

PHYSICS FORM 5 2009-2010

Textbooks: *Physics for You, Graded Examples for O Level and Teacher's Notes*

FIRST TERM

1. *Electrical charge and current electricity* (p. 241-274)

Positive and negative electric charges: production of charge, interactions between similarly charged, oppositely charged and neutral materials. Electrostatic induction. Forces between charged objects.

Quantity of charge, current as a rate of flow of charge, the coulomb and the ampere. The conservation of current in circuits.

Direct and alternating current.

Emf (p. 252), potential difference. The volt (p. 261)

Ohm's law (p. 253). Relationship between voltage and the current for ohmic and non-ohmic devices e.g. metal wires, filament lamps, diodes. Measurement of resistance using ammeter and voltmeter (p. 250-252)

Definition of resistance as V/I measured in ohms.

Power and Energy: the watt, the kilowatt hour (p. 116).

Electric Calorimetry

Simple d.c. circuits, resistors combined in series and in parallel. Principles of house wiring (p. 255), fuses (p. 268).

Experiments to investigate:

- i. the properties of individual circuit elements.
- ii. Variation of resistance with temperature for different devices.
- iii. The effects of length and cross-sectional area of resistance of a conductor.
- iv. The use of oscilloscope as a fast response voltage/Time graph producer.

2. *Magnetism and Electromagnetism* (p. 278-295)

Permanent magnets and electromagnets.

The magnetic effect of a steady current. Magnetic field lines, magnetic flux patterns around a straight wire, and a solenoid.

3. *Electronics*

Resistors, fixed and variable. Light dependent resistors (LDR) (p. 314)

Thermistors (p.317)

The semiconducting diode. Light emitting diodes (LEDs) (p. 316)

Experiments to include:

- i. qualitative investigations about LDR (p. 322)
- ii. variation of temperature and resistance of a thermistor.
- iii. Investigations involving LED.

SECOND TERM

The force on a current conductor in a magnetic field. Simple D.C. motor.

Electromagnetic induction, simple experiments to demonstrate the effect of the rate of cutting magnetic flux on induced e.m.f. The dynamo (p. 300)

Principle and use of transformers (p. 302)

Experiments to demonstrate:

- i. the magnetic effect of current and number of windings using electromagnets.
- ii. that induced currents increase when the rate of cutting of flux increases.

4. Atomic Physics and Radioactivity (p. 338-353)

The nuclear model of the atom: relative size, mass and charge of proton, neutron and electron.

Isotopes, nucleon number/proton number notation.

Radioactivity: properties of α , β , γ radiation. Detection of radiation, count rate, background radiation, applications of radiation including health and safety.

Radioactive decay: Half-life, transmutation of the elements.

Penetration, ionising ability and deflection in magnetic fields of the three types of radiation.

G. M. tube detectors, Cloud chamber. Half-life, carbon dating.

Simple considerations. Uses of radioactive isotopes and how these uses relate to their properties.

THIRD TERM

Exams

Assessment Mark:	Homework
	Classwork
	Participation in class
	Experiment analysis