



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL ASSESSMENT
GENERAL EDUCATION CERTIFICATE (GEC)**

2025 GRADE 9

Subject: Natural Sciences

Marks: 70

Duration: 2 hours

excluding 15 minutes reading time

This test consists of 31 pages excluding the cover page.



Instructions to the learner

1. Answer all the questions.
2. Write all the answers in the answer book.
3. Write your answers according to the instructions of each question.
4. All drawings must be done in pencil and labelled in blue or black ink.
5. Draw diagrams, flow charts or tables only when asked to do so.
6. The diagrams in this question paper are **not** necessarily drawn to scale.
7. Do **not** use graph paper.
8. You may use a non-programmable calculator where necessary.
9. Write neatly and legibly.

The test starts on the next page.



Do not turn the page until you are told to do so.

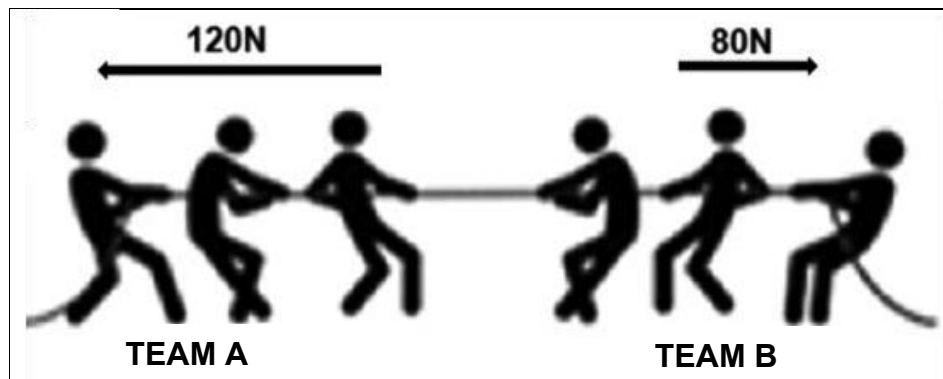
SECTION A

1. Which of the following defines a force? It is ...

- A not a push nor a pull exerted on an object.
- B a push or pull exerted on an object.
- C a form of energy.
- D a measurement of an object's weight.

(1)

2. The picture shows a 'Tug of War' game played by children. Team A exerted a force of 120 N to the left and Team B exerted a force of 80 N to the right on the rope.



Sourced from: <https://www.istockphoto.com>

What will be the final force?

- A 200 N to the right
- B 40 N to the left
- C 200 N to the left
- D 40 N to the right

(1)

3. Two similar objects are falling from the same height at the same time. One is on the Moon and the other one is on Earth.

How will the gravity of the Moon and the Earth affect the falling objects?

	Object on the Moon	Object on Earth
A	Float	Float
B	Fall faster	Fall slower
C	Fall slower	Fall faster
D	Fall faster	Fall faster

(1)

4. A learner places two magnets close together and notices that they repel each other.

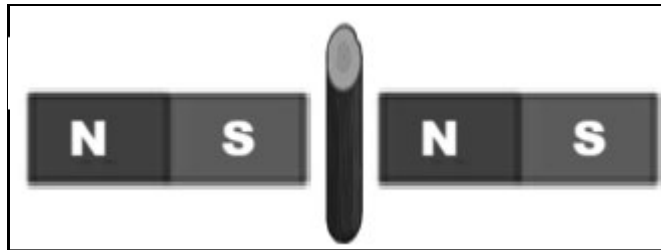
What does this tell us about the poles of the magnets?

- A The facing poles are not the same.
B One magnet is stronger than the other.
C The two facing poles are the same.
D The magnets are too weak to stick together.
- (1)

5. What type of energy do charged objects have?

- A Chemical energy
B Thermal energy
C Potential energy
D Kinetic energy
- (1)

