



education

Department:
Education
PROVINCE OF KWAZULU-NATAL

FORMAL TEST
SEPTEMBER
2023
GRADE 9

NATURAL SCIENCES

TIME: 1 hour

MARKS: 60

16 pages

NAME OF LEARNER: _____

GRADE: 9 _____

QUESTION	1	2	3	4	TOTAL
LEARNER'S MARK					
MARKS	15	17	5	18	60

P.T.O.

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: 15
SECTION B: 45
5. This question paper consists of FOUR questions.
6. All drawings must be done in pencil and labelled in blue ink.
7. Write neatly and legibly.

SECTION A**QUESTION 1:****1.1 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.

1.1.1 When components in a circuit are connected in series, that means.....

- A same current throughout the components
- B the current separates
- C other components get greater current other get less.
- D current strength degrees

(1)

1.1.2 shadows are formed because?

- A all object reflects light.
- B Light travels at a greater speed
- C Light travels in a straight line
- D Because of opaque objects

(1)

1.1.3 An Example of a luminous object.

- A Sun
- B Chalk
- C Ruler
- D White walls

(1)

1.1.4 a filament in a light bulb is made up of.....?

- A copper
- B nichrome
- C Silver
- D Magnesium

(1)

1.1.5 A component in a circuit that resist the flow of electrons in a circuit....

- A Resistor
- B Voltmeter
- C Ammeter
- D Cell

(1)

1.2: TERMINOLOGY

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

1.2.1 A component that overheats, melts and break an electric circuit.

_____ (1)

1.2.2 A component in an electric circuit that produces electrical energy

_____ (1)

1.2.3 A device that opens and closes a circuit.

_____ (1)

1.2.4 A sub-atomic particle that gets transferred from one object to the other.

_____ (1)

1.2.5 A massive discharge or release of electrons between a thunder cloud and the ground

_____ (1)

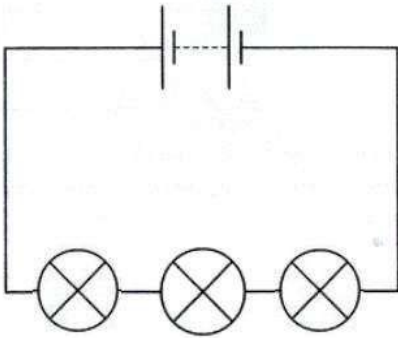
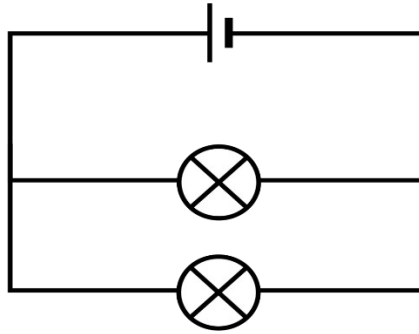
1.3: MATCHING ITEMS

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
1.3.1 The build-up of electric charge.	A Friction	3.1 _____ (1)
1.3.2 process which causes electrons to be transferred from one object to another.	B Static electricity	3.2 _____ (1)
1.3.3 the pulling away of two like charged objects.	C Conduction wire	3.3 _____ (1)
1.3.4 a device used to measure the voltage.	D Insulator	3.4 _____ (1)
1.3.5 metal containing copper which becomes a magnet when electric current passes through it.	E Repulsion	3.5 _____ (1)
	F Voltmeter	

[5]

TOTAL SECTION A: 15**SECTION B**

QUESTION 2:**A****B**

2.1 which of the above circuits (A or B) is connected in parallel?

(1)

2.2 which bulbs circuit (A or B) has greater brightness? give a reason for your answer.

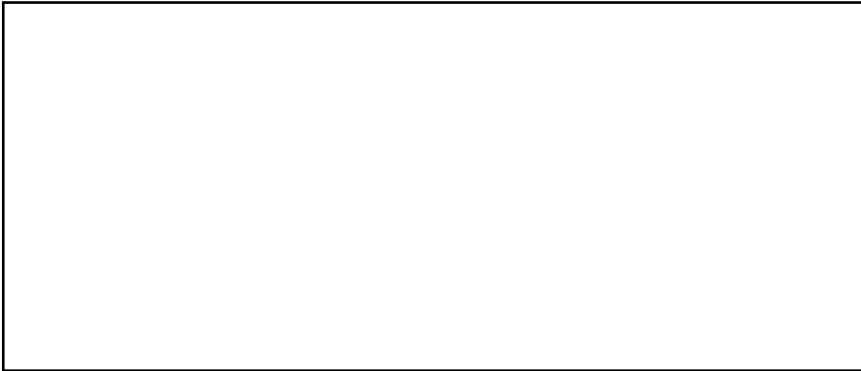
(3)

2.3 what will happen in circuit B when one of the bulbs burns out?

