SNS COLLEGE OF TECHNOLOGY

(*An Autonomous Institution*)

COIMBATORE-35

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

19EET201-Field Theory

Question Bank

UNIT- II

ELECTROSTATICS

PART- A (2 MARKS)

1. State coulombs law.
2. State Gauss law for electric fields
3. Define electric flux & electric flux density
4. Define electric field intensity
5. Name few applications of Gauss law in electrostatics
6. Define potential difference.
7. Define potential.
8. Give the relation between electric field intensity and electric flux density.
9. Give the relationship between potential gradient and electric field.
10. Define current density.
11. Write down the expression for capacitance between two parallel plates.
12. State point form of ohms law.
13. Define dielectric strength.

PART- B

1. State and proof gauss law .and explain applications of gauss law.
2. Drive an expression for the electric field due to a straight and infinite Uniformly charged wire of length ‘L’ meters and with a charge density of + c/m at a point P which lies along the perpendicular bisector of wire.

3 . (a) Explain poissons and lapace’s equations.

3. (b) A uniform line charge L =25Nc/m lies on the x=3m and y=4m in free space . Find the electric field intensity at a point (2,3,15)m.
4. A circular disc of radius‘a’ m is charged uniformly with a charge density of c/ m2.find the electric field at a point ‘h’ m from the disc along its axis.

5 (a).Define the potential difference and absolute potential. Give the relation between potential and field intensity.

5.(b) A circular disc of 10 cm radius is charged uniformly with a total charge10-10c.find the electric field at a point 30 cm away from the disc along the axis.

6. Derive the boundary conditions of the normal and tangential components of electric field at the inter face of two media with different dielectrics.

7. Derive an expression for the capacitance of a parallel plate capacitor having two dielectric media.

8. Derive an expression for the capacitance of two wire transmission line.

10Drive an expression for energy stored and energy density in electrostatic field.(a) Derive an expression for capacitance of concentric spheres.10 (b) Derive an expression for capacitance of co-axial cable.

11 (a) Explain and derive the polarization of a dielectric materials.

11 (b) List out the properties of dielectric materials.

12. The capacitance of the conductor formed by the two parallel metal sheets, each 100cm2,in area separated by a dielectric 2mm thick is , 2×10-10 micro farad .a potential of 20KV is applied to it . find

(i) Electric flux

(ii) Potential gradient in kV/m

(iii) The relative permittivity of materials

(iv) Electric flux density.

13. (a) Derive an expression for series and parallel plate capacitor.

13. (b) Given that potential V=10sincos/r2 find the electric flux density D at (2,/2,0)