6. Two magnets with opposite poles facing each other have a piece of wood between them.



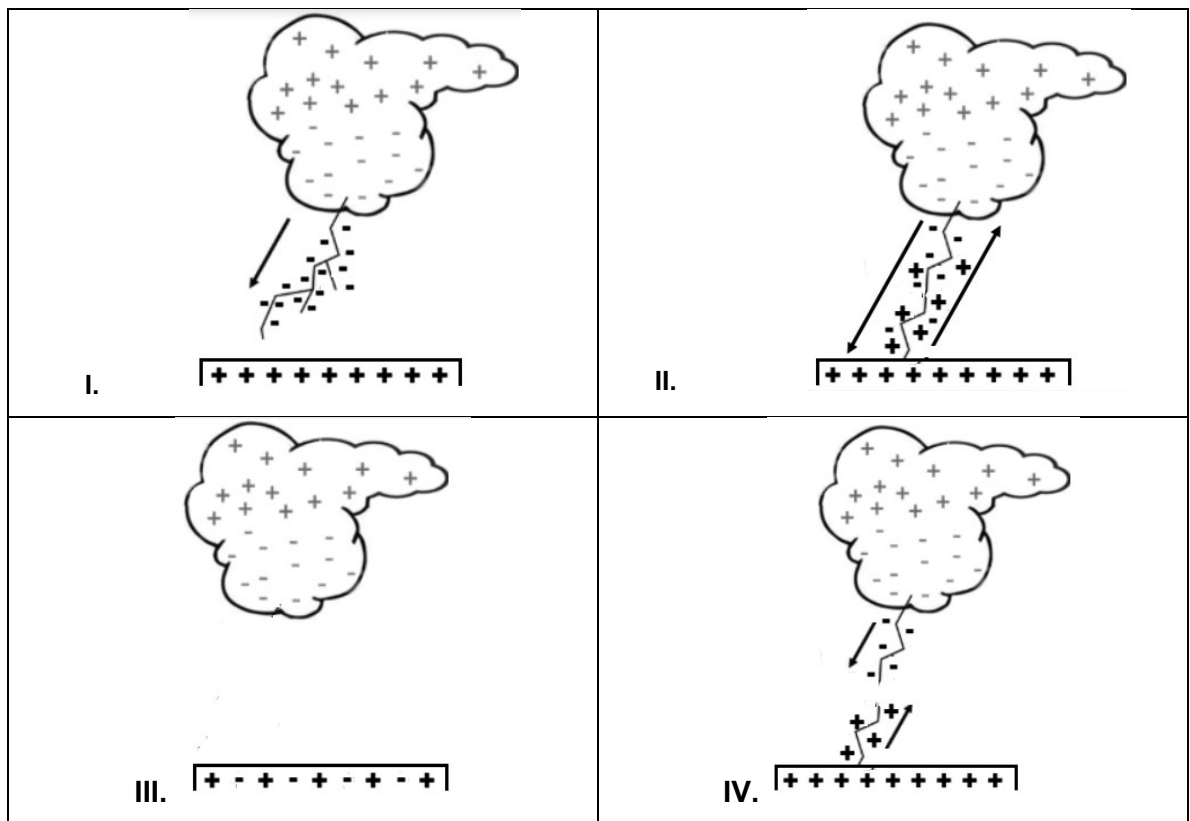
What will happen to the magnetic force between the two magnets?

Their magnetic force will ...

- A disappear because of the wood that is placed between them.
- B be weak, but they will still be attracted by force through the wood.
- C repel each other due to the wood that is separating them.
- D become stronger because of the wood between them.

(1)

7. Study the illustration of the formation of lightning below.

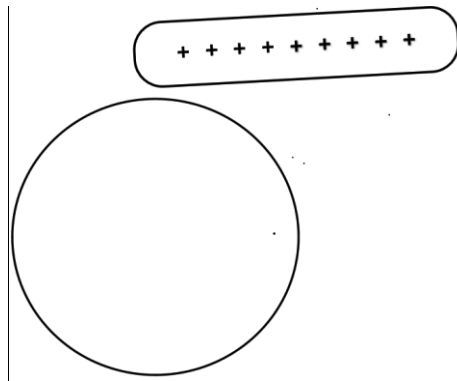


Arrange the above illustrations from the first to the last stage of the lightning formation.

- A I, III, IV and II
- B III, II, IV and I
- C III, I, IV and II
- D II, I, III and IV

(1)

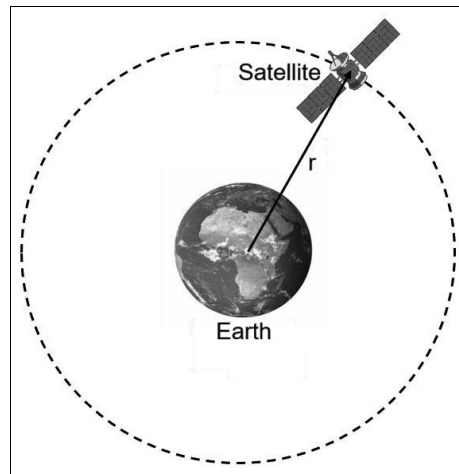
8. The diagram shows neutral and positively charged objects close to each other.



Explain what happens when a positively charged object is brought closer to a neutral object.

- A The neutral object becomes positively charged.
 - B Negative charges in the neutral object are attracted toward the positively charged object.
 - C The neutral object repels the positively charged object.
 - D The neutral object becomes negatively charged. (1)
9. Which of the following is the most effective safety precaution to minimise the risk of being struck by lightning?
- A Take shelter under a tall tree to stay dry
 - B Use an umbrella to cover your head
 - C Take shelter in a fully enclosed metal-roofed vehicle
 - D Run very fast to a nearby isolated shelter (1)

10. The diagram shows a satellite orbiting the Earth.



Source: <https://www.chegg.com>

What type of force is holding the satellite in its orbit?

- A Magnetic force
- B Gravitational force
- C Electrostatic force
- D Tension force

(1)

11. Which of the following is **not** a correct description of an electrical cell?

- A It converts chemical energy into electrical energy.
- B It consists of two electrodes and an electrolyte.
- C It requires an external power source to generate electricity.
- D It can be non-rechargeable or rechargeable.

