

# PROVINCIAL EXAMINATION

## NOVEMBER 2022

### GRADE 9

#### NATURAL SCIENCES

**TIME:** 2 hours

**MARKS:** 100

18 pages

**NAME OF LEARNER:** \_\_\_\_\_

**GRADE: 9** \_\_\_\_\_

QUESTION	1	2	3	4	5	6	7	8	9	10	TOTAL
LEARNER'S MARK											
MARKS	9	6	5	15	14	14	10	16	8	3	100

**INSTRUCTIONS AND INFORMATION**

1. Write your name, surname and class on this question paper that serves as an answer sheet.
2. Answer ALL the questions on the question paper.
3. This question paper consists of SECTIONS A and B and is based on the prescribed content framework in the CAPS document.
4. Allocation of marks:  
  
SECTION A: 20  
SECTION B: 80
5. This question paper consists of TEN questions.
6. All drawings must be done in pencil and labelled in blue ink.
7. Write neatly and legibly.

## SECTION A

## QUESTION 1: MULTIPLE-CHOICE QUESTIONS

Various options are provided as possible answers to the following questions.  
Choose the correct option by writing the correct letter (A – D) in the block provided.

1.1 A field force ...

- A is always a force of attraction.
- B occurs only between magnetic and electrical charges.
- C results in an action over a distance between two bodies.
- D is the only type of force that is able to change the speed of an object.

(1)

1.2 The electrostatic force between two charged objects is  $F$ . The distance between them is increased. How does the electrostatic force change?

- A It increases.
- B It decreases.
- C It remains the same.
- D None of the above.

(1)

1.3 A/An ... rock is derived from a volcanic rock.

- A mineral
- B igneous
- C metamorphic
- D sedimentary

(1)

1.4 The gas found in the atmosphere that causes global warming is ...

- A carbon dioxide.
- B ozone.
- C nitrogen.
- D hydrogen.

(1)

1.5 The colour of the stars can tell their surface temperature. Which of the following arrangements represents the colours of the stars from the hottest to the coolest?

- A Blue → White → Red
- B Red → White → Blue
- C Red → Blue → White
- D White → Red → White

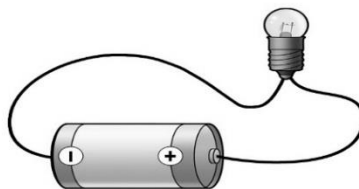
(1)

- 1.6 Anna likes baking. She decided to squeeze an orange to get the juice into her mixture, to add flavour. State the effect of the force that she applied on the orange.



- A Changes movement
- B Changes direction
- C Changes shape
- D Changes speed

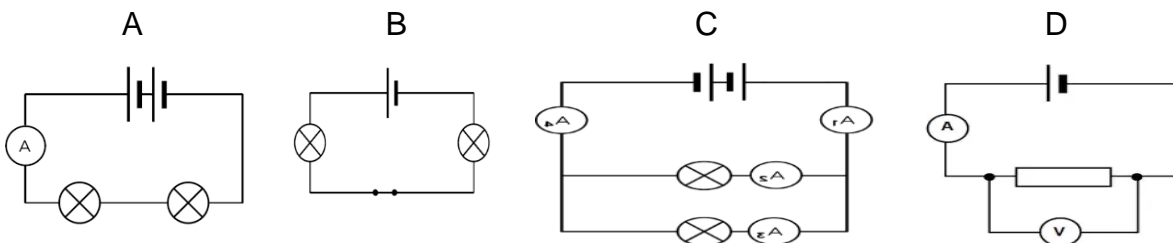
- 1.7 The brightness of the bulb in the electrical circuit below will increase if ...



- A the wire is made longer.
- B the wire is made thicker.
- C the wire becomes hotter.
- D another bulb is added in series.

(1)

- 1.8 Which of the following circuit diagrams represents a parallel circuit?



(1)

- 1.9 Generating electricity by using coal is called ...

- A nuclear power.
- B thermal electricity.
- C transformation.
- D hydroelectricity.

