



GAUTENG PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

**GAUTENG DEPARTMENT OF EDUCATION
PROVINCIAL EXAMINATION
NOVEMBER 2016
GRADE 9**

NATURAL SCIENCES

LEARNER'S NAME: _____

GRADE: 9 _____

DATE: _____

QUESTION	1	2	3	4	5	6	7	8	9	10	11	TOTAL
LEARNER'S MARKS												
MAXIMUM	8	6	6	6	11	6	7	12	12	18	8	100

MARKS: 100
TIME: 2 hours

21 pages



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NATURAL SCIENCES

MARKS: 100

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INSTRUCTIONS AND INFORMATION

1. Write your name and class on the first page of the question paper.
2. Answer all questions on this question paper.
3. This question paper consists of SECTION A, SECTION B and SECTION C based on the prescribed content framework in the CAPS document.
4. Allocation of marks:

SECTION A: 20
SECTION B: 42
SECTION C: 38
5. This examination paper consists of eleven questions.
6. Follow the instructions of each question.
7. All drawings should be done in pencil and labeled in blue or black ink.
8. 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 circling, or placing a cross over the correct letter (A – D).

- 1.1 The SI unit to measure force is ...
- A Joules.
 - B Watts.
 - C Newtons.
 - D Volts. (1)
- 1.2 A rock that is rich in mineral deposits is known as ...
- A Sedimentary.
 - B Ore.
 - C Metamorphic.
 - D Igneous. (1)
- 1.3 A simple device that opens and closes a circuit is known as a / an ...
- A Discharge.
 - B Cell.
 - C Ammeter.
 - D Switch. (1)
- 1.4 A warming effect caused by the trapping of energy in the atmosphere is called ...
- A Climate change.
 - B Greenhouse gases.
 - C Global warming.
 - D Greenhouse effect. (1)

1.5 A pulling force that bodies exert on each other over a distance due to their masses is a/an ... force

- A Magnetic
- B Gravitational
- C Electrostatic
- D Attracting

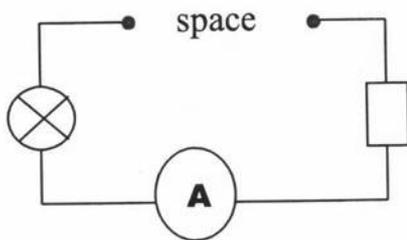
(1)

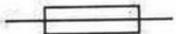
1.6 The lowest layer of the atmosphere, closest to the surface of the earth, is known as the ...

- A Mesosphere.
- B Stratosphere.
- C Troposphere.
- D Thermosphere.

(1)

1.7 The accompanying diagram shows an incomplete circuit. Which component should be connected in the space to make the lamp glow?



- A 
- B 
- C 
- D 

(1)

1.8 Which of the colours below indicates the hottest star?

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

(1)

(8)

QUESTION 2**TERMINOLOGY**

Give the correct scientific term for each of the following descriptions. Write only the term next to the question number (2.1 – 2.6) in the spaces provided.

- 2.1 Part of the earth that consists of a layer of gases around the earth's surface
_____ (1)
- 2.2 A safety device in a circuit that melts and breaks if the current exceeds a safe level
_____ (1)
- 2.3 The process by which minerals and fossil fuels are removed from the earth's crust
_____ (1)
- 2.4 A massive discharge or release of charge between the thunder cloud and the ground
_____ (1)
- 2.5 A huge cloud of gas and dust in the universe where stars are formed
_____ (1)
- 2.6 A device that produces electricity by converting chemical energy into electrical energy
_____ (1)
- (6)**

QUESTION 3
MATCHING ITEMS

Choose an item from **COLUMN B** that matches the statement in **COLUMN A**. Write only the letter (A – H) next to the question number (3.1 – 3.6) in spaces provided, for example, 3.7. K

