LEJWELEPUTSWA DISTRICT

CONTROL TEST

GRADE 9

NATURAL SCIENCES

SEPTEMBER 2019

MARKS: 50

TIME: 1 HOUR

EXAMINERS: Mrs M.T. Moiloa and Ms M. Volschenk
CHIEF EXAMINER: Mr T.D. Thekiso
MODERATOR: Mr T.E. Mofokeng
TRANSLATOR: Ms M. Volschenk

This paper consists of nine pages.

INSTRUCTIONS

1 This question paper consists of FIVE questions.

2 The question paper is divided into TWO sections:

   a. SECTION A: 10 marks
   b. SECTION B: 40 marks

3 Number all your answers according to the numbering system used in this question paper.

4 In case of calculations, show ALL steps.

5 Round answers to TWO decimals, where applicable.

6 Write neatly and legibly.

SECTION A

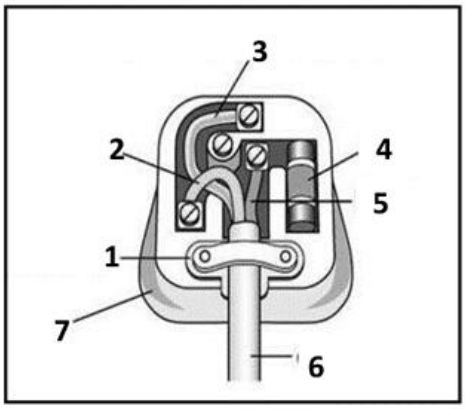
QUESTION 1

1.1 Various options (A to D) are provided as possible answers for questions 1.1.1 to 1.1.5. Choose the correct answer from the options given and write down the number and the letter of your choice, for example, 1.1.9 D.

1.1.1 The primary energy source used in Eskom power plants is …

A natural gas.
B uranium.
C coal.
D oil. (1)

1.1.2 In the diagram below, which number represents the cable that discharges the fault current to the ground?



A 2
B 3
C 4
D 5 (1)

1.1.3 Which one of the following groups of sources of energy is sustainable and has a very small negative impact on the environment?

A Sun-heated steam, waves in the sea and wind.
B Coal, nuclear fuel and wind.
C Earth oil, hydroelectric power and wave power.
D Solar energy, coal and falling water. (1)

1.1.4 … may cause burns, cancer and gene mutation if the skin is exposed to it due to its radioactive nature.

A Coal
B Falling water
C Steam
D Nuclear waste (1)

1.1.5 Two resistors are connected in parallel. The resistance of resistor 1 is R and the resistance of resistor 2 is 4R. If the main current is 9 A, what is the current through resistor 1?

A $\frac{9}{5}$ A

B $\frac{36}{5}$ A

C $\frac{5}{9}$ A

D $\frac{5}{36}$ A (1)

[5]

1.2 Choose a word from **COLUMN B** that matches the statement in **COLUMN A**. In your answer book, only write the LETTER (A - J) next to the question number (1.2.1 – 1.2.5), for example, 1.2.7 M.

COLUMN A	**COLUMN B**
1.2.1 A facility that generates electricity through different processes.	A. Voltmeter
1.2.2 An instrument used to measure potential difference.	B. Power Station
1.2.3 Equipment used to step up or step down the voltage.	C. Fuse
1.2.4 The rate of electrical energy supply.	D. Electrical power
1.2.5 A safety device that trips due to a current overload in a circuit.	E. Generator
	F. Ammeter
	G. Power surge
	H. Rheostat
	I. Transformer
	J. Circuit breaker

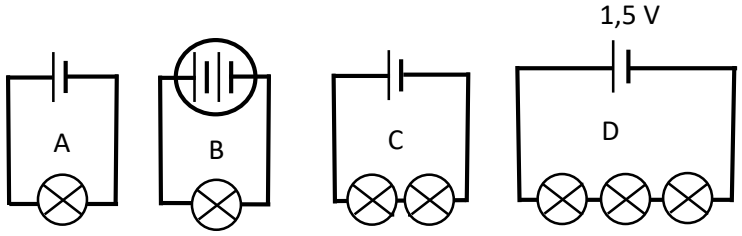
(5)

TOTAL SECTION A: [10]