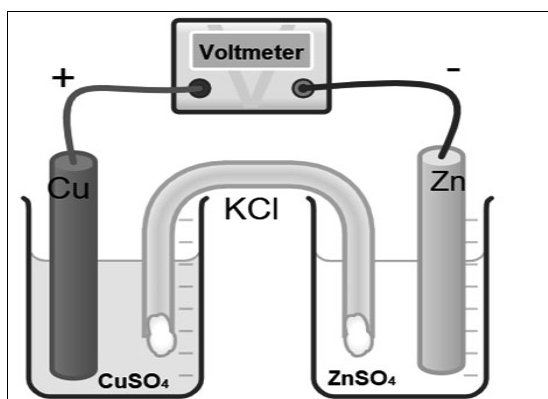
(1)

12. Which of the following explains why lemons can be used as electric cells?

Lemons ...

- A have a high potential difference between the two electrodes.
- B have a low resistance to electric current between two different electrodes.
- C contain a high concentration of copper ions between two different electrodes.
- D contain citric acid as an electrolyte between two different electrodes. (1)

13. The diagram shows a simple electrochemical cell. Study the diagram and answer the questions that follow.



Which part of the electrochemical cell containing an electrolyte is completing the circuit?

- A zinc electrode
- B copper electrode
- C salt bridge
- D voltmeter (1)

14. Which of the following best defines a resistor in an electrical circuit?

- A A source of electrical energy in a circuit
- B An instrument used to measure voltage in a circuit
- C A component that stops current flow in a circuit
- D A component that provides useful energy transfer (1)

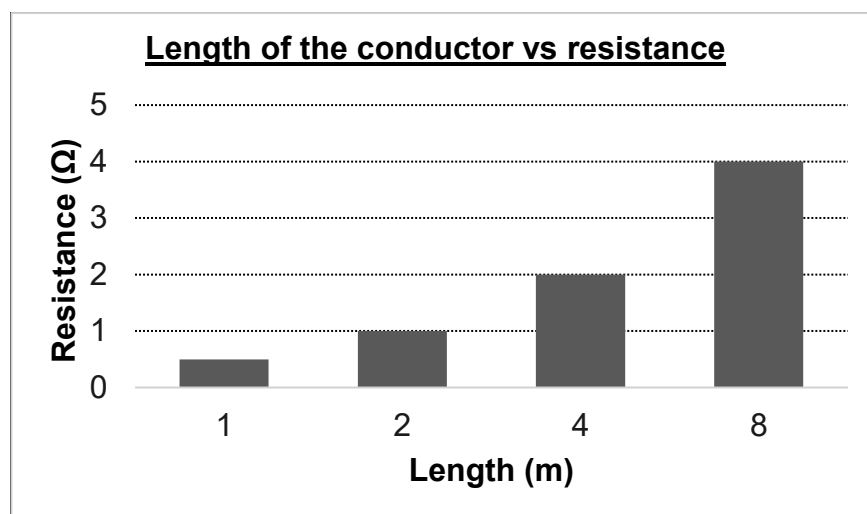
15. Learners performed an experiment to investigate the effect of the type of material and their resistance. Nichrome and copper wires of the same length and diameter were used. See the results in the table below.

TYPE OF MATERIAL	CURRENT (A)
Nichrome wire	0,4
Copper wire	0,8

According to the results ...

- A both wires have high resistance.
- B nichrome wire has high resistance.
- C nichrome wire has low resistance.
- D copper wire has high resistance. (1)

16. The graph shows resistance of a copper wire at different lengths.



What conclusion can be drawn from the graph about the relationship between the length of a conductor and its resistance?

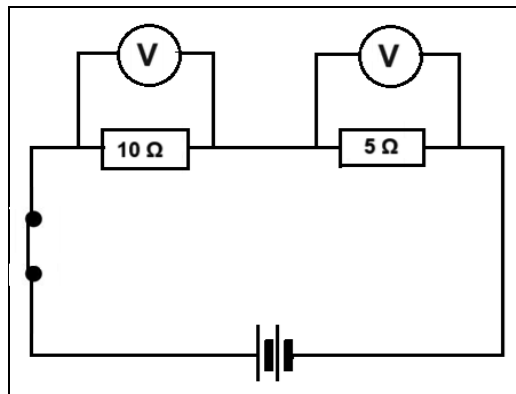
- A Resistance decreases as the length increases
- B Resistance remains constant regardless of the length
- C Resistance increases as the length increases
- D Resistance increases as the length decreases (1)

17. Which statement explains how temperature affects the resistance of a conductor?

- A As temperature increases, resistance decreases
- B Resistance increases as temperature increases
- C Resistance remains constant regardless of temperature changes in a conductor.
- D Higher temperature causes a conductor to become superconducting, eliminating resistance. (1)

