Province of the
EASTERN CAPE
EDUCATION

SENIOR PHASE

GRADE 9

NOVEMBER 2016

NATURAL SCIENCES MEMORANDUM

MARKS: **100**

This memorandum consists of 9 pages.

INSTRUCTIONS AND INFORMATION

1. Mark allocation in this paper is based on the level of answers required from learners.

2. Some expected answers have various or multiple answers. ONLY the required number of answers or facts will be considered.

3. Where applicable, an answer that has more than one mark or point, marks can be deducted where there are missing facts.

SECTION A

QUESTION 1: MULTIPLE-CHOICE QUESTIONS

NO.	EXPECTED ANSWER	LETTER	MARK	
1.1	Potential difference	**A**	√	(1)
1.2	volt	**B**	√	(1)
1.3	non-contact forces	**C**	√	(1)
1.4	Unlike charges attract each other	**B**	√	(1)
1.5	is dangerous and regarded as energy theft	**A**	√	(1)
1.6	The mantle, crust and the soil	**A**	√	(1)
1.7	sedimentary, igneous and metamorphic	**C**	√	(1)
1.8	very dense and has high gravity.	**A**	√	(1)
1.9	black hole	**B**	√	(1)
1.10	Nuclear fusion	**D**	√	(1)

[10]

QUESTION 2: CORRECT WORDS/TERMS

NO.	EXPECTED ANSWER	MARK	
2.1	Electrons	√	(1)
2.2	An ore	√	(1)
2.3	The mantle	√	(1)
2.4	A mineral	√	(1)
2.5	Hydro-electricity	√	(1)

(5 x 1) **[5]**

QUESTION 3: MATCHING ITEMS

NO.	EXPECTED ANSWER	LETTER	MARK	
3.1	A resistor	**D**	√	(1)
3.2	An insulator	**F**	√	(1)
3.3	Atmosphere	**A**	√	(1)
3.4	Third position away from the sun	**G**	√	(1)
3.5	Global warming	**B**	√	(1)

(5 x 1) **[5]**

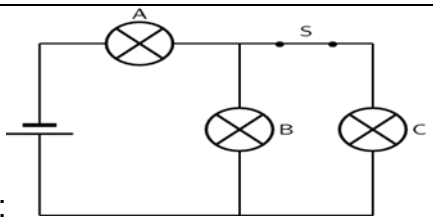
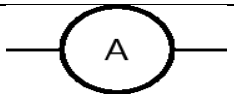
TOTAL SECTION A: 20

SECTION B: ENERGY AND CHANGE

QUESTION 4: FORCES

NO.	EXPECTED ANSWERS	MARK	
4.1	Newton/s	√	(1)
4.2	North and South Pole	√√	(2)
4.3	Force is a push or a pull.	√	(1)
4.4	Sir Isaac Newton	√	(1)
4.5	Contact and non-contact forces	√√	(2)
4.6	Gravitational force	√	(1)
4.7	Frictional forces	√√	(2)
			[10]

QUESTION 5: ELECTRICITY AND ELECTRIC CIRCUITS

NO.		EXPECTED ANSWERS	MARK	
5.1		An electric circuit: 	√√√√√	(5)
5.2	5.2.1	Open switch: 	√	(1)
	5.2.2	Voltmeter: 	√	(1)
	5.2.3	Resistor: 	√	(1)
	5.2.4	Conductor/Connector: _____	√	(1)
	5.2.5	Ammeter: 	√	(1)
5.3		• The material of which the conductor is made. Different materials offer different degrees of resistance to the passing of the current.	√√	(2)
		• The length of the conductor. The longer the conductor, the greater is the resistance.	√√	(2)
		• The thickness of the conductor. The thicker the conductor, the smaller the resistance.	√√	(2)
		• The temperature of the conductor. The higher the temperature, the greater is the resistance.	√√	(2)
				[18]

