



**PROVINCIAL EXAMINATION**  
**NOVEMBER 2021**  
**GRADE 9**  
**MARKING GUIDELINES**

**NATURAL SCIENCES**

**8 pages**

**SECTION A****QUESTION 1**

- 1.1 **A ✓** Gravity and reaction forces
- 1.2 **C ✓** Magma, Igneous, Sedimentary, Metamorphic
- 1.3 **B ✓** Helium
- 1.4 **B ✓** Repulsion
- 1.5 **A ✓** white dwarf
- 1.6 **C ✓** results in an action over a distance between two bodies.
- 1.7 **B ✓**
- 1.8 **A ✓** Long, thin and hot
- 1.9 **B ✓** hydroelectricity

**[9]****QUESTION 2**

- 2.1 Battery ✓ (1)
- 2.2 Mass ✓ (1)
- 2.3 Fuse ✓ (1)
- 2.4 Atmosphere ✓ (1)
- 2.5 National electricity grid ✓ (1)
- 2.6 Sediment ✓ (1)

**[6]**

**QUESTION 3**

- 3.1 F/Ore ✓
- 3.2 D/Hydrosphere ✓
- 3.3 A/Stratosphere ✓
- 3.4 B/Biosphere ✓
- 3.5 C/Planetary Nebulae ✓

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

## SECTION B

## QUESTION 4

## FORCES

4.1 4.1.1 Pushing/Compression ✓✓ (2)

4.1.2 She makes it move./change direction ✓ and brings it to a standstill. ✓ (2)

4.2 Weight = Mass in kg x 9,8 N  
55 kg x 9,8 N ✓  
539 ✓ N ✓ (3)

4.3 Mass is the amount of matter that a substance/object consists of ✓ whereas weight is the force of gravity with which the earth attracts objects towards itself. ✓

OR

Mass is the quantity measured in kilograms ✓ and weight is the quantity measured in Newtons. ✓ (2)

4.4 Gravitational force; ✓ electrostatic; ✓ magnetic ✓  
(Any 2) (2)

4.5 A thundercloud becomes charged ✓ by the rubbing together of air and water particles moving past each other in the atmosphere. ✓  
A lightning strike occurs when there is a massive discharge (the release of charge) between the thundercloud and the ground. ✓ Lightning is the giant spark of electricity. ✓ (4)

[15]