18. What happens in a circuit when more resistors are added in a series connection?
Total resistance...
- A decreases while the current decreases.
 - B increases while the current decreases.
 - C decreases while the current increases.
 - D increases while the current remains constant. (1)
19. What happens to the potential difference when resistors are connected in series?
- A Potential difference across each resistor is different.
 - B Sum of the potential difference across each resistor is less than the total voltage.
 - C Current flowing through each resistor is affected by the potential difference across it.
 - D Sum of the potential differences across each resistor is equal to the voltage applied. (1)
20. Which of the following best describes a series circuit?
A circuit with ...
- A multiple paths for current to flow.
 - B only one path for current to flow.
 - C an open switch.
 - D at least two cells. (1)

21. The circuit diagram shows a series circuit with 10Ω and a 5Ω resistor.



How will the voltage be distributed in this circuit?

The voltage will be ...

- A higher across the 5Ω resistor.
- B the same across both resistors.
- C less across the 10Ω resistor.
- D higher across the 10Ω resistor.

(1)

22. Why is the lighting system in our homes usually connected in parallel?

To ...

- A ensure that the lighting connections are safe for use in our homes.
- B reduce energy consumption in our homes.
- C enable other lights to remain working when one bulb goes out.
- D ensure that the current is the same through all lights in our homes.

(1)

23. The picture shows a battery powered quad bike toy. It has a motor that allows the wheels to turn. When the motor stops functioning, the headlights continue to glow.



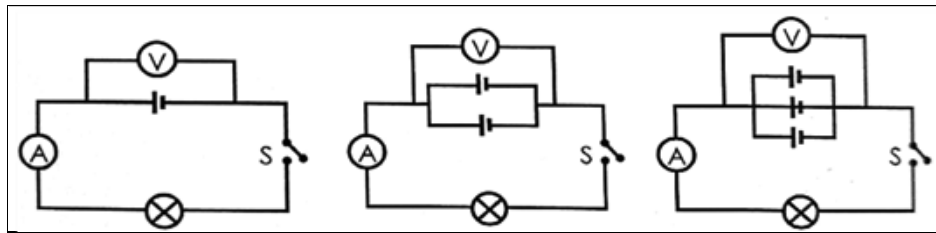
Source: <https://www.amazon.ca/toys>

What type of circuit connection has been used in the quad bike toy?

- A Series circuit
- B Parallel circuit
- C Open circuit
- D Short circuit

(1)

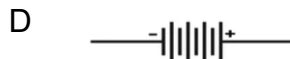
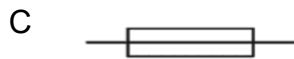
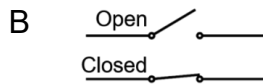
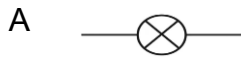
24. The illustrations show the effect of connecting more cells in parallel, on the brightness of the light bulb. The brightness of the light bulbs is observed when the switches are closed. All components are identical.



Which of the following statements is true for the above investigation?

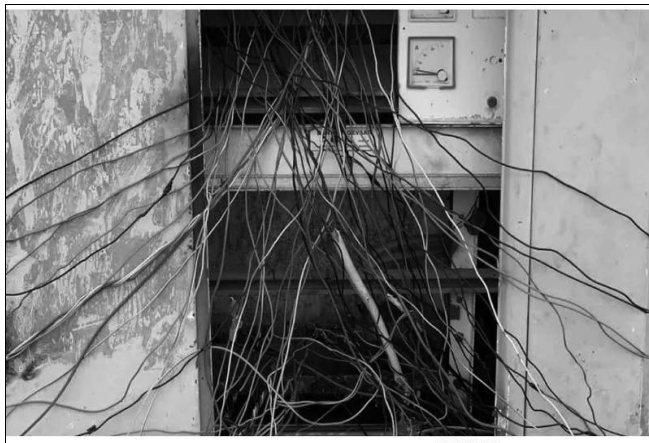
- A The brightness of the light bulb becomes dimmer as more cells are added in parallel.
 - B The brightness of the light bulb increases as more cells are connected in parallel.
 - C The light bulb burns out as more cells are connected in parallel.
 - D The brightness of the light bulb remains the same as when one cell was connected. (1)
25. What happens to the total resistance in a circuit when more resistors are added in parallel? The total resistance ...
- A increases.
 - B decreases.
 - C remains constant.
 - D decreases and then increases (1)

26. Which of the following is the safety component in an electrical circuit?



(1)

27. The picture below shows one of the examples of the illegal activities practiced in many communities across the Republic of South Africa.



Source: <http://mybroadband.co.za/news/energy/541507-illegal-electricity-chaos-south-africa.htm>

Explain how this kind of connection can negatively impact Eskom's main electricity supply. It ...

- A can lead to reduced costs for all consumers.
- B can cause increased load on the grid, leading to power outages.
- C causes high voltage energy to be distributed to consumers.
- D provides alternative electricity access in underserved areas.

