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EDUCATION-NEWS CONSULT – DODOWA, ACCRA
2026 BECE – MOCK 1 EXAMINATION (AUGUST 2025)
MARKING SCHEME FOR SCIENCE

Question 2

a. **i. Differences between a simple machine and a complex machine:**

- A simple machine is made up of only one or a few parts that perform a single function, ***while*** a complex machine is made up of two or more simple machines working together to perform multiple or more complicated tasks.
- Simple machines are usually operated manually and do not require external power sources. In contrast, complex machines often require electricity, fuel, or engines to function.
- Simple machines are easy to use, maintain, and repair, **whereas** complex machines often require skilled technicians and specialized tools for maintenance and repair. ***3 marks @ 1 mark each***

ii. Examples each of simple and complex machines:

- **Simple machines**:Lever, Pulley, Wheel and axle, Inclined plane
- **Complex machines:** Car, Bicycle, Sewing machine, Bulldozer ***4 marks @ 1 mark each***

b.How sulfur can be separated from a mixture of powdered sulfur and iron filings:

To separate powdered sulfur from iron filings, magnetic separation is used. Spread the mixture on a sheet of paper. A magnet is passed over or through the mixture. The iron filings are attracted to the magnet and stick to it, while the sulfur remains behind. ***5 marks***

c.i. Meaning of the term seed bed.

A seed bed is a prepared section of soil that has been loosened, leveled, and made suitable for planting seeds to ensure better germination and healthy early growth of crops by providing good soil structure, adequate aeration, and moisture retention. ***3 marks***

ii. Three main types of seed beds used in crop cultivation:

- Flat seed bed
- Raised seed bed
- Sunken seed bed ***3 marks @ 1 mark each***

d.The 3R principle in sustainable waste management:

- **Reduce**: Lower the amount of waste produced by consuming less and choosing products with minimal packaging.
- **Reuse**: Use items more than once or repurpose them for different functions instead of throwing them away.
- **Recycle**: Process waste materials to make them usable again for the production of new items, reducing the need for raw materials. ***3 marks @ 1 mark each***

Question 3

a. i. Atom of Element V (Atomic Number = 17, Mass Number = 35)

Number of Subatomic Particles:

Protons = 17 (same as the atomic number) ***1 mark***

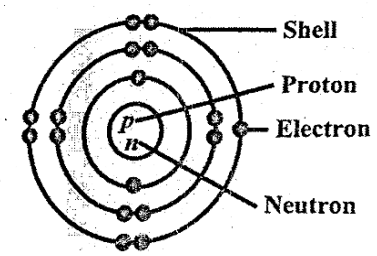
Electrons = 17 (same as protons in a neutral atom) ***1 mark***

Neutrons = Mass number – Atomic number = 35 – 17 = 18 ***1 mark***

ii. Electronic Configuration Diagram:

The atom is chlorine (Cl).

Electronic configuration = 2, 8, 7



4 marks

b. i. Human activities that interfere with the carbon cycle:

- Burning of fossil fuels (coal, oil, and natural gas)
- Deforestation and land clearing
- Industrial emissions and cement production
- Agricultural practices, especially livestock farming
- Waste decomposition in landfills releasing methane. ***2 marks @ 1 mark each for any 2***

ii. Environmental effects of carbon cycle disruption:

- Global warming due to increased greenhouse gases
- Ocean acidification caused by excess CO_2 absorption
- Climate change, including extreme weather events
- Melting of polar ice caps and rising sea levels. ***2 marks @ 1 mark each for any 2***

c. Capacitor Charging and Discharging

A capacitor stores electrical energy by accumulating opposite charges on two conductive plates separated by an insulator (dielectric).

***Charging*:** When connected to a power source, electrons build up on one plate, while the other becomes positively charged, creating an electric field. This stored energy can be maintained until the circuit is opened or discharged.

Discharging: When the capacitor is connected to a load, the stored energy is released as the electrons flow from the negative plate to the positive plate, allowing current to pass through the circuit temporarily. ***3 marks***

d. i. Differences between igneous and sedimentary rocks:

Igneous Rocks	**Sedimentary Rocks**
• Formed from cooled molten magma	Formed from the compaction of sediments
• Usually hard and crystalline	Usually soft and layered
• Rarely contain fossils	Commonly contain fossils
• Found deep underground or in volcanoes	Found in river beds, oceans, and deserts

3 marks @ 1 mark each for any 3

ii. Formation of Metamorphic Rocks:

Metamorphic rocks are formed when existing igneous or sedimentary rocks are subjected to high pressure, high temperature, or both, deep within the Earth. These conditions cause physical and chemical changes in the rock's structure without melting it, resulting in a denser, more compact rock with new mineral formations (e.g., shale transforming into slate). ***3 marks***

Question 4

a. Reasons for Specific Agricultural Practices

i. Why is Centrosema often grown in oil palm plantations?