(1)

[9]

**QUESTION 2: TERMINOLOGY**

Give the correct scientific term for each of the following descriptions. Write only the term in the spaces provided.

- 2.1 A conductor that opposes the flow of electric charge  
\_\_\_\_\_ (1)
- 2.2 The force by which a planet or other body draws objects towards its centre  
\_\_\_\_\_ (1)
- 2.3 A device that opens and closes a circuit  
\_\_\_\_\_ (1)
- 2.4 A molten rock under the crust  
\_\_\_\_\_ (1)
- 2.5 A massive discharge or release of electrons between a thunder cloud and the ground  
\_\_\_\_\_ (1)
- 2.6 Rock from which a metal can be extracted  
\_\_\_\_\_ (1)
- [6]**

**QUESTION 3: MATCHING ITEMS**

Choose an term from COLUMN B that matches a statement in COLUMN A. Write only the letter (A – F) next to the question numbers (3.1 to 3.5) in the spaces provided in COLUMN C.

COLUMN A	COLUMN B	COLUMN C
3.1 The dredging form of mining that extracts minerals from loose sand	A Pumice	3.1 _____ (1)
3.2 The boundary between the mesosphere and the thermosphere	B Biosphere	3.2 _____ (1)
3.3 The layer of gases held around the earth by gravity	C Planetary nebulae	3.3 _____ (1)
3.4 The outer gases of a white dwarf that are ejected into space and form an expanding cloud	D Mesopause	3.4 _____ (1)
3.5 Type of igneous rock	E Open cast mining	3.5 _____ (1)
	F Atmosphere	

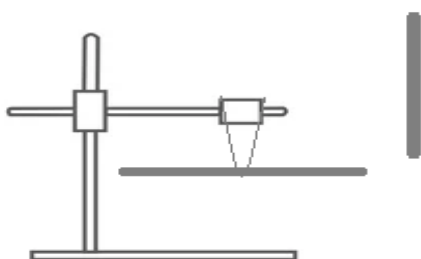
**[5]****TOTAL SECTION A: 20**

## SECTION B

## QUESTION 4: FORCES

4.1 Learners are provided with 2 glass rods; a retort stand and a woollen cloth.

They are required to perform an experiment using the apparatus provided. The diagram below guides learners on the steps to follow.



**Step 1:** Rub a glass rod with woollen cloth and hang it on a retort stand.

**Step 2:** Rub another glass rod and bring it closer to the hanging rod on the retort stand and observe what happens.

4.1.1 What is the aim of this experiment?

\_\_\_\_\_ (2)

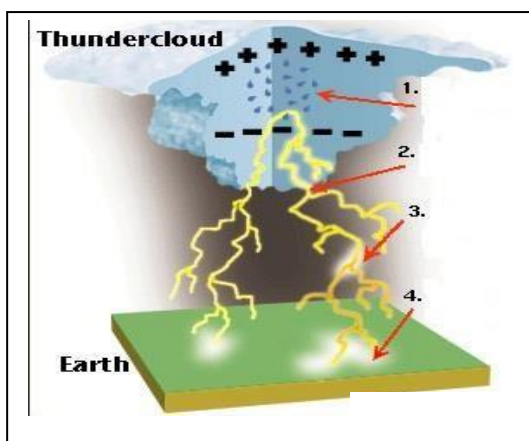
4.1.2 Explain what happens when the rod is being rubbed with a woollen cloth?

\_\_\_\_\_ (2)

4.1.3 What will happen when you bring a rubbed rod next to another rubbed one which is hanging on the retort stand as shown in the diagram?

\_\_\_\_\_  
\_\_\_\_\_ (2)

4.2 Study the following diagram and answer the questions that follow.



4.2.1 The formation of lightning can be summarised using the four steps represented by numbers 1 – 4 in the diagram above. Rearrange the statements from A – D below to match steps 1 – 4 in the diagram. Do not rewrite the statement. **Use only the letters (A – D).**

- A The potential difference becomes too great, negative and positive charges join, electrical discharge creates a flash and hits the ground.
- B Ions and free electrons are produced in the air outside the cloud and positive electricity rises from the ground.
- C Water droplets (particles) in the cloud ionise, ice and water particles separate due to movement and friction.
- D Negative charges accumulate at the base of the cloud and fall to the earth.