COLUMN A	COLUMN B
3.1 Part of the earth that consists of all living things and their interactions with rocks, soil, air and water	A Power surge B Compression
3.2 Branches in the electricity grid experience an excess of electricity	C Biosphere D Current breaker
3.3 A contact force that pushes or squeezes an object into a smaller space	E Nuclear fission
3.4 The process in which impurities are removed from a mineral	F Earth leakage G Friction
3.5 A safety device where excess current is redirected into the ground	H Refining
3.6 A process in which atoms combine to create larger atoms and massive amounts of energy	

- 3.1 _____
- 3.2 _____
- 3.3 _____
- 3.4 _____
- 3.5 _____
- 3.6 _____

(6)

TOTAL SECTION A: [20]

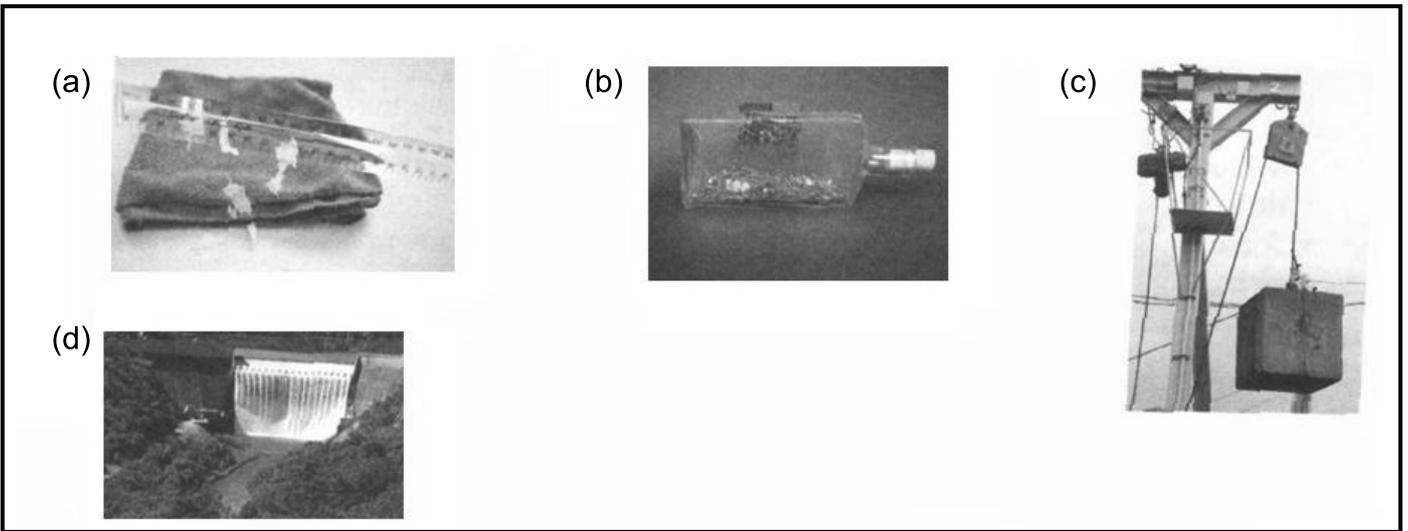
SECTION B

ENERGY AND CHANGE

QUESTION 4

FORCE

Study the photos below and state which type of contact or non-contact force is represented in a, b, c, and d.



- (a) _____
- (b) _____
- (c) _____
- (d) _____

(4)