(1)

28. Study the picture of a coal power plant which is emitting smoke into the atmosphere and to the nearby water bodies and vegetation.



Sourced from:

https://stock.adobe.com/search?k=&token_type=bearer&expires_in=86399&asset_id=1043975995

Which of the following describes the negative impact caused by coal energy generation?

- A Coal energy only produces smoke and ash which do not have a long-term effect on the ecosystem and global climate patterns.
 - B Coal energy releases CO₂ and other greenhouse gases which contribute to global climate change and harm the ecosystem.
 - C The smoke from the coal energy only affects the immediate area and does not contribute to global environmental issues.
 - D Coal energy generation is sustainable and environmentally friendly with minimal impact on air, water and soil quality. (1)
29. Why is it important that nuclear waste be disposed properly?
- A To prevent its overuse as a non-renewable source.
 - B To increase the efficiency of nuclear power.
 - C It remains radioactive for hundreds of years.
 - D To reduce the cost of nuclear energy production. (1)

30. In a step-down transformer that operates at 85% efficiency, what happens to 15% of the energy supplied to the primary coil?

- A It is entirely converted into additional electrical energy for the secondary coil.
- B It is lost as heat due to resistance in the coils and magnetic losses in the core.
- C It is stored in a capacitor for later use in the circuit.
- D It transforms into mechanical energy used to drive a connected load. (1)

31. Power surge is a sudden short-lived increase in electrical voltage which has a potential of damaging electronic devices.

Which ONE of the following does **not** often cause a power surge?

- A Lightning during thunderstorms.
- B Electricity production in power stations.
- C Restoration of power after load shedding.
- D Operation of high-power electrical devices. (1)

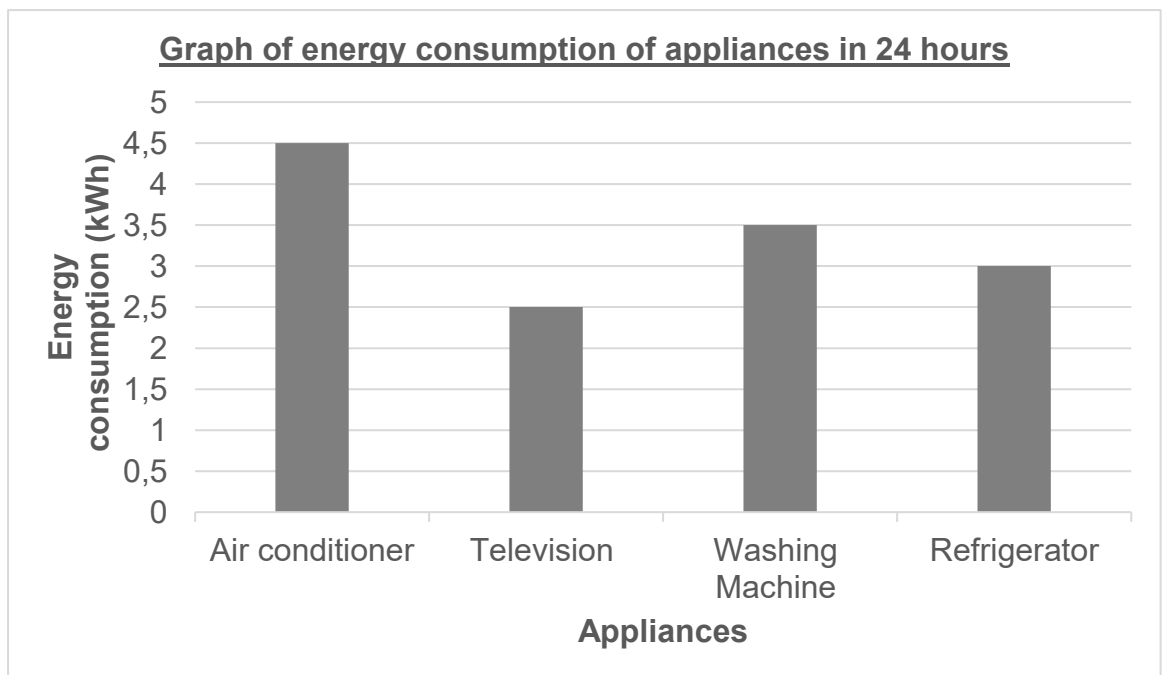
32. A Smart TV of 53 W is switched on daily for 3 hours. Calculate the cost of electrical energy that it consumes daily if the tariff is 80 cents per kWh.

Cost = power rating of appliances x number of hours x unit price of electricity.

- A R12,72
- B R14,13
- C R4,52
- D R1,41

33. What is the correct definition of electrical power?
- A The rate at which electrical energy is supplied in a circuit.
 - B The rate at which electrical energy is stored in a circuit.
 - C The amount of electrical energy stored in a circuit.
 - D The amount of electrical current that flows through a circuit.
- (1)

34. The bar graph shows the energy consumption (in kWh) of different household appliances over 24 hours.



Based on the graph, which of the following interpretation is most accurate?