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(4)

4.2.2 Mention TWO ways that you can apply to protect yourself against lightning.

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(2)

4.3 A spacecraft travelled from the Earth to the Moon. Calculate the weight of the spacecraft when on Earth if its mass is 1 485 kg.

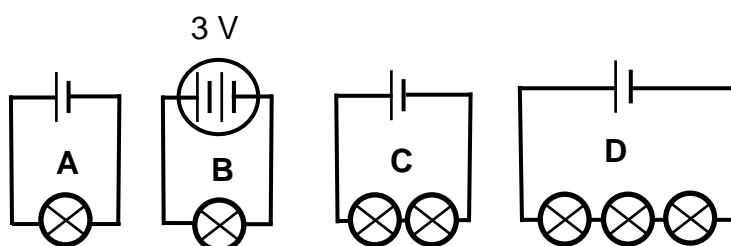
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(3)  
[15]



**QUESTION 5: CELLS AND ENERGY, RESISTANCE**

- 5.1 Study circuits A, B, C and D and answer questions 5.1.1 to 5.1.5 below. All bulbs and cells are identical.



- 5.1.1 Which circuit has the highest resistance?

\_\_\_\_\_ (1)

- 5.1.2 In circuit **B**, what is the component that is circled?

\_\_\_\_\_ (1)

- 5.1.3 What is the purpose of the circled component?

\_\_\_\_\_ (1)

- 5.1.4 What is the voltage of each cell in circuit **B**?

\_\_\_\_\_  
\_\_\_\_\_ (2)

- 5.1.5 In which circuit will the bulb/bulbs be the brightest?

\_\_\_\_\_ (1)

- 5.2 Mention TWO factors that can influence the resistance of a resistor.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ (2)

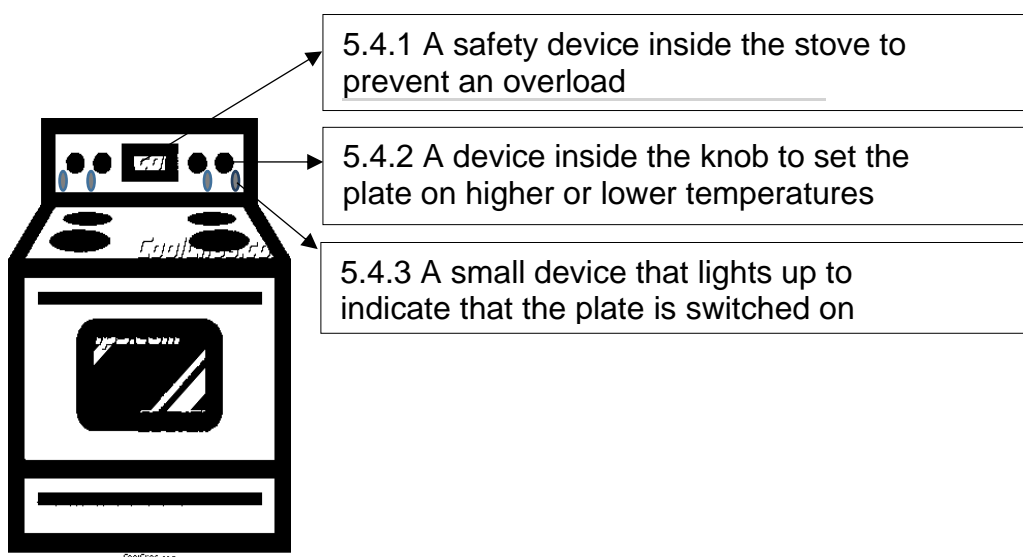
- 5.3 Describe how each factor you chose in QUESTION 5.2 affects the resistance of the resistor.