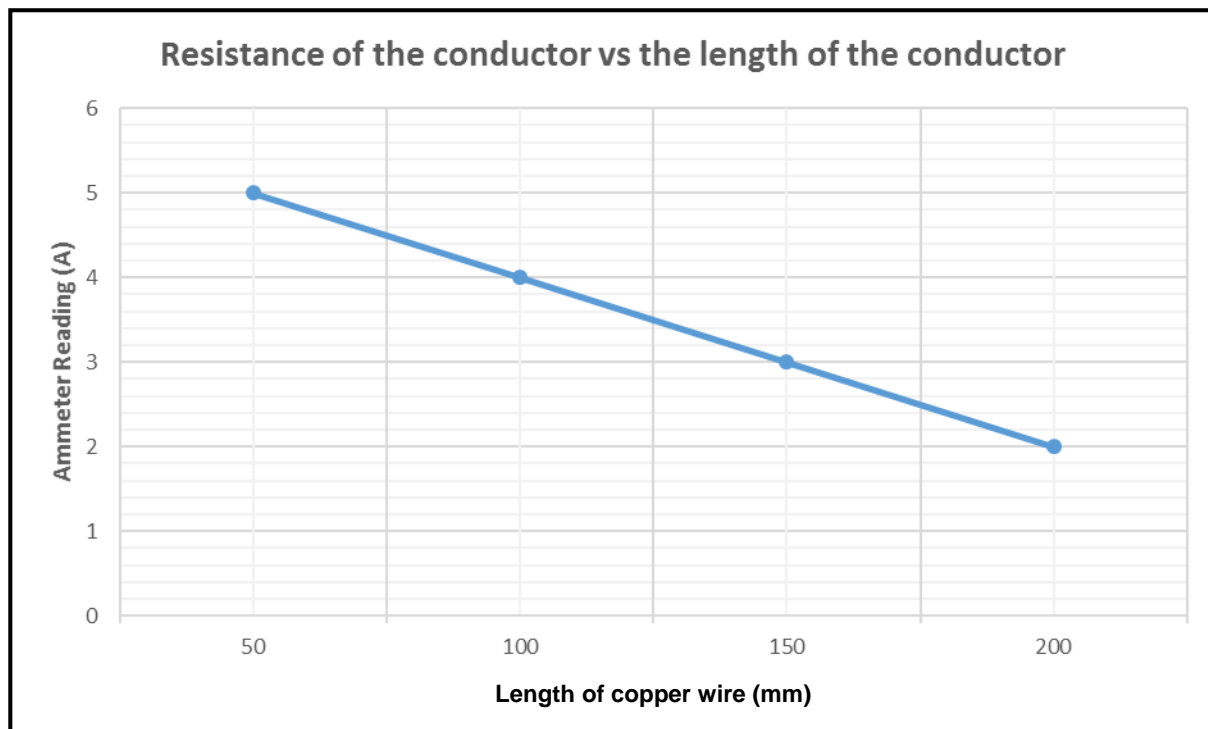
**QUESTION 5****CURRENT ELECTRICITY**

- 5.1 5.1.1 X – Voltmeter ✓ Y – Battery ✓ Z – Light bulb/Bulb ✓ (3)
- 5.1.2 Chemical energy to electrical energy ✓ (1)
- 5.1.3 In series ✓ (1)
- 5.1.4  $9 \text{ V} \div 2$  ✓  
= 4,5 V ✓ (2)
- 5.1.5 Bulb 1 will not glow ✓, removal of bulb 2 creates a gap in the circuit (in series). ✓ The path of the current will be incomplete/broken, and there will be no current flow. ✓ (3)
- 5.2 5.2.1 The community (children) would be in danger of being electrocuted ✓ should the cables be worn out and exposed. ✓  
(Any logical reason related to the dangers of illegal connections.) (2)
- 5.2.2 Illegal connections mean that people use electricity that they do not pay for and the service provider loses expected revenue, ✓ and this will also have an adverse impact on the economy because power stations will be working at a loss. ✓  
(Any other logical answer.) (2)
- [14]**

**QUESTION 6****RESISTANCE**

- 6.1 6.1.1 Length does not have any effect ✓ on resistance. ✓
- OR**
- Length has an effect ✓ on resistance. ✓
- (Any 1) (2)
- 6.1.2 Does length ✓ have an effect on resistance? ✓ (2)
- 6.1.3 Resistance ✓ (1)

6.2



- 1 Mark for the heading ✓
- 1 Mark for straight line ✓
- 2 Marks for correct scaling ✓✓
- 2 Marks for 2 correct points ✓✓

(6)  
[11]

## QUESTION 7

### COST OF POWER CONSUMPTION

7.1 7.1.1 Power rating in kW =  $1500 \div 1000$  ✓  
= 1.5 kW ✓

(2)

7.1.2  $12 \div 60 = 0,2$  hrs ✓

$199 \div 100 = 1,99$  ✓

Cost = power rating in kW x time x unit price

= 1,5 kW x 31 x 0,2 x 1,99 ✓

= R9.30 ✓ Mr Maloka's claim is correct ✓

(5)

7.2 7.2.1 Coal is a non-renewable energy source that can be exhausted or depleted. ✓/Burning of coal causes air pollution. ✓/Production of greenhouse gases ✓/Causes global warming. ✓/Uses a lot of water. ✓/ Causes water pollution. ✓ Destroys the environment or habitats. ✓

(Any 1)

(1)

- 7.2.2 Wind ✓  
 Falling water ✓  
 Waves ✓  
 Solar energy/Sun ✓  
 Nuclear energy ✓

(Any 1) (1)  
**[9]**

## QUESTION 8

### SPHERES OF THE EARTH

- 8.1 8.1.1 Interaction between Atmosphere and Hydrosphere. Water evaporates into the air. ✓ Groundwater seeps into the rocks. ✓ (2)
- 8.1.2 Interaction between Biosphere and Hydrosphere: Fish need the dam water to live in. ✓ Humans use water to generate electricity. ✓ (2)
- 8.1.3 Interaction between Biosphere and Lithosphere: Plants in the surrounding area use minerals from the soil. ✓ Humans use rocks to build dam walls. ✓ (2)
- 8.2 8.2.1 1 – Crust ✓  
 2 – Mantle ✓  
 3 – Outer Core ✓  
 4 – Inner Core ✓ (4)
- 8.2.2 Igneous rock ✓  
 Metamorphic rock ✓  
 Sedimentary rock ✓ (3)
- 8.2.3 Grains of sand compact ✓ together over a long period of time. ✓ (2)
- 8.3 8.3.1  $54 + 21 + 14 + 7 + 2 = 98$  ✓  
 $100 - 98 = 2\%$  ✓ (2)
- 8.3.2 Percentage (%) contribution to the greenhouse effect ✓ (1)
- 8.3.3 Carbon dioxide **OR** Methane ✓ (1)
- 8.3.4 CFC's ✓ (1)
- 8.3.5 Carbon dioxide – respiration ✓  
**OR**  
 Methane – decaying plants or manure/waste gases from cattle. ✓

(Any 1) (1)  
**[21]**

**QUESTION 9****MINING OF MINERAL RESOURCES**

- 9.1 9.1.1 Northern Cape Province ✓ (1)
- 9.1.2 On the surface ✓ (1)
- 9.1.3 A mixture ✓ consists of a variety of minerals. ✓  
**OR**  
 It is an impure substance. ✓ (Any 1) (2)
- 9.1.4 Using a magnet ✓ (1)
- 9.1.5 Removal of plants ✓ causing habitat loss for animals ✓/removal of  
 soil ✓ causing the topsoil to wash away ✓/ground/air/water pollution ✓  
 from chemicals used. ✓ (Any 1) (2)
- [7]**

**QUESTION 10****BIRTH, LIFE AND DEATH OF STARS**

- 10.1 As the stars grow older, their temperature decreases ✓ causing a change in  
 colour from blue to red. ✓ (2)
- 10.2 Supernova ✓ (1)
- [3]**

**TOTAL SECTION B: [80]**

**TOTAL: 100**