- A Television has more energy consumption than the refrigerator.
 - B Air conditioner has an average energy consumption.
 - C Refrigerator consumes more energy than the washing machine.
 - D Washing machine has an average energy consumption.
- (1)

35. If you have a prepaid electricity voucher with a value of R35, how long could you run a 230 W fridge if electricity costs 72 cents per kWh?

Cost = power rating of appliances x number of hours x unit price of electricity.

- A 2,11 hours
- B 21,24 hours
- C 0,21 hours
- D 211 hours (1)

36. Which of the following statements best explains the interaction between the lithosphere and hydrosphere in the context of water erosion?

- A The gradual cooling of magma in the lithosphere that forms freshwater lakes.
- B The melting of glaciers in the hydrosphere leads to sediment deposition on riverbanks.
- C The absorption of carbon dioxide from the atmosphere into ocean waters.
- D The volcanic eruptions in the mountains cause tsunami's in the hydrosphere. (1)

37. Which of the following combinations are components of the outer core of the earth?

- A Iron oxide, dolomite and silicates
- B Magnesium silicate and iron oxide
- C Molten lava of liquid iron and nickel
- D Solid iron and nickel (1)

38. Some of the coastal areas within the country have experienced heavy rains which have caused soil erosion, leading to areas with flooding as seen in the picture.



Sourced from: <https://images.app.googl/f3bXpX5R5d3TodYx6>

Which spheres are affected in coastal areas?

- A Atmosphere, lithosphere, biosphere
 - B Biosphere, lithosphere, hydrosphere
 - C Biosphere, hydrosphere, atmosphere
 - D Hydrosphere, atmosphere, lithosphere (1)
39. Which of the following explains the lithosphere correctly?
- A A layer of the earth that consists of water and ice.
 - B It is the crust and the upper part of the mantle.
 - C The part of the Earth where living organisms exist.
 - D It is a layer which regulates weather patterns and climate. (1)

40. What distinguishes granite from other igneous rocks in terms of its formation?

Granite forms when ...

- A magma cools rapidly at shallow depths of the earth.
- B magma cools very slowly below the earth's crust.
- C lava cools rapidly on the earth's surface.
- D lava cools very slowly in the ocean.

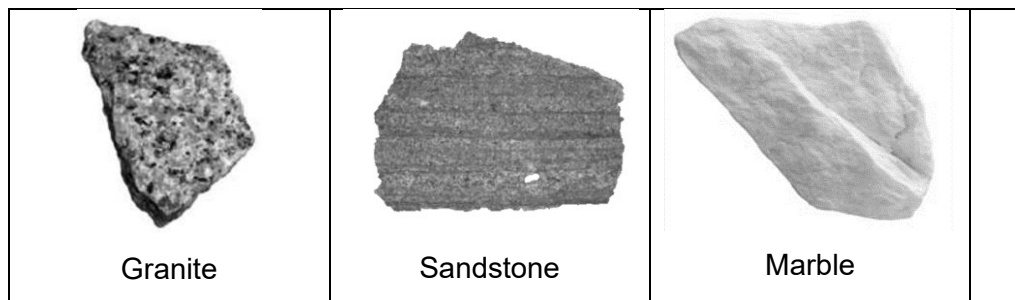
(1)

41. Why does magma rise upward towards the earth's surface during volcanic eruptions?

- A Magma is denser than the surrounding rock, making it able to rise.
- B The gases in magma increase the density and causes it to rise.
- C Magma is lighter than the surrounding solid rock due to its thermal expansion and lower density.
- D Poisonous gases and ashes in magma cause them to explode and rise.

(1)

42. Examine the following pictures of rock samples.



Source: Adapted from Siyavula workbook

Based on the visual characteristics of each sample, which of the following statements correctly identifies the types of rocks represented?

- A Picture A is sedimentary rock, Picture B is igneous rock, and Picture C is metamorphic rock.
- B Picture A is igneous rock, Picture B is metamorphic rock, and Picture C is sedimentary rock.
- C Picture A is igneous rock, Picture B is sedimentary rock, and Picture C is metamorphic rock.
- D Picture A is metamorphic rock, Picture B is igneous rock, and Picture C is sedimentary rock. (1)

43. Which sedimentary rock is formed from clay particles?

- A Sandstone
- B Shale
- C Limestone
- D Slate (1)