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(2)

- 5.4 Study the labels of an electric stove in the diagram below. Give the correct scientific term or word for each of the descriptions. Write only the answers in the spaces provided.



5.4.1 \_\_\_\_\_

5.4.2 \_\_\_\_\_

5.4.3 \_\_\_\_\_ (3)

- 5.5 State an example of a safety device that can be used in our houses.

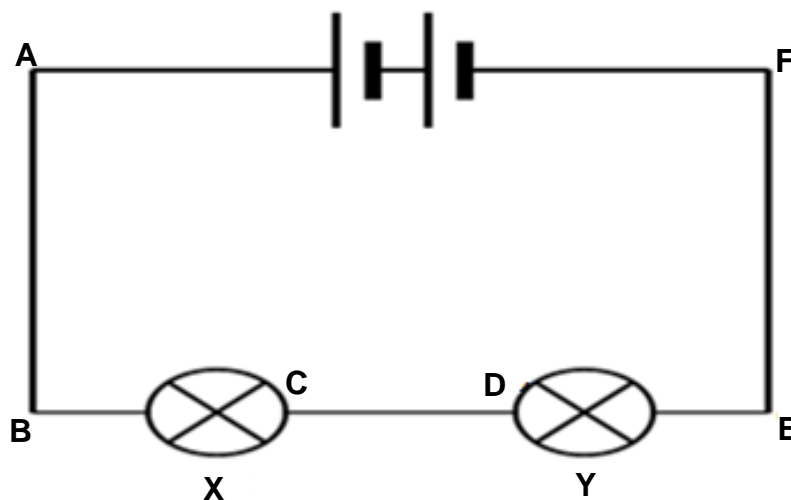
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(1)

[14]

**QUESTION 6: ELECTRICAL CIRCUITS**

- 6.1 Two identical cells, two different light bulbs and connecting wires are connected as shown in the diagram below. Bulb **X** has a higher resistance than bulb **Y**. The potential difference across the two cells is 3V.



- 6.1.1 Name the device used to measure potential difference.

\_\_\_\_\_ (1)

- 6.1.2 If the current that flows in **AB** is 1A, will the current that flows in part **EF** of the circuit be MORE THAN, LESS THAN OR EQUAL TO 1A?

\_\_\_\_\_ (1)

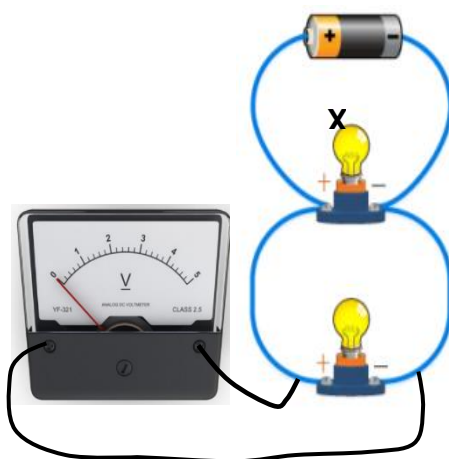
- 6.1.3 If the potential difference across bulb **X** is 2V, calculate the potential difference across bulb **Y**. Show your workings.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ (3)

- 6.1.4 If light bulb **X** blows, what will happen to light bulb **Y**? Explain your answer.

\_\_\_\_\_  
\_\_\_\_\_ (2)

6.2 Consider the following picture of an electric circuit.



6.2.1 Use the information in the picture above and draw the corresponding circuit diagram.



(4)

6.2.2 What will happen to the voltmeter reading if the bulb marked **X** fuses? Write down only INCREASES, DECREASES or REMAINS THE SAME.

(1)

6.2.3 Provide a reason why a voltmeter is always connected in parallel in a circuit.

(2)

[14]

**QUESTION 7: COST OF POWER CONSUMPTION**

- 7.1 The electricity voucher below was bought at a supermarket. The voucher shows the number of electricity units bought and how much money was spent to buy these units of electricity.