4.2 Describe any TWO visible effects that a force can have on an object.

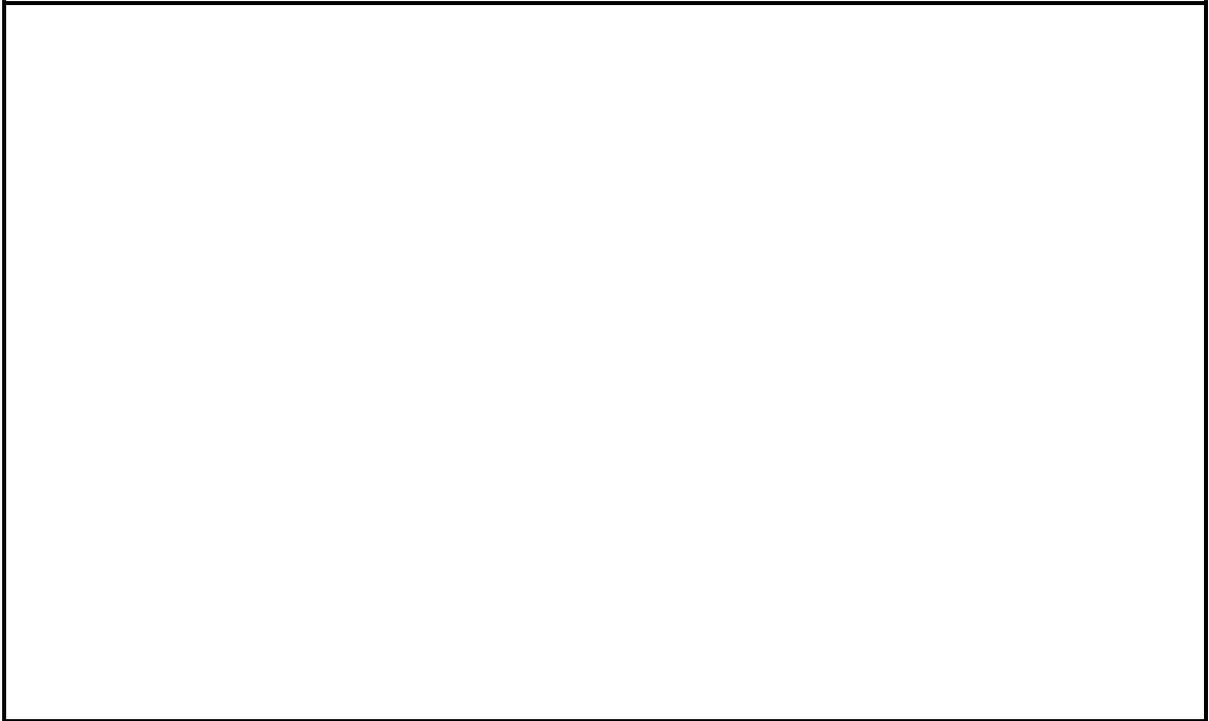
(2)
(6)

QUESTION 5**SERIES AND PARALLEL CIRCUITS**

Study the circuit below and answer the questions that follow.



5.1 Draw a circuit diagram to represent the circuit above.



(3)

5.2 What does the reading of a voltmeter tell you?

(1)

5.3 If another bulb is connected in parallel with the connected one, the reading on the voltmeter will not change. Explain why the reading will not change.

(2)

5.4 Will the reading on the voltmeter increase or decrease if another bulb is connected in series with the first one?

(1)

5.5 Give a reason for your answer to Question 5.4.

(2)

5.6 Mention TWO factors that affect the resistance of a metallic conductor.

(2)

(11)

QUESTION 6**SAFETY WITH ELECTRICITY**

Read the following case study and answer the questions that follow.

Doornbach informal settlement celebrates electricity provision

West Cape News, July 2012

There was much celebration in Doornbach, an informal settlement just outside of Cape Town, when the City switched on about 200 new electrical connections over the period of a few months in 2012. The illegal electricity connections had previously been the only supply of electricity to the area. Authorities often encounter fierce opposition when trying to cut down illegal electricity connections in informal settlements. But, the Doornbach residents immediately took it upon themselves to cut down the massive web of illegal wires in response to finally receiving formal, legal electricity provision.

Besides the mass of wires running through the informal settlement, many of the wires had been strung across Potsdam Road, the main road running through the area. This was very dangerous as the wires hung very low and would often catch on trucks passing through and snap. Fire threats and electrical shocks to passers-by and vehicles were also a safety concern. The use of legal electricity will also help to prevent shack fires as residents will rely less on candles and paraffin stoves.

A fifty-two-year-old Doornbach resident, celebrating the end of illegal connections in the settlement, said that she had lived there for 18 years and never received any municipal services from the city. The reason being that they had originally settled on privately owned land, which meant that the city could not, in terms of National legislation, install services on privately owned land. However, the city bought the land in May 2011, and Eskom could therefore begin the process of providing electricity to households in Doornbach. The fifty-two-year old was very excited about being able to use an electric iron and installing a refrigerator.