44. Select the combination that accurately defines weathering and erosion processes.

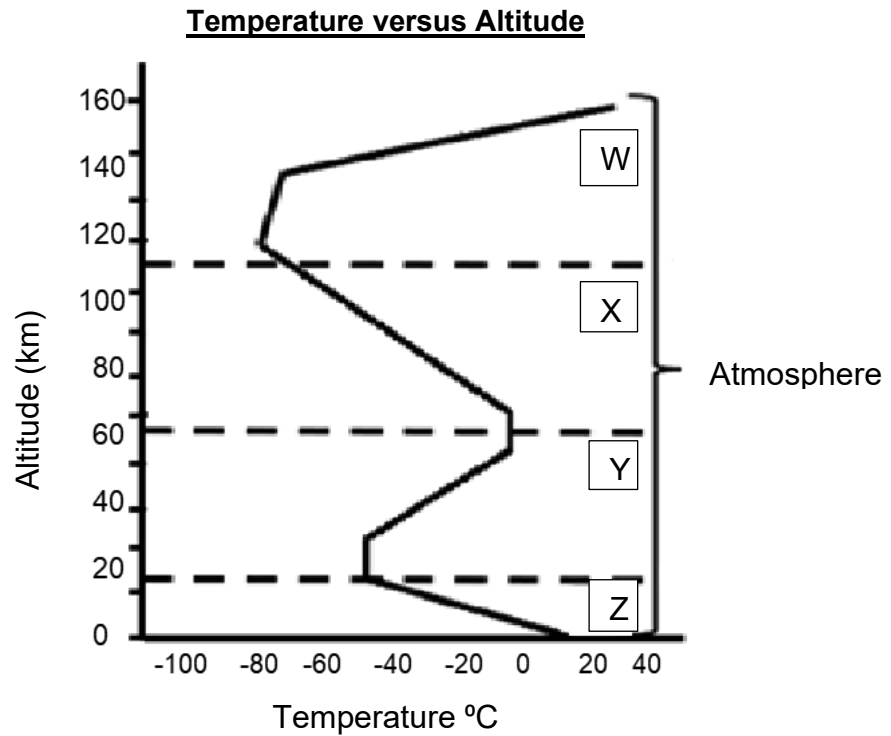
	Weathering	Erosion	
A	Movement of broken-down rocks and their minerals due to natural factors	A process of removing valuable minerals from their ore	
B	Breaking down of rocks and their minerals due to natural factors	Movement of broken-down rocks and their minerals due to natural factors	
C	A combination process of broken pieces of rocks and their minerals	Movement of broken-down rocks and their minerals due to natural factors	
D	Transportation of rock particles and minerals to rivers	Breaking down of rocks and their minerals due to natural factors	(1)

45. Which of the following explains why jets usually fly above the troposphere?

- A There is more gravitational pull in the troposphere.
- B There is less dense air in the troposphere.
- C The jet can fly slower without losing altitude.
- D To avoid turbulence caused by weather systems and clouds. (1)

Study the diagram below and answer questions 46 – 47.

46.



Identify the layer where weather processes occur.

- A W
- B X
- C Y
- D Z

(1)

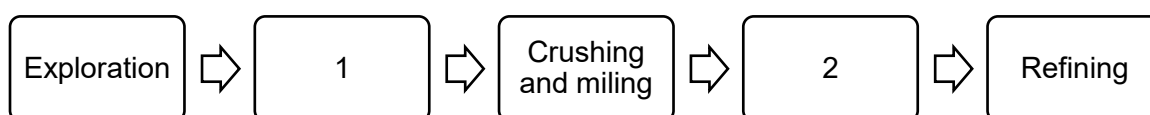
47. Which atmospheric layer reflects radio waves back to Earth?

- A W
- B X
- C Y
- D Z

(1)

48. Why are there fewer or no clouds in the stratosphere?
- A The air in this layer is in constant motion and its density is high.
 - B The air in this layer is stable and the density is very low.
 - C The air density is extremely low and temperature decreases as altitude increases.
 - D The air in this layer is unstable and its density is high. (1)
49. Identify the sequence that correctly arranges the Earth's atmospheric layers from the Earth's surface upwards?
- A Troposphere → Stratosphere → Mesosphere → Thermosphere
 - B Stratosphere → Troposphere → Mesosphere → Thermosphere
 - C Mesosphere → Troposphere → Stratosphere → Thermosphere
 - D Thermosphere → Mesosphere → Stratosphere → Troposphere (1)
50. Most minerals are found as compounds in rocks, but some of them can be used in their natural form.
- Which mineral can be used in its natural form?
- A Iron
 - B Gold
 - C Diamond
 - D Copper (1)

51. Study the mining process illustrated in the flow diagram:



Which mining processes are represented by 1 and 2 in the diagram above?

- A 1 – floatation; 2 – leaching
 - B 1 – extraction; 2 – separation
 - C 1 – separation; 2 – extraction
 - D 1 – leaching; 2 – extraction (1)
52. Select a statement that correctly describes the extraction process of lead from lead oxide. Lead oxide ...
- A is directly heated in air to obtain pure lead metal.
 - B is first heated in air to form lead carbon.
 - C is heated together with fine carbon to form lead and carbon dioxide.
 - D reacts with acid to dissolve lead, followed by precipitation of pure lead. (1)

53. The picture shows one of the physical methods of separating minerals from waste.



Source adapted from: Siyavula

Which physical separating process is used in the above picture?

- A sieving
- B panning
- C magnetic separation
- D crushing and grinding

(1)

54. The picture shows some of the activities that are done by mining companies. Study the picture and answer the question that follows.

