waste removal: lysosomes exocytosis

(B) PART (Q: 2)

1. How Mobile Phone work

Mobile phones, change voice/data into ~~sing~~ Signals. These Signals travel through towers and Satellites. The receivers phone converts them back to sound or text.

2. Key Technologies:

Mobile networks (2G, 5G) carry calls and internet. SIM Cards, GPS, Wifi, and Bluetooth make Communication easy. Smartphone apps allow multiple ~~servers~~ Services in one device.

3. Advantages

We can talk, text, and video call instantly.
Information and education are available anytime.
They help in business, banking and emergencies.

4. Disadvantages:

To much use reduces real social contact.
It can cause stress, addiction, and sleep problems.
Privacy risks and distraction are also common.

5. Impact on Communication.

Phones change letters into instant messaging. They connect people worldwide through social media.
Access to knowledge and digital economy has become easier.

C) (Q:2)

Layers of Earth

The Earth has three main layers: Crust, mantle, and core. The Crust is the thin outer layer where we live, the mantle moves slowly causing earthquakes and volcanoes, and the core is very hot driving Earth's energy. They interact through heat and pressure; shapping mountains, oceans, and landforms.

Excellent!

The Water Cycle

Water moves in a cycle: Evaporation, Condensation, and Precipitation. It keeps water Circulation between oceans, air, and land. This cycle provides free water, supports plants, animals and human life.

3. Human Impact on Earth.

Humans cut forests, pollute air and water, and overuse land. These ~~activity~~ activities damage and reduce biodiversity. Nature resources like soil, water, and minerals are being depleted.

(PART 4)

1. Main Sources of Air Pollution

Air pollution comes from ~~Vechi~~ vehicles, industries, burning fossil fuel, and deforestation. Natural sources include dust storms, wildfires, and volcanic eruptions. These release harmful gases and particles into the atmosphere.

2. Effect of Air Pollution

It causes breathing problems, heart diseases, and cancer in humans. Air pollution damages crops, forests, and water bodies. It also contributes to climate change and acid rain.

5. Primary Vs Secondary Pollutants.

Primary pollutants are directly released (e.g CO, SO_2 NO_x from vehicles and factories.
Secordary pollutants are from in the air by chemical reactions (e.g) Ozone, smog, acid rain.
Both types harm health and environment.

Reducing Air Pollution

Individual can use X public transport, save energy, and plant trees. Collective action includes clean energy, strict laws, and eco-friendly industries. Global cooperation is needed to fight climate change and protect ecosystems.

Q:3 (PART A)

1. Big Band theory

The BigBaned theory says the universe began about 13.8 billion years ago. It started from a tiny; hot, dense point that expanded rapidly. Galaxies, stars, and planets ~~fron~~ formed as the universe cooled and spread out.

2. Role of Dark Matter and Dark Energy

Dark matter is invisible matter that gives gravity to hold glaxies ~~to'o~~ together.
Dark energy is a mysterious force pushing the universe to expand faster. Both are unseen but make up most of the universe.

3. Evidence for the BigBand.

~~Con~~ Cosmic Microwave Background Radiation: Leftover heat from the early universe.
Redshift of Galaxies: galaxies moving away shows expansion.
Abundance of light Elements: hydrogen and helium match prediction.

Q:3 (PART B)

1. What is Galaxy?

A galaxy is the gravitational bound system. It is a massive system of stars, gas, dust, and dark matter. They are held togather by gravity. Galaxies can contain billions of stars and planetary systems.

2. Classification of Galaxies?

Galaxies are mainly classified as a spiral, elliptical and irregular. Spiral galaxies have arms, elliptical are round or oval, and Irregular have no shape. This classification was given by Edwin Hubble.

3. Structure and Composition of the Milky Way.

The Milkway is a spiral galaxy with a central bulge, disk, and halo. It contains stars planets, nebulae, gas, dust, and dark matter. Our Solar System lies in one of its spiral arms Called the Orion Arm.

4. Formation and Evolution Galaxies.
Galaxies form from clouds of gas collapsing under ~~gavi~~ gravity. Over time, they grow by merging with other galaxies. Star formation, supernovae and black holes shape their evolution.

(Q:3 PART C)

1. What is Remote Sensing?
Romote Sensing is the Science of collecting information about Earth from a distance. It uses Sensors on Satellites, aircraft, or drones. This helps Study land, water, whether, and enviroment without direct Contact.

2. Types of Remote Sensing?
Satellites Imaging: Captures large-scale Earth images from space.
Aerial Photography: Takes pictures from planes or drones ~~fro~~ for detailed survey. ~~Athey~~ other types include radar and thermal sensing for ~~Speaci~~ Special Observations.

