FACULTY	:	Education
DEPARTMENT	:	Childhood Education
CAMPUS	:	SWC
MODULE	:	SCIENCE AND TECHNOLOGY FOR THE INTERMEDIATE PHASE. (SATINB3)
SEMESTER	:	Second
EXAM	:	January 2021

ASSESSOR(S)	:	MRS M PENN		
MODERATOR	:	DR A FERREIRA (NWU)		
DURATION	:	Take-home exam	**MARKS**	: 100

NUMBER OF PAGES: 4 PAGES

INSTRUCTIONS:

1. Answer ALL THE QUESTIONS.
2. Number your answers clearly.
3. This paper will be released on blackboard in the assessment folder 72 hours before the due date.
4. Your work should be typed in Times New Romans/Arial font, 1.5 spacing and must include a cover page with your details.
5. A declaration of authenticity must be submitted with your exam submission.

QUESTION 1: Electricity and Magnetism

The circuit shown in Fig. 1 below uses a 12 V battery.

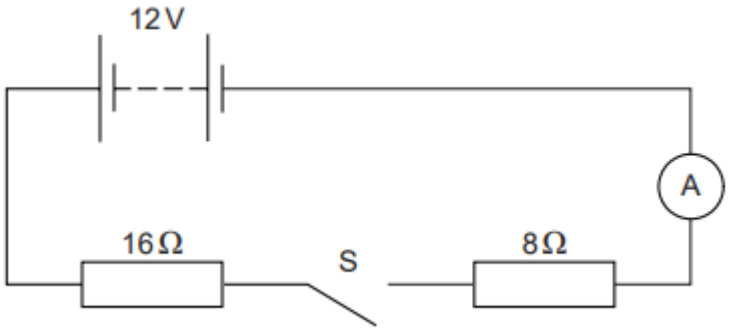

Fig 1. A simple circuit

1.1 When switch S is open as shown on Fig 1. What will be the reading on the ammeter? **(1)**

1.2 What is the potential difference (p.d) across switch S? **(1)**

1.3 The switch S is now closed, what will be the new ammeter reading? **(2)**

1.4 Calculate the p.d. across the 8 Ω resistor. **(2)**

1.5 The two resistors are now connected in parallel. Calculate the new reading on the ammeter when S is closed, stating clearly any equations that you use. **(4)**

1.6 Discuss some of the advantages and disadvantages of parallel and series circuits. **(10)**

1.7 Explain the formation, movement and uses of electromagnetic waves. **(10)**

[30]

QUESTION 2: Matter-Mixtures and pure substances

Matter is any object that has mass and occupies space.

2.1 The definition of matter has recently been extended to include massless particles such as quarks and leptons. What is the difference between quarks and leptons? **(2)**

2.2 Discuss five (5) characteristics of mixtures. **(10)**

2.3 Describe at least two (2) separation techniques through which the compositions of a saline solution can be individually separated. **(8)**

[20]

QUESTION 3: Atoms, molecules, compound and elements

Atoms consist of protons, neutrons and electrons. Protons and neutrons are collectively called Nucleons and are found in the nucleus (centre) of the atom

3.1 Describe how the arrangement of elements in the periodic table are related to the atomic structure of their atoms. **(8)**

3.2 Differentiate compounds from molecules. **(2)**

3.3 When a compound is formed, a chemical bond is made between the atoms of the different elements involved. How can you tell when this chemical change has taken place? **(10)**

[20]

QUESTION 4: Metals, non-metals and the pH scale

The elements of the periodic table can be divided into 3 main categories, metals non-metals and metalloids.

4.1 Explain the following properties in relation to metals, non-metals and metalloids.

4.1.1 Lustre

4.1.2 Malleability

4.1.3 Ductility

4.1.4 Conductivity

4.1.5 Solid **(15)**

4.2 For the dilution of an acid, acid is added into water and not water into acid. Explain why this is so. **(3)**

4.3 A student detected the pH of four unknown solution A, B, C and D as follows: 11, 5, 7 and 2. Predict the nature of each solution. **(4)**

4.4 Tabulate the differences in the characteristics of solutions A and D **(8)**

[30]

TOTAL: 100