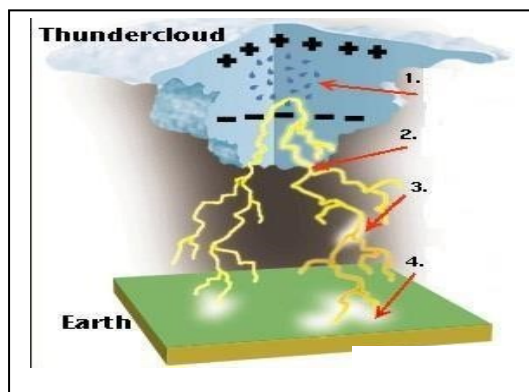
(2)

2.4 Draw a circuit with the following components. 3 cells connected in series, 2 bulbs in parallel and one in series and a closed switch.

(5)



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



2.5.1 The formation of lightning can be organized 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 ionize, 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.

(4)

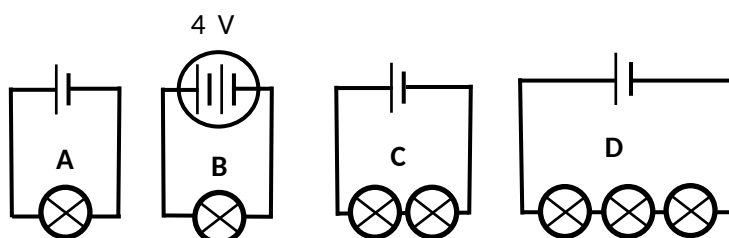
2.5.2 Mention TWO ways that you can apply to protect yourself against lightning.

(2)

[17]

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?

(2)

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 FOUR factors that can influence the resistance of a resistor.

(4)

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

(2)

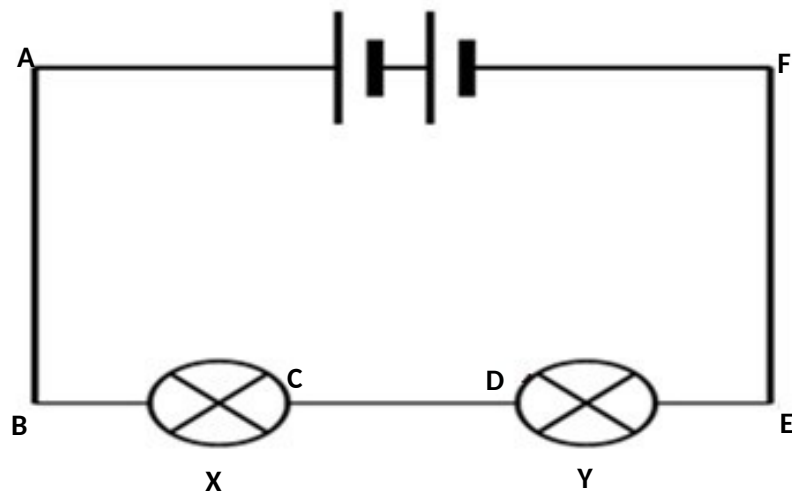
5.4 if each bulb has a resistance of 5 ohms calculate the total resistance in **CIRCUIT D**.

(3)

[16]

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)

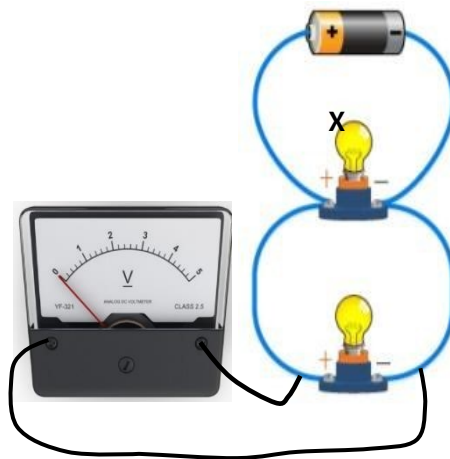
6.1.3 If the potential difference across bulb **X** is 2V, calculate the potential difference across bulb **Y**. Show your workings.

_____ (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 is 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.

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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	: 25 kWh

Total Units	: 25 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 2 100w bulbs on for 24 hours.

Remember: $\text{Cost} = \text{Power} \times \text{Time} \times \text{Unit price}$

(5)

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)

[12]

*****GOOD LUCK*****