As a symbolic gesture, the residents took it upon themselves to remove the illegal wires. Many of the youth climbed up the dangerous makeshift poles in order to collect the wires which they would sell to scrap yards. Not everyone was celebrating the switching on of legal electricity connections in Doornbach. Many residents in neighbouring settlements, living in formal housing, were making money by selling and supplying electricity illegally to Doornbach. Street lighting has also been installed in Doornbach and it is hoped this will help to reduce the crime rate.

Lastly, the City of Cape Town extended their sincere thanks to the community of Doornbach, as without their support, involvement and cooperation, such a project would not have been possible.

6.1 After reading this case study, what do you think is the main reason that the people of Doornbach originally set up illegal connections?

(2)

6.2 What were some of the physical dangers of the illegal connections in Doornbach?

(2)

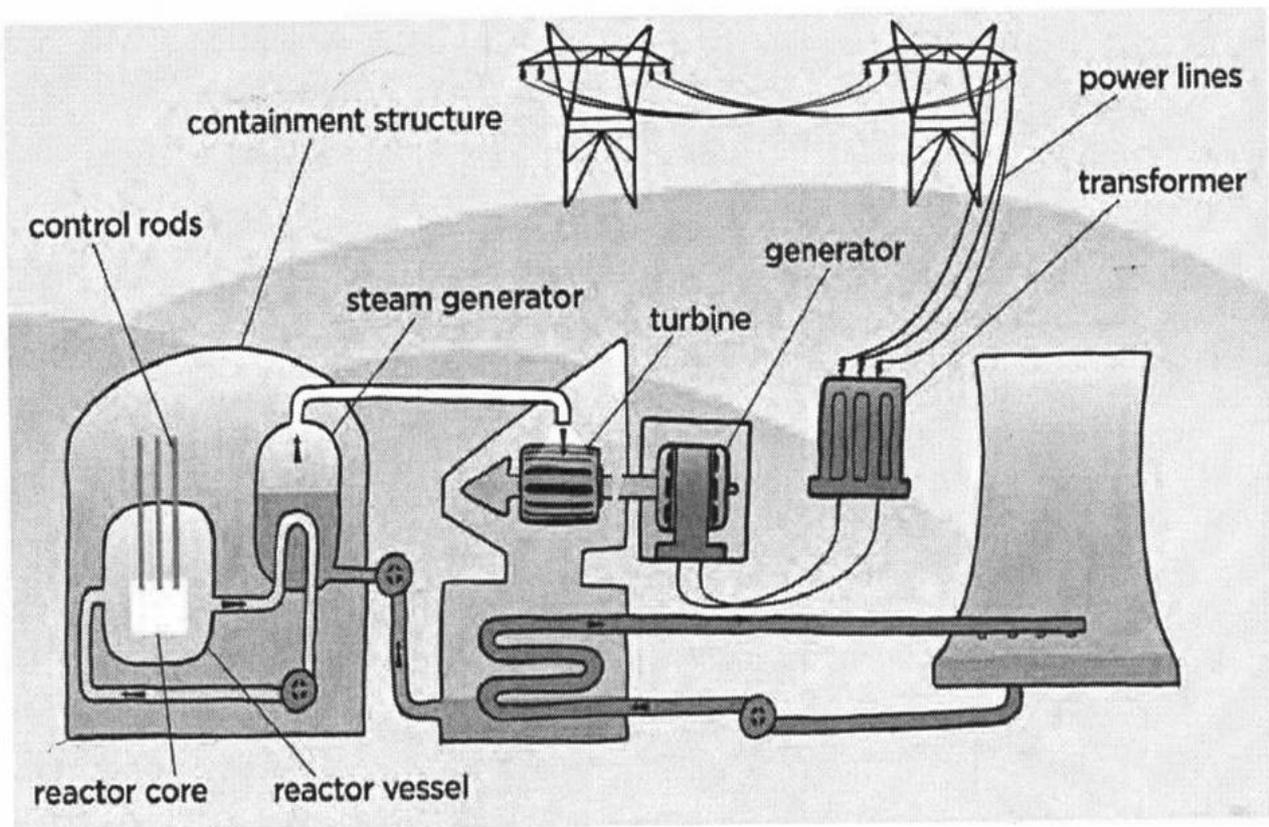
6.3 Aside from the physical dangers associated with these electrical connections, why else are the connections illegal?

