Question Three

A proton with speed of 8×10^6 m/s along the x axis it enters a region where there is a fixed of magnitude 25 Tesla directed at an angle of 60^0 to the x axis and lying in the xy plane calculate (i) Initial magnetic force (ii) acceleration of the proton. (3,2mks)

b) A rectangular coil of dimension 5.40cm x 8. 50cm consists of 25 turns of wire the coil carries a current of 15 mA. Calculate (i) the magnitude of magnetic Moment (ii) the magnitude of the torque give acting on the loop if the magnetic field is o.35T (3,2mks)

c) Explain five ways of increasing induced emf which cause induced current in electromagnetic induction (5mks)

d) State five ways of reducing power loss in transformers (5mks)

Question Four

a) Explain four Maxwell wonderful equations 0f free space in general form (8mks)

b) Calculate the Maximum kinetic energy of protons in a cyclotron of radius 0.5m in a magnetic field of 0.35 T. (4mks)

c) Explain the Lorentz force (4mks)

d). A rectangle copper strip 1.5. cm wide and 0.1 cm thick carries a current of 5 A 1.2 T magnetic field is applied perpendicular to the strip find the hall voltage (4mks)

Question Five

a) Explain four properties of electromagnetic wires (8mks)

b) A toroidal winding carrying a current of 5 A is wound with 300 turns/m of wire the core is iron which has a magnetic permeability of 500 μ_0 under the condition. Find (i) H and (ii) B inside the iron core. (3,2mks)

c). State two faraday's laws of electromagnetic induction
(3mks)

d) A long wire of resistance R, radius a and length l carries a constant current I calculate the poynting vector (3mks)