Physics Theory 1st term

Ss3

1. Define electromotive force (b) state (i) the principle of operation of a potentiometer (ii) two advantages of potentiometer has over a voltmeter (c) List two factors which determine the magnitude of an induced emf in a coil (ii) A current of 5.4A passes through a straight wire in a uniform magnetic field of flux density 2 x 10T. Calculate the the force per unit length exerted on the wire when it is inclined at 30° to the field
2. A sailor observes that his mariners’ compass reads N10°W at a place where the angle of declination is N15°W. Calculate the true bearing of his place (ii) A proton is fired into a uniform magnetic field B of magnitude 0.80T with a speed of 350m/s at an angle of 30° to B. calculate the force of the proton [ charge on proton = 1.6 X 10⁻¹⁹]
3. Distinguish between perfectly elastic collision and perfectly inelastic collision (ii) A stone is projected vertically upward with a speed of 30m/s from the top of a tower 50m. Neglecting air resistance, determine the maximum height it reached from the ground [g = 10m/s²]
4. When a lead-acid accumulator is fully charged, evolution of gases occurs at the electrodes. Name these gases and the respective electrodes at which they are given off.
5. State 2 factors which affect the mass of elements deposited during electrolysis (ii) list two non-electrolytes (iii)
6. List two examples of examples each of substances with (i) low viscosity (ii) high viscosity
7. What is meant by cations (ii) Draw and label an electrolytic cell (ii) State Faraday’s second law of electrolysis (b) An electric charge of 9.6 X 10⁴C liberates 1 mole of a substance containing 6.0 X 10²³ atoms. Determine the value of the electronic charge
8. State the dimension of the following (i) acceleration (ii) pressure (iii)density (iv) acceleration (v) energy (vi) volume
9. In an electrolysis experiment, the ammeter records at steady current of 1A. the mass of copper deposited in 30 minutes is 0.66g. calculated the error in the ammeter reading [ECE = 0.00033g/C]