(2)
(6)

QUESTION 7**POWER STATIONS AND THE NATIONAL ELECTRICITY GRID**

The electricity we use in our everyday lives is produced in power stations located in different areas of South Africa. Power stations use a system that generates electricity from a fuel source.

- 7.1 Study the diagram of a nuclear power station below and complete the flow diagram on the next page to explain how a nuclear power station produces electricity.



FLOW CHART

- Uranium is placed in the nuclear reactors.
- Nuclear fission takes place.
- A large amount of energy is released.



(2)



The hot steam causes the blades of a turbine to move.



(3)



The electrical energy is connected to the national electricity supply grid.

7.2 The nuclear waste is radioactive and needs to be properly disposed of so that it is not a danger to life.

Mention any TWO dangers that it can cause to life.

(2)
(7)

QUESTION 8**COST OF ELECTRICAL POWER**

Use the table below and answer questions that follow.

APPLIANCES	POWER RATING IN WATTS (W)
• Electric drill	520
• Electric kettle	2000
• Energy saving bulb	11
• Electric geyser	2000
• Normal light bulb	60

- 8.1 Draw a bar graph using the table above. Show the type of appliances along the horizontal axis (x-axis) and the power rating on the vertical axis (y-axis).

- 8.2 An 11 W energy saving bulb produces the same amount of light as a 60 W normal light bulb. What does this tell you about energy consumption?

(2)

- 8.3 How much would it cost to use the electric kettle of 2 000 W continuously for 2 hours if the municipality's unit cost of electricity is rated at 90c per kilowatt hour (kWh)?

Remember: Cost = power rating (kW) x number of hours x unit price of electricity in kWh

(3)

(12)

TOTAL SECTION B: [42]

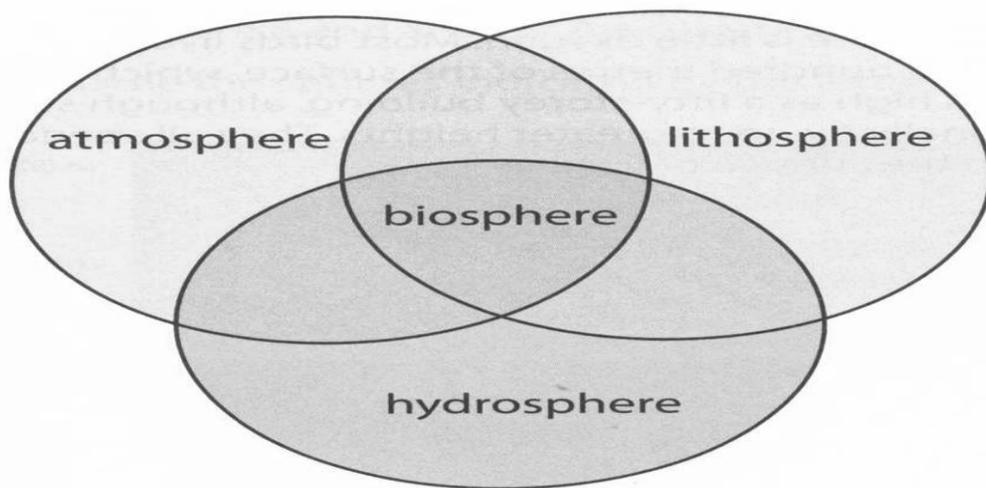
SECTION C

EARTH AND BEYOND

QUESTION 9

THE EARTH AS A SYSTEM

Refer to the diagram of an Earth-system as shown below to answer the questions that follow.