SECTION B

QUESTION 2

2.1 Study circuits A, B, C and D and answer questions 2.1.1 to 2.1.5. All bulbs and cells are identical.



2.1.1 Which circuit has the highest resistance? (1)

2.1.2 In circuit B, what is the component that is circled? (1)

2.1.3 What is the purpose of the component circled? (1)

2.1.4 What is the voltage of each bulb in circuit D? (2)

2.1.5 In which circuit will the bulb/bulbs be the brightest? (1)

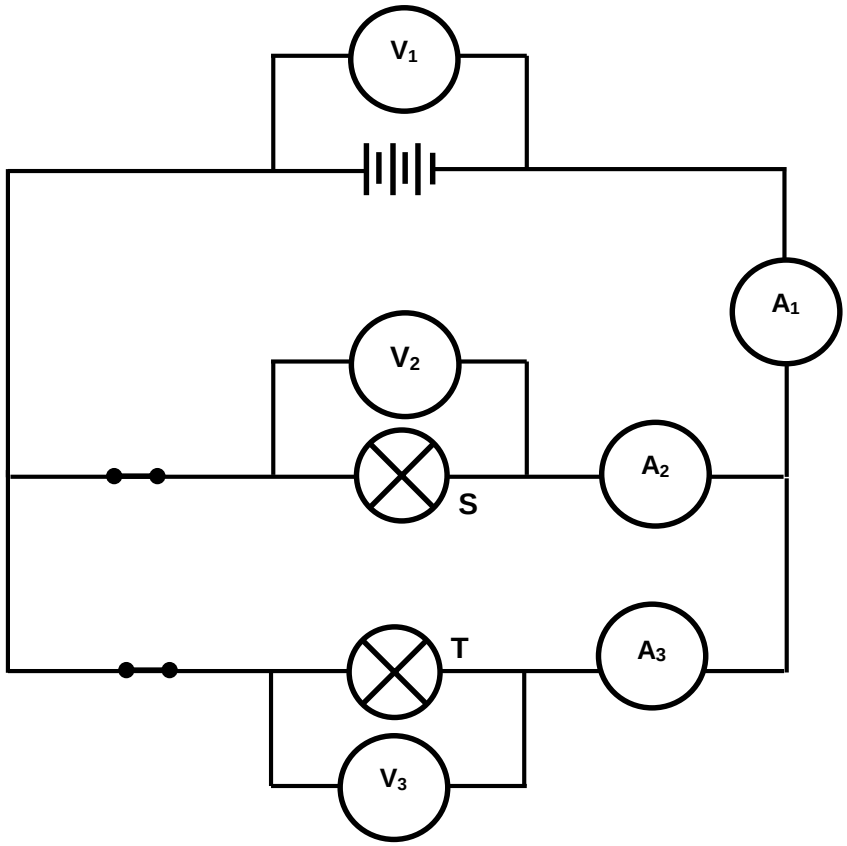
2.2 Mention TWO factors that can influence the resistance of a resistor. (2)

2.3 For ONE of the factors you chose in question 2.2, describe HOW it would affect the resistance of the resistor. (1)

[9]

QUESTION 3

Study the circuit diagram below and answer the questions that follow. Each cell has a potential difference of 1,5 V. The resistance of bulb S is R and the resistance of bulb T is 4R.



3.1 In which way are bulbs **S** and **T** connected? (1)

3.2 What is the reading on voltmeter V_1? (2)

3.3 What is the reading on voltmeter V_3? (1)

3.4 Which bulb will glow the brightest? S or T? (1)

3.5 What will happen to the reading on ammeter A_1 if bulb T is switched off? (1)

3.6 Explain your answer in question 3.5. (2)

[8]

