19EET201-Field Theory
Question Bank

UNIT- III

MAGNETOSTATICS

PART- A (2 MARKS)

1. State Biot –savarts law.

2. State Ampere circuital law

3. Write the relation between magnetic flux density and field intensity

4. Write the relation between relative permeability and suspectibility

5. Define magnetic flux density

6. Write down the magnetic boundary conditions.

7. Give the force on a current element.

8. Define magnetic moment.

9. State Gauss law for magnetic field.

10. What is magnetic susceptibility

11. Define magnetic dipole.

12. Give torque on closed circuits

13. Define magnetization.

14. List the types of magnetic materials

PART- B

1. Derive the expressions for magnetic field intensity due to finite and infinite line

2. Derive the expressions for magnetic flux intensity due to solenoid of the coil.

3. Derive the expressions for magnetic field intensity due to toroidal coil and circular coil.

4. Derive an expressions for energy stored and energy density in magnetic field.

5. (a) Derive an expressions for self inductance of two wire transmission line.

5. (b) Derive an expressions for force between two current carrying conductors.

6. (a) Derive the expression for torque developed in a rectangular closed circuit carrying current I a

uniform field.

6.(b) An iron ring with a cross sectional area of 3cm square and mean circumference of 15 cm is wound with 250 turns wire carrying a current of 0.3A.The relative permeability of ring is 1500 . calculate the flux established in the ring.

7. Explain Magnetic materials and scalar and vector magnetic potentials.

8. Derive the expressions for boundary conditions in magnetic fields.

9. A solenoid 25cm long ,1cm mean diameter of the coil turns a uniformlyDistributed windings of 2000 turns .the solenoid is placed in uniform field of 2 tesla flux density. a current of 5a is passed through the winding.Determine the

(i) Maximum torque on the solenoid&

(ii) Maximum force on the solenoid

(iii) Compute the magnetic moment on the solenoid.

10 (a).Derive the expression for co-efficient of coupling in terms of mutual and self inductance.

10 (b). Calculate the inductance of a solenoid of 200 turns wound tightly on a cylindrical tube of 6cm diameter .The length of the tube is 60cm and the solenoid is air.

11 (a) Define and explain biot –savart law .

11 (b) Find H at the centre of an equivalent triangular loop of side 4m carrying current of 5A.