##### FIRST TERM SCHEME OF WORKS

1. **SIMPLE A.C CIRCUIT I**
2. Nomenclature in A.C circuits
3. Peak and R.M.S values
4. Resistance in A.C circuit
5. Capacitance in A.C circuit
6. Inductance in A.C circuit
7. **SIMPLE A.C CIRCUITS II**
8. Reactance and Impedance
9. Series circuit containing Resistance, Inductance and Capacitance
10. Power in A.C circuit
11. **MODELS OF THE ATOM**
12. Concept of the atom
13. Various models of the atom; Thomson, Rutherford, Bohr, Electron cloud models
14. Limitations of physical models
15. **NUCLEUS I**
16. Radioactivity – Natural and Artificial

* Isotopes
* Radioactive elements
* Radioactive emissions
* Half-life and decay constant

1. **NUCLUES II**
2. Transformation of elements
3. Nuclear reaction

* Fission
* Fusion
* Nuclear energy

1. Application radioactivity
2. Nigeria nuclear energy program
3. **ENERGY QUANTIZATION I**
4. Energy levels in atoms

* Ground state
* Excited state
* Emission of light energy on return to ground state (atomic spectrum)

1. **ENERGY QUANTIZATION II**
2. Photoelectric effect
3. Einstein’s photoelectric equation and its explanation
4. X-rays

* Production
* Characteristics and properties
* Uses

1. **WAVE – PARTICLE DUALITY**
2. Wave nature of matter

* Electron diffraction

1. Particle nature of matter

* Photoelectric effect
* Compton effect

1. The uncertainty principle
2. **PHYSICS IN TECHNOLOGY**
3. Constructing a battery
4. Electroplating
5. **PHYSICS IN THE REAL WORLD (OR TECHNOLOGY) I**
6. Application of electromagnetic field

* Construction of a galvanometer, an electric motor and generators

1. **PHISICS IN REAL WORLD (OR TECHNOLOGY) II**
   * 1. Construction of a model transmission system using a transformer
2. **PHYSICS IN TECHNOLOGY**
   * 1. Need for use of machines in doing work (Easier; Quicker; More conveniently)
     2. Instances of use of machines (At home; In offices; In industries; In agriculture, In transportation; etc.)
     3. Repair and maintenance of machines

* Need for repairs of machines
* Need for regular maintenance of machine.
* Maintenance schedule of machines.

1. **REVISIONS**
2. **EXAMINATIONS**

**LESSON PLAN FOR WEEK ONE ENDING 15TH SEPTEMBER 2023**

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| --- | --- |
| **THEME:** | Field |
| **DATE**: | 11 – 09 – 2023 |
| **CLASS**: | SS3 |
| **TIME**: | 08:40am - 09:20am |
| **DURATION** | 40 MINUTES |
| **PERIOD** | 1 |
| **SUBJECT**: | Physics |
| **UNIT TOPIC:** | Simple A.C Circuits |
| **LESSON TOPIC:** | Nomenclature in A.C Circuits |

**SPECIFIC OBJECTIVE**: By the end of the lesson, learners should be able to

1. Define alternating current
2. Draw a diagram to show the variation of A.C with time
3. Obtain an expression for Root Mean Square Current and Voltage

**INSTRUCTIONAL RESOURCES:** Charts showing variation of alternating current and alternating voltage with time.

**LESSON PRESENTATION**

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| --- | --- | --- | --- |
| **STEP 1** | **PREVIOUS KNOWLEDGE:** The students are conversant with current and voltage having studied it under Ohm’s Law | | Students recall. |
| **STEP 2** | **EXPLORATION:**  The teacher arouses the students’ interests by telling them part of reason why electric is restored and interrupted immediately is abnormality in the frequency of the A.C signal. | | Students make attempt to answer the questions. |
| **STEP 3** | **DISCUSSION:**  ***NOMENCLATURE IN A.C CIRCUITS***  **A.C Circuit**  This is path for the flow of alternating current.  **Alternating Current**  Alternating Current (A.C) is one which varies sinusoidally or periodically, in such a way as to reverse its direction periodically. It travels as a sinusoidal wave completing one half cycle positive and half cycle negative. It is represented by:  Where, is the instantaneous value of current (i.e magnitude of current at any instant of time, t), is the peak value or maximum value (or amplitude) of alternating current (A.C), is the angular velocity or angular frequency of the A.C measured in, while is the phase angle of the A.C.  Recall that  Thus,  Where, is the frequency measured in Hertz (). Also alternating voltage can be represented by  Which is also equal to  **Peak and R.M.S values of A.C**  Alternating Current (or Voltage) varies sinusoidally, as shown in the fig below, which is a sine waveform. The amplitude or peak value of the current (or voltage) (or is maximum numerical value of the current (or voltage)  *Fig 1.1: Variation of alternating current or voltage with time.*  **Root Mean Square (R.M.S)**  The Root Mean Square Current (or Voltage) is that steady current (or voltage) which will generate the same quantity of heat in a given resistance at a given time. It is represented by (or . The Root Mean Square value is the effective value of current (or voltage).  The Root Mean Square is related to the peak or maximum value by the equation:  Also  Note that the ***moving iron and hot wire meters measure the average value of the square of the current (mean square current).*** They are calibrated in such a way as to indicate the R.M.S current directly. Thus, most A.C meters read the effective or R.M.S values. The average value of an A.C Current or Voltage is zero.  **Mean Value or Average Value of A.C**  The mean value or average value of an A.C, over any half cycle is defined as that value of steady current which would send the same amount of charge through a circuit in the time of half cycle as sent by the A.C through the same circuit, in the same time.  Mathematically, the ***mean value or average value of an Alternating Current*** is given by:  Similarly, ***mean or average value of an Alternating Voltage*** is given by: | | Students listen attentively and take down notes. |
| **STEP 4** | **APPLICATION:**  The r.m.s value of current is given as: , where I, is in ampere and t is in seconds. Find the:   * + 1. Peak value of the current     2. Frequency of the A.C supply   **Solution**  Given and comparing it  We have the following  Thus, peak value of current is 3 A  , . Thus, the frequency of the A.C supply is 30Hz. | | Students ask questions on the topic which the teacher answers. |
| **STEP 5** | **EVALUATION:** The teacher evaluates the students using the following:   1. Define alternating current? 2. What kind of waveform is the variation of A.C with time? 3. What is the relationship root mean square current and the peak current. | | The students answer the questions. |
| **ASSIGNMENT**   1. State any three advantages of moving iron instruments.   **References**  **Extensive physics for Senior Secondary Schools and Colleges, by OSINUBI SAHEED et al. New School Physics for SS2 by M.W ANYAKOHA {Ph D}. Senior Secondary Physics for SS2 by P. N OKEKE et al.** | |  |