QUESTION 6: PRACTICAL INVESTIGATION

NO.	EXPECTED ANSWERS	MARK	
6.1	Kitchen appliances consume most electricity, because it has the highest percentage (29%) in comparison to all other appliances. (½ mark for giving the correct answer and the explanation.)	√	(1)
6.2	There are many of these appliances if the student is correct, give him/her a mark. Electrical stove, kettle, Iron, microwave etc. (½ mark for each example.)	√	(1)
6.3	• Switching off unnecessary lights. • Can use gas stoves and kettles. • Wash light clothes by hands. (All related answers are correct.)	√√	(2)
6.4	29% of kitchen appliances and 17% of air-conditioning. **Answer: 46%**	√	(1)
6.5	Calculation is only one mark, since these are grade nines. Basic calculation. 7% of R200 7 ÷ 100 = 0,07 0,07 x 200 = R14 This family spends R14 of their electricity bill on laundry appliances.	√√	(2)
			[7]

QUESTION 7: SERIES AND PARALLEL CIRCUITS CALCULATIONS

NO.	EXPECTED ANSWERS		MARK	
7.1	Calculation: Three resistors in series			
	7.1.1	Total resistance = $R_1 + R_2 + R_3$ = 20 Ω + 20 Ω + 20 Ω = 60 Ω	√√√	(3)
	7.1.2	Current = $\frac{V}{R}$ = $\frac{120 \text{ volt}}{60 \Omega}$ = 2 A	√√√	(3)
7.2	Current = Voltage ÷ Resistance (I = V ÷ R)		√√√	(3)
7.3	The voltage shown by each bulb will be 3 V. (Voltage is the same, not shared.)		√√	(2)
7.4	Series circuit	Parallel circuit		
	• Voltage is shared. • Resistance is the same throughout.	• Voltage is not shared. • Resistance is different throughout.	√√√√	(4)
				[15]

TOTAL SECTION B: 50

SECTION C: PLANET EARTH AND BEYOND

QUESTION 8: EARTH AS A SYSTEM

NO.	EXPECTED ANSWERS	MARK	
8.1	• The **biosphere** consists of all living organisms (animals and plants) which survive because of their interaction with the **lithosphere** (solid rock and soil), and these need water and gas (**hydrosphere** and the **atmosphere**) in order to survive. Therefore, one can only survive with the support of the other. (If the learner explains the interaction correctly full marks must be awarded.)	√√√√	(4)
8.2	• Nitrogen – 78% • Oxygen – 21% • Carbon dioxide – less than 1%	√ √ √	(3)
8.3	• Igneous rocks • Sedimentary rocks • Metamorphic rocks	√ √ √	(3)

[10]

QUESTION 9: MINING OF MINERAL RESOURCES

NO.	EXPECTED ANSWERS		MARK	
9.1	• Mining leads to loss of farming and wild life environments. • Processing the gold ore leaves solid waste behind. • Mining activities often encroach on protected areas. • Mining threatens biodiversity in the operational areas. • Mining can result in acid formation and global warming. • Mining leads to the creation of mine dumps that damage places with high tourist or cultural heritage value. (Any four related answers)		√√√√	(4)
9.2	Sand, potash and diamonds. (Any 1 x 1)		√	(1)
9.3	9.3.1	Al – Aluminium	√	
	9.3.2	Au – Gold	√	
	9.3.3	Cu – Copper	√	(3)
9.4	To make:			
	• Jewellery • Tools • Weapons • Machinery and decorations (Any two of these and other related answers.)		√√	(2)

[10]

QUESTION 10: BIRTH, LIFE AND DEATH OF STARS

NO.	EXPECTED ANSWERS	MARK	
10.1	Stars	√	(1)
10.2	10.2.1 Blue	√	(1)
	10.2.2 Red	√	(1)
10.3	Nebulae	√	(1)
10.4	Nuclear	√√	(2)
10.5	Planetary nebulae	√√	(2)
10.6	White dwarf	√√	(2)
			[10]

TOTAL SECTION C: 30
GRAND TOTAL: 100