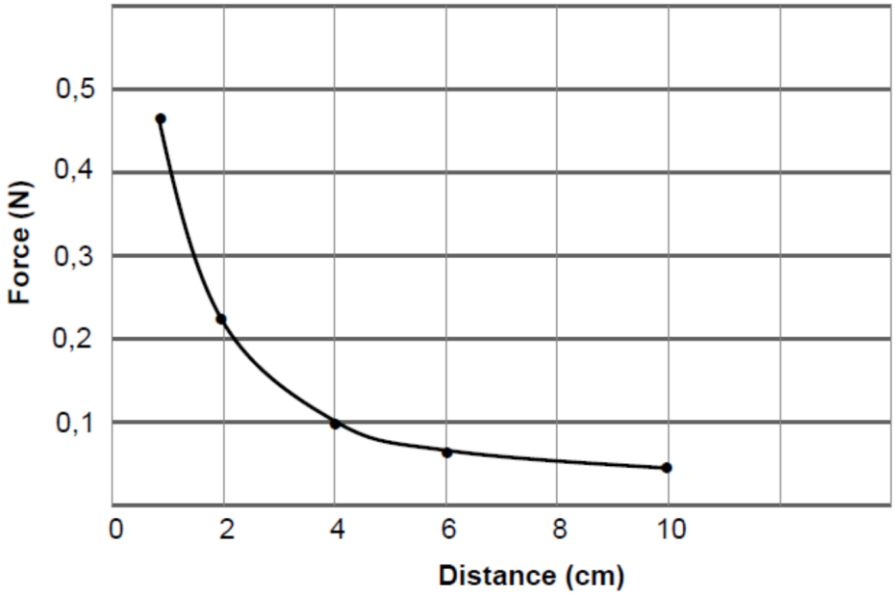
QUESTION 4

4.1 Two magnets are placed such that their north poles are facing each other.

4.1.1 Is the force two magnets exert on each other, a FIELD FORCE or a CONTACT FORCE? (1)

4.1.2 Draw in your answer book the magnetic field line pattern that can be observed between the two north poles of these magnets. (2)

4.2 The graph below shows how the magnetic force changes with the distance between two magnets.

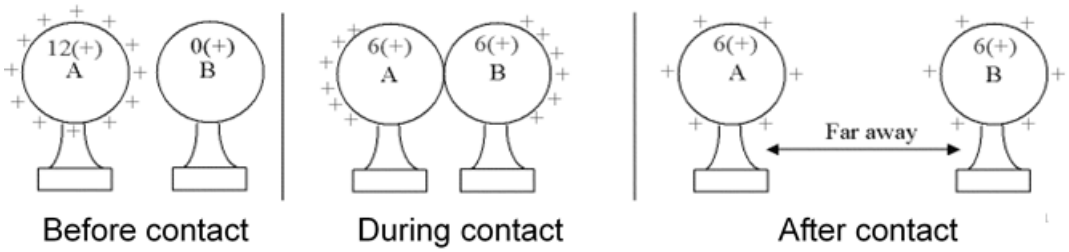


4.2.1 What is the magnitude of the magnetic force exerted by one magnet on another when the distance between the magnets is 4 cm? (1)

4.2.2 How far apart should the magnets be to experience a force of 0,15 N? (1)

4.2.3 What conclusion can be made based on the results in the graph? (2)

4.3 Two charged objects are shown below, before contact, during contact and after contact.



4.3.1 What is the name of the force that exists between the charged objects? (1)

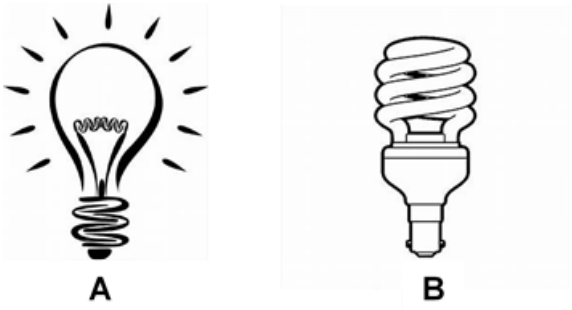
4.3.2 Which particles will be transferred from one sphere to another sphere when they make contact?
Write either PROTONS, NEUTRONS or ELECTRONS. (1)

4.3.3 Sphere B was neutral before contact. Did it have charged particles?
Write YES or NO. (1)

4.3.4 Notice how the position of the spheres changed after contact.
Suggest a reason why the distance between the spheres is so much bigger than before. (2)
[12]

QUESTION 5

5.1 Room 1 uses bulb A, which has a power rating of 0,06kW and which is switched on for 5 hours on any given day.
Room 2 uses bulb B, an 11 W LED bulb, which is switched on for 7 hours MORE than bulb A.
The unit price for electricity is R1,13 per kilowatt-hour.



5.1.1 Calculate the cost to use EACH of the bulbs.

Use the formula:
Cost = power rating of appliance x number of hours used x unit price of electricity
(5)

5.1.2 If the owner used bulb B in room 1, the cost would have been R0,06 or 6 cents. Calculate the amount that will be saved if bulb B is used in room 1. (2)

5.2 A flat iron is used for 30 minutes per day for 20 days in one month. Calculate the total number of **hours** the flat iron is used for during this time. (2)

5.3 Eskom usually shows the power alert advertisement below.

5.3.1 What seems to be the problem in the national electricity grid when this alert is shown? (1)

5.3.2 If the users are not following the alert, what will Eskom do? (1)
[11]

TOTAL SECTION B: 40
GRAND TOTAL: 50