



**GAUTENG PROVINCE**

EDUCATION  
REPUBLIC OF SOUTH AFRICA

**GAUTENG DEPARTMENT OF EDUCATION  
PROVINCIAL EXAMINATION  
NOVEMBER 2017  
GRADE 9**

**NATURAL SCIENCES**

**MEMORANDUM**

**10 pages**

GAUTENG DEPARTMENT OF EDUCATION  
PROVINCIAL EXAMINATION

## NATURAL SCIENCES

## MEMORANDUM

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**SECTION A****MULTIPLE-CHOICE QUESTIONS****QUESTION 1**

- 1.1 C ✓ (1)
- 1.2 B ✓ (1)
- 1.3 A ✓ (1)
- 1.4 B ✓ (1)
- 1.5 A ✓ (1)
- 1.6 D ✓ (1)
- 1.7 A ✓ (1)
- 1.8 B ✓ (1)
- [8]**

**QUESTION 2****TERMINOLOGY**

- 2.1 Newton ✓ (1)
- 2.2 Electrolyte ✓ (1)
- 2.3 Resistor ✓ (1)
- 2.4 Ore ✓ (1)
- 2.5 Global warming ✓ (1)
- 2.6 Supernova ✓ (1)
- [6]**

**QUESTION 3****MATCHING COLUMNS**

- 3.1 C (Power surge) ✓ (1)
- 3.2 H (Power station) ✓ (1)
- 3.3 B (Ammeter) ✓ (1)
- 3.4 A (Gravitational force) ✓ (1)
- 3.5 E (Troposphere) ✓ (1)
- 3.6 D (Larva) ✓ (1)
- [6]**

**TOTAL SECTION A: [20]**

**SECTION B****ENERGY AND CHANGE****FORCE**

4.1 Forces can cause object to:

Start moving✓

To speed up✓

To change direction✓

To change shape✓

To rotate✓

(Mark any two correct answers) (2)

4.2 4.2.1 Tension force ✓ (1)

4.2.2 Compression✓ (1)

4.3 4.3.1 Magnetic force. ✓ (1)

4.3.2 **Photo A** – Magnetic fields are attracted at the poles as a result of strong forces of unlike poles. ✓✓

**Photo B** – Magnetic fields repel each other at the pole as a result of weaker forces at the like poles. ✓✓ (4)

4.3.3 Gravitational forces ✓ (1)

Electrostatic force ✓ (1)

**[11]**

## QUESTION 5

## SERIES AND PARALLEL CIRCUIT

- 5.1 5.1.1  $3V \times 4$   
 $= 12V$  (2)
- 5.1.2 The currents through the light bulbs 2 and 3 are equal to each other because they are connected in parallel. ✓✓ (2)
- 5.1.3 The current through the light bulb 1 is higher than the current in bulb 2. ✓✓ (2)
- 5.1.4 Light bulb 3 will go out / off. Because bulb 1 is connected in series, so if it blows there is a gap in the circuit ✓✓ (2)
- 5.1.5 It will continue to shine / burn. Because bulb 2 is connected in parallel, so if it blows there is still a path in which the current can flow. ✓✓ (2)
- 5.2
- Thickness of the conductor ✓
  - Length of the conductor ✓
  - Type of material ✓
  - Temperature of the conductor ✓ (Any two) (2)

**[12]**

**QUESTION 6****ELECTRICITY GENERATION IN SOUTH AFRICA**

- 6.1 6.1.1 Because there are no coal reserves in Western Cape. ✓ (1)
- 6.1.2 Uranium. ✓ (1)
- 6.1.3 Nuclear waste can cause  
- burns  
- cancer, and  
- genetic mutation ✓ (Any one) (1)
- 6.2 6.2.1 Sun ✓ / Solar energy (1)
- 6.2.2 No air pollution ✓ (1)
- 6.2.3 Water ✓ (1)
- 6.2.4 Renewable energy ✓ (1)
- 6.2.5 The up-and-down motion of waves can be converted into electrical energy. ✓ (1)
- 6.2.6 renewable ✓ (1)
- 6.2.7 Radioactive element ✓ (1)

**[10]**

## QUESTION 7

## COST OF ELECTRICAL POWER

7.1 Laptop✓ (1)

7.2 You can use a geyser blanket.✓  
Use a geyser timer.✓  
Switch the geyser on and off when required.✓ (2)

[Mark any two correct answers.]

7.3 Cost of energy use =  $kw \times h \times cost$   
=  $2 \times 3 \times 60c$ ✓✓  
360c✓

Total cost = R3, 60c✓ (4)  
[7]

**TOTAL SECTION B: [40]**

## SECTION C

## QUESTION 8

## EARTH AND BEYOND

## EARTH AS A SYSTEM

## 8.1

- Lithosphere and Hydrosphere ✓ ( Water erodes soil.)
- Atmosphere and Hydrosphere ✓ (Water evaporates from oceans becoming vapour in the atmosphere.)
- Lithosphere and atmosphere ✓ (Volcanoes erupt, shooting gases and dust into the atmosphere.)
- Biosphere and atmosphere ✓ (Plants give off oxygen during photosynthesis. Plants use carbon dioxide during photosynthesis.)
- Biosphere and Hydrosphere ✓ (Water is used by plants and animals.)
- Biosphere and Lithosphere ✓ (Plants derive water from the soil. Animals use water to sustain life.) (6)

- 8.2 8.2.1
1. Igneous rock ✓ (1)
  2. Sediment ✓ (1)
  3. Sedimentary rock ✓ (1)
  4. Metamorphic rock ✓ (1)
  5. Magma or Lava ✓ (1)

- 8.2.2 **Magma** is a hot melted rock. ✓  
**Igneous rock** is the rock that forms when Magma cools down. ✓ (2)

- 8.3 Heat ✓  
 Cold ✓  
 Water ✓  
 Wind ✓
- (Any three) (3)
- [16]**



## QUESTION 9

## MINING IN SOUTH AFRICA

- 9.1 9.1.1 (a) It generates revenue for a country. ✓✓  
It provides employment for people. ✓✓  
It provides opportunities for scientific and technological research. ✓✓  
(Any two) (4)
- (b) It changes the landscape around the site. ✓✓  
The waste products pollute the water, air and land. ✓✓  
It damages places with high value in tourism. ✓✓  
It damages places of cultural heritage. ✓✓  
Farming land and conservation areas are lost because mining uses a lot of land. ✓✓  
(Any two) (4)
- 9.1.2 There should be strict government laws that govern mining. ✓✓  
Old unused mines could be restored to their original condition. ✓✓  
There should be laws to govern pollution. ✓✓  
Guidelines should be drawn up to make sure that mining activities do not damage the environment of the surrounding communities. ✓✓  
(Any two) (4)
- 9.1.3 Troposphere ✓  
Stratosphere ✓  
Mesosphere ✓  
Thermosphere ✓ (4)
- 9.2 Global climate change would follow. ✓ E.g. the snow would melt, the rivers might dry up, the plants and animals would suffer from an increase in average temperature. ✓ (2)

**[18]**

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

10.1 The colour of a star is determined by age ( life cycle). ✓

OR

The colour of a star is determined by its temperature. ✓

(Any one)

(1)

10.2 Nebula ✓ → Protostar ✓ → Blue star ✓ → Red gaint ✓ → White dwarf ✓

(5)

[6]

**TOTAL SECTION C: [40]**