Electricity Credit	
-----	
6777 0749 9086	
2063 4573	
-----	
Amount:	R26.09
Tax:	R3.91
-----	
Total:	R30.00
-----	
Receipt Ref: 59190819185830789	
-----	
Free Units	: 0.00 kWh
Credit Units	: 11.90 kWh
-----	
Total Units	: 11.90 kWh

- 7.1.1 How many units were bought with R30,00?

(1)

- 7.1.2 Use the information on the voucher and determine the cost of electricity per unit.

(2)

- 7.1.3 Use your answer in QUESTION 7.1.2 to determine how much it will cost to keep a 60w bulb on for 24 hours.

**Remember:** Cost = Power X Time X Unit price

(3)

7.1.4 Name ONE way in which consumers can reduce their electricity bills.

\_\_\_\_\_ (1)

7.2 Consider electricity generated in a coal power station versus electricity generated in a nuclear power station.

7.2.1 Name ONE similarity between the two power stations.

\_\_\_\_\_ (1)

7.2.2 Name ONE difference between the two power stations.

\_\_\_\_\_ (2)

[10]

### QUESTION 8: INTERACTION OF THE EARTH'S SPHERES

The diagram below illustrates the interaction of the spheres of the Earth as a complex system.



8.1 Describe the interaction between the different spheres given in questions 8.1.1 to 8.1.3 below.

8.1.1 Volcanoes erupt, shooting gases and dust into the atmosphere.

\_\_\_\_\_ (1)

8.1.2 Water evaporates from oceans, becoming vapour in the atmosphere.

\_\_\_\_\_ (1)

8.1.3 Plants derive water from soil. Animals use water to sustain life.

\_\_\_\_\_ (1)

8.2 Complete the table below by filling in the labels A to E.

Type of Rock	<b>A</b>	<b>B</b>	Metamorphic
Formation	Magma that has cooled	<b>C</b>	<b>D</b>
Presence of crystals	Crystals	none	Crystals
Example	Granite	<b>E</b>	Marble

A \_\_\_\_\_

B \_\_\_\_\_

C \_\_\_\_\_

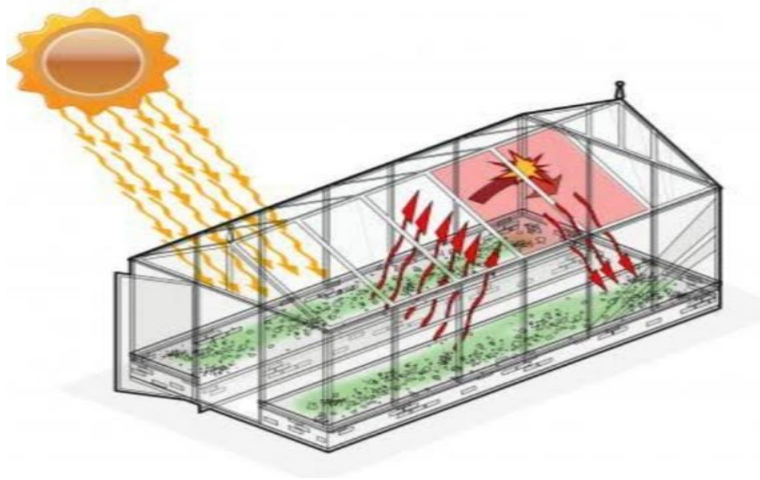
D \_\_\_\_\_

E \_\_\_\_\_ (5)

8.3 Rocks on the surface of the Earth are weathered to form smaller particles. Mention any THREE important factors that influence the process of weathering.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ (3)

8.4 Study the diagram below and answer the questions that follow.



8.4.1 What is the name of the structure represented in the diagram?

(1)

8.4.2 Which form of energy is trapped inside the structure?

(1)

8.4.3 Which layer of the atmosphere resembles the glass panes in the structure above?

(1)

8.4.4 Which natural process produces the gas found in the atmosphere that absorbs or re-emits the energy radiated by the sun?