Centrosema is a leguminous cover crop that helps to fix atmospheric nitrogen into the soil, enriching soil fertility. Additionally, it suppresses weed growth, prevents soil erosion, and improves soil moisture retention under oil palm trees. ***2 marks***

ii. Why is a farmland infected with witchweed usually replanted with peanut?

Witchweed is a parasitic plant that affects cereal crops. Peanuts, being legumes, are non-hosts to witchweed. Replanting with peanuts disrupts the life cycle of witchweed, eventually reducing or eliminating its population from the soil. ***2 marks***

b. i. Difference Between Soil Texture and Soil Structure

Soil Texture refers to the relative proportion of different-sized mineral particles (sand, silt, and clay) in a soil. It determines how the soil feels and how it retains water and nutrients.

Soil Structure refers to the arrangement of soil particles into aggregates or clusters. It affects aeration, drainage, and root penetration in the soil.

4 marks @ 2 marks each

ii. **Importance of Soil Structure**

- Improves water infiltration and drainage
- Enhances root penetration and growth
- Promotes air circulation (soil aeration)
- Reduces soil erosion ***2 marks @ 1 mark each for any 2***

c. i. Ways in which plants and animals rely on each other for survival:

- Animals depend on plants for oxygen through photosynthesis.
- Plants rely on animals for pollination and seed dispersal.
- Animals obtain food (fruits, leaves, seeds) from plants.
- Plants benefit from the carbon dioxide released by animals during respiration.

2 marks @ 1 mark each for any 2

ii. Disadvantages of organic farming:

- Organic farming usually gives lower crop yields compared to conventional farming.
- It requires more labor and time for weed and pest control.
- Organic fertilizers may release nutrients slowly, affecting plant growth.
- Organic produce may have a shorter shelf life due to the absence of chemical preservatives.

3 marks @ 1 mark each for any 3

d. i. How electricity is produced from a dam:

Water is stored at a height in a dam. When released, the water flows down through large pipes (penstocks) and strikes the blades of turbines. The force of the moving water spins the turbines, which are connected to generators that convert the mechanical energy into electrical energy. ***3 marks***

ii. Energy transformations in hydroelectric power generation:

Potential energy -> Kinetic energy -> Mechanical energy -> Electrical energy ***2 marks***

Question 5

a. i. Properties of Magnetic Lines of Force

They always emerge from the north pole and enter the south pole of a magnet.
They never intersect or cross one another.
They are denser at the poles where the magnetic field is strongest.
They form closed loops, continuing inside the magnet from the south to the north pole.

3 marks @ 1 mark each for any 3

ii. Definition of Magnetic Field

A magnetic field is the region around a magnet where magnetic forces can be detected or felt. ***2 marks***

b. i. Definition of Electronic Configuration

Electronic configuration is the arrangement of electrons in the orbitals or energy levels (shells) of an atom.

2 marks

ii. Characteristics of Group 7 Elements (Halogens)

They are non-metals with high reactivity.
They exist as diatomic molecules (e.g., Cl_2, F_2).
They have seven electrons in their outermost shell.
They form salts when they react with metals. ***3 marks @ 1 mark each for any 3***

c. i. Three Forms of Roughages

Dry roughage
Fresh roughage
Silage ***3 marks @ 1 mark each***

ii. Macro Minerals Needed by Animals

- Calcium
- Phosphorus
- Sodium
- Potassium
- Magnesium ***2 marks @ 1 mark each for any 2***

d. i. Completed Table

Lack of	Deficiency disease
Vitamin C	***Scurvy***
Vitamin D	*Ricket*
Vitamin A	*Night blindness*

3 marks @ 1 mark each

ii. Functions of Fats in the Human Body

- Provide a concentrated source of energy
- Help in the absorption of fat-soluble vitamins (A, D, E, K)
- Provide insulation and maintain body temperature
- Protect internal organs by cushioning them ***2 marks @ 1 mark each for any 2***