9.1 Why do the circles that represent the parts of an earth-system overlap one another in the diagram?

(2)

9.2 In which sphere is each of the following found?

9.2.1 All living things

(1)

9.2.2 All of the earth's water

(1)

9.3 What would happen to the earth's system if one of the spheres is destroyed?

(1)

9.4 The temperature at different heights above sea level in the troposphere (the temperature gradient) is above 1°C per 100 metres in still air.

9.4.1 The temperature at an altitude of 1 700 metres in Johannesburg is 26°C . Calculate the temperature at an altitude of 2 400 metres.

(6)

9.4.2 Will the temperature be higher or lower at the new altitude?

(1)
(12)

QUESTION 10**MINING IN SOUTH AFRICA**

Read the extract below and answer the questions that follow.

CONFLICT OVER PROPOSED MINING

A large mining company plans to open a new open cast (surface mining) copper mine near the Kruger National Park. The area in which the mine will be is a dry area, mostly used for cattle rearing, but in which some crops are also grown. There are many villages in the area, but not much work. A mine will be very close to a main road leading to a busy tourist entrance to the park. Environmental action groups are opposed to the opening of the mine. They are planning to write a letter urging the minister not to allow the mine to be opened.

10.1 Briefly explain what an open cast copper mine is.

(2)

10.2 Is copper an element or a compound?

(1)

10.3 In which layer of the earth is copper ore found?

(1)

10.4 Suggest any **THREE** reasons that the environmentalists could use in their letter to support their opposition to the mine.

(3x2) (6)

10.5 Suggest **TWO** reasons why the government might want to support the opening of the mine.

(4)

10.6 People have known how to extract metals like iron and copper from ore for thousands of years. Describe how ancient methods of extracting these metals remained the same for many years and how it is different in modern times.

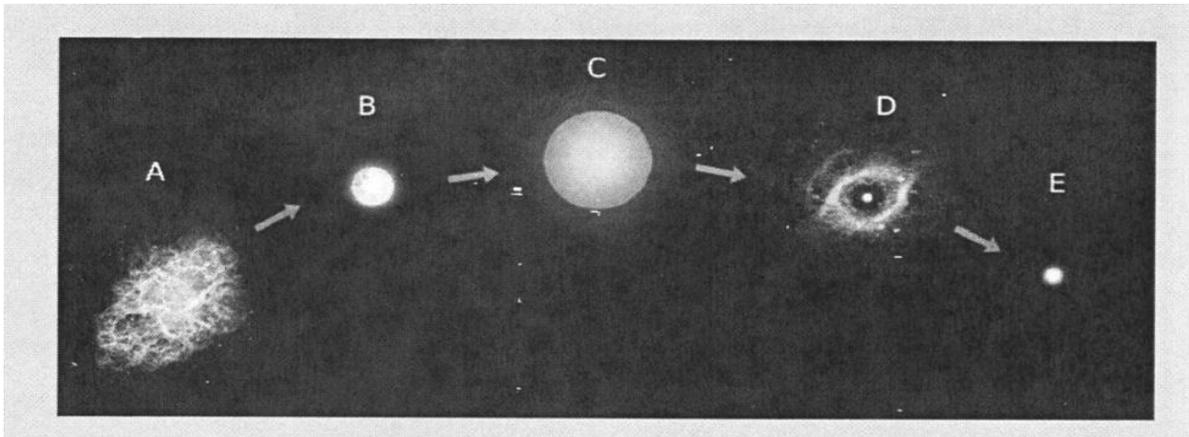
(4)

(18)

QUESTION 11

BIRTH, LIFE AND DEATH OF STARS

Study the following diagram showing a star's evolution



11.1 Label stages C and E.

C _____

E _____

(2)

11.2 What changes occur from stage B to form C?

(4)

11.3 Name the stage of a star's evolution in which our sun is.

(1)

11.4 Massive stars die in powerful explosions. What are these explosions called?

(1)
(8)

TOTAL SECTION C: [38]

TOTAL: 100