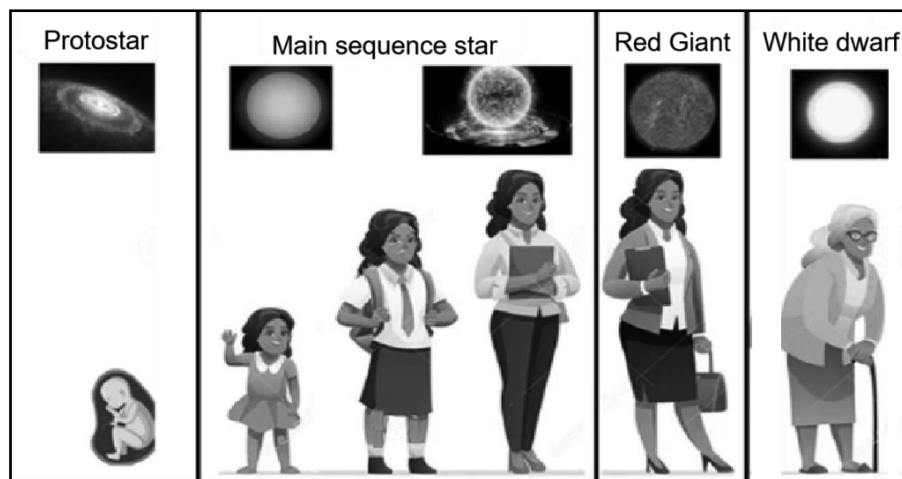


Choose ONE significant environmental consequence of deforestation in large-scale mining operations.

- A Loss of biodiversity and destruction of wildlife habitats.
- B Increased soil fertility and agricultural productivity.
- C Enhancement of water quality in nearby streams.
- D Reduction in global temperatures due to open spaces.

(1)

55. Differentiate between stellar nebulae and planetary nebulae.
- A Stellar nebulae are beautiful remains of dead stars while planetary nebulae are birth places of stars.
 - B Stellar nebulae are birth places of stars while planetary nebulae are beautiful remains of stars.
 - C Planetary nebulae are regions where new stars form while stellar nebulae are the outer layers of dying stars.
 - D Stellar nebulae are composed mainly of helium while planetary nebulae are composed mainly of hydrogen. (1)
56. The picture shows different stages of evolution of a star compared to the life cycle of a person.



What changes occur when a star enters a white dwarf phase from a red giant?
The star ...

- A increases in size and temperature and loses its outer layer.
- B decreases in size, increases in temperature, and loses its outer layers.
- C remains the same size, loses its outer layers and decreases in temperature.
- D increases in size, loses its outer layer and decreases in temperature. (1)

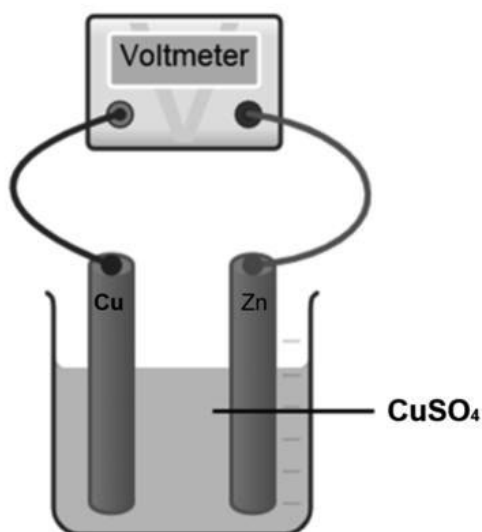
[56]

SECTION B

1. The table shows the mass and weight of two stones on the Moon and on Earth.

Stones	Mass of stones in (kg)	Weight of stones in (N)
Stone A	10	98
Stone B	60,5	98

- 1.1 Where was stone B measured? (1)
- 1.2 Why is the weight of stone A and stone B the same? (1)
2. The diagram shows an electric cell consisting of an electrolyte, copper (Cu) and zinc (Zn) electrodes.



State the hypothesis of what will happen in the electric cell.

(2)

3. The table shows the results obtained during an investigation to determine the effect of connecting more cells in series.

Number of cells	Ammeter reading (A)	Voltmeter reading (V)	Brightness of light bulbs
1	0,5 A	1,5 V	Dim
2	1,0 A	3,0 V	Bright
3	1,5A	4,5V	Very bright

- What conclusion can you draw regarding the results as shown in the table? (2)
4. Name the nuclear power station that is found in the Republic of South Africa. (1)
5. Mention an alternative system for heating water that can reduce reliance on the national electricity grid. (1)
6. Which sphere contains all living organisms? (1)
7. Which type rock is formed from solidifying sediment? (1)
8. How was iron ore extracted in the olden days? (2)
9. Discuss ONE negative impact of an increase in percentage of carbon dioxide in the atmosphere on weather patterns. (2)

[14]

End of test