INSTRUCTIONS AND INFORMATIONS

1. Answer all the questions
2. Read all the questions carefully
3. Number the answers accord to the numbering system used in this question paper
4. start each question on a new page
5. write neatly and legibly

QUESTION 1   Answer the following questions as requested

1.1	If the atomic number of Aluminium is 13, how many electrons will:		
	1.1.1 the Atom have		(1)
	1.1.2 the last shell occupy		(1)
	1.1.3 the second shell occupy		(1)
	1.1.4 the fourth shell occupy		(1)
	1.1.5. the first shell occupy		(1)
1.2	What is the difference between the following:		
	1.2.1. Nucleus and Neutron		(2)
	1.2.2. Electromotive force and Potential Difference		(2)
	1.2.3. Cell and Battery		(2)
	1.2.4. Resistance and Resistor		(2)
	1.2.5. Power and Energy		(2)
1.3	Why is the emf value greater than the pd across the load in a circuit		(1)
1.4	Explain and give one example for: what is meant by		
	1.4.1. Positive coefficient of resistance material		(2)
	1.4.2. Low coefficient of resistance material		(2)
			[20]

QUESTION 2   Answer the following questions as requested

2.1	Draw a neat labelled sketch showing how electrons are distributed in the shells of an Aluminium atom in reference to QUESTION 1.1		(5)
2.2	Sketch a fully labelled graph of Resistance against Temperature explaining the effect of temperature on the Resistance of material such as pure metals, alloys and insulators		(5)
2.3	Draw a fully labelled circuit diagram showing how you will connect a voltmeter across a Bulb to measure voltage and an Ammeter to measure current flowing through it. Note that the bulb is connected to AC source of 25V		(5)
			[15]

QUESTION 3   Solve the following problems

3.1	Calculate the cost to use a 7KW geyser for 9 hours if one unit of electricity cost 49 cents		(3)
3.2	A cell with and internal resistance of 0,25Ω is connected across a bulb. If the current flowing through the bulb is 0,75A and the voltage across the bulb is 1,9V, determine the emf of the cell		(3)
3.3	A heater with a power rating of 2,5KW is connected across a 220V supply. Calculate:		
	3.3.1. The current drawn from the supply		(2)
	3.3.2. The Resistance of the element		(2)
	3.3.3. The Energy consumed in 40 minutes in MJ		(3)
3.4	The resistance of a coil of copper wire at $0^{o}C$ is 50Ω. Calculate the resistance of the coil at $60^{o}C$. Take temperature coefficient of resistance of copper wire at $0^{o}C$ as $4,3\times10^{-3}$		(2)
			[15]
		TOTAL	**[50]**