Uses in Monitoring

Romote Sensing tracks deforestation, urban growth and Climate change. It monitors, natural disasters like floods, eq earthquakes, and wildfires. This supports planning, disaster management, and environmented protection.

Q:3 (Part D)

Main Functions of Human Brains

The brain Controls thinking, memory, emotions, and decision-making. It regulatory body functions like breathing, heartbeat, and movement. It also processes information from the sense.

Brain Regions Working togather

The Cerebrum handles throught, learning, and senses. The Cerebrum Controls balance and Coordination, while the brainstem regulates vital funtions. All regions communicate through neural networks to keep the body working.

3. Factors Affecting Brain Function.

Sleep- improves memory and focus, while lack of it causes confusion.

Nutrition- (vitamins, Omega 3) glucose keeps the brain active and healthy.

Stress harm brain cells- reduces learning, and effects mental health.

9:4 (PART A)

1. What are fiber optics and How they Work.

Fiber optics are thin glass or plastic strands that carry light signals. They use the principle of total internal reflection to guide light. Data is transmitted as pulses of light over long distances.

2. Advantages Over Copper Wires

fiber optics tranmit data faster and with less loss.

They are lighter, thinner, and immune to electromagnetic. interfrence.

They also carry more data over longer distances.

High-Speed Data Transmission

Light travels extremely fast, allowing quick transfer of information. Multiple signals can be sent at once using wavelength division. This makes fiber optical ideal for internet, telecommunication and medical use.

Q:4 (PART B)

1. Causes and Effect of Earthquakes.

Earthquakes happen due to movement of tectonic plates alone faults. They release energy suddenly, shaking the ground. Effect include destruction of buildings, ~~tsuman~~ tsunamis, injuries, and loss of life.

2. Types of Seismic Waves and Measurement

P-Waves (fast, compressional), S-Waves (Slower, side-to-side) and Surface waves (Cause most damage). Seismic Waves are recorded by seismographs. Earthquake strength is measured by the Richter Scale and Moment Magnitude Scale.

3. Reducing Earthquake Impact.

- Earthquake-resistance buildings absorb shock and reducing collaspe. ~~Prepa~~
- Preparedness like drills, emergency kits, and awareness Saves lives.
- Early warming systems help evacuate and minimize dea damage.

Q:4 (PART C)

1. What is a Balanced Diet and it importance.

A balanced diet provides the right amounts of Carbohydrates, proteins, fats, vitamins, and minerals. It supplies energy, support growth, and strengthens immunity, it is essential for ~~maintaing~~ maintaining overall health and body functions.

Address all parts properly!

- Role of Macronutrient and Micronutrient.

Macronutrient (Carbs, proteins, fats) give energy, build muscles and regulate body processes.
Micronutrient (Vitamins, minerals,) support immunity bones, and metabolism. Both are needed in proper proportions for a healthy body.

- Preventing Chronic Diseases

A balanced diet reduces obesity, diabetes, and heart disease risk. It prevents deficiencies like anemia and weak bones. Healthy eating habits improve long-term physical and mental health.

Q:4 (Part D)

1. ## Main Sources of Water Pollution

Major Sources are industrial Waste, Sewage, agricultural runoff, and plastic dumping. Oil Spills and Chemicals from factories also pollute rivers and oceans. Natural Sources include floods and soil erosion.

Effects on Human Health and Environment

Polluted water spreads diseases like cholera, diarrhea, and typhoid. It kills fish, reduces biodiversity, and damage ecosystems. Toxic chemicals enter the food chain, harming both humans and animals.

Answer properly to get more marks

Prevention and Control.

Communities can treat sewage before releasing it into rivers. Reduce plastic use, control industrial wet waste, and promote clean water programs. Pt Public awareness and laws help keep water safe and healthy.

Q:5 (Part A)

59, 61, 67 Since (59+61+67) = 187

(PART B)

$x + 17 = \frac{60}{x}$ ~~= x~~

multiply $x^2 + 17x = 60$

Rearrange $x^2 + 17x - 60 = 0$

Solve $x = 3$ postive (Answer = 3)

(PART C)

Initial = 17000 → Final = 262500.

Growth factor = 262500 ÷ 175000 = 1.5

Annual growth = $(1.5)^{1/10} - 1 = 0.0414 \times 100 = 4.14\%$

(PART D)

Cost per dozen = 375

for 20 dozen → Cost = 375 x 20 = 7500

Total eggs = 20 x 12 = 240

Selling price = 240 x 33 = 7920

Profit - 7920 - 7500 = 420

(420 ÷ 7500) x 100 = 5.6% Ans.