(1)

8.4.5 What is the advantage of this natural process for life on the Earth?

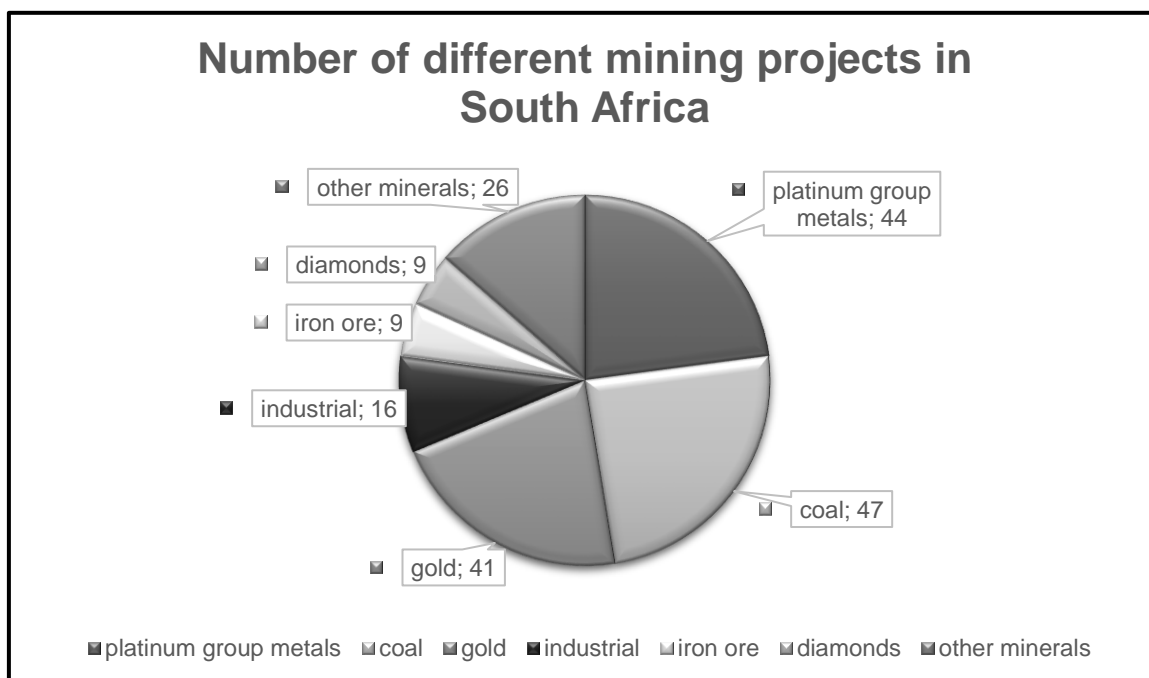
(1)

[16]



**QUESTION 9: IMPACT OF MINING ON THE ENVIRONMENT**

- 9.1 The pie chart below shows the number of different mining projects in South Africa that were ready to start production in 2017.



Use the information provided in the pie chart to answer the following questions.

- 9.1.1 Which mining project is the largest among the possible new mines that were ready for new production in 2017?

\_\_\_\_\_ (1)

- 9.1.2 Calculate the percentage (%) of the number of possible new gold mines.

\_\_\_\_\_  
\_\_\_\_\_ (2)

- 9.1.3 Where does mining take place in an open cast mine?

\_\_\_\_\_ (1)

- 9.1.4 Is iron ore a mixture or a compound? Provide a reason for your answer.

\_\_\_\_\_  
\_\_\_\_\_ (2)

9.1.5 Name and discuss ONE way in which mining can impact the environment.

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(2)  
[8]

#### QUESTION 10: BIRTH, LIFE AND DEATH OF STARS

10.1 Explain what happens in the nuclear reactions.

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(2)

10.2 Why is it not possible for light to escape a black hole?

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(1)  
[3]

**TOTAL SECTION B: 80**

**TOTAL: 100**

**END**