SNS COLLEGE OF TECHNOLOGY

(*An Autonomous Institution*)
COIMBATORE-35
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

23EET201-Electromagnetic Fields
Question Bank

UNIT- I
INTRODUCTION

PART- A (2 MARKS)

1. What are the source of electric field and magnetic fields?

2. Give any three coordinate systems.

3. Express the value of differential volume in rectangular and cylindrical Co-ordinate systems

4. Write expression for differential length in cylindrical and spherical co- ordinates.

5. What is physical significance of divergence of D.

6. Express the divergence of a vector in the three system of orthogonal Co-ordination.

7. State divergence theorem.

8. State Stoke's theorem.

9. How is the unit vectors defined in three coordinate systems?

10.   Verify the vector =4 -2 + 2 , =-6 +3 -3 are parallel to each other.

11.   Find the unit vector extending from the origin toward the point P(3,- 1,-2)

12.   Define divergence and its physical meaning.

13.   List the sources of electromagnetic fields.

14.   Points P and Q are located at (0,2,4)and (-3,1,5).Manipulate the distance vector from P to Q.

15.   How can a vector field be expressed as the gradient of scalar field?

PART- B

1 (a) The electric field in a spherical co-ordinate is given by E=(r/5)ar. Show that closedE.dS=(.E)dv.

1(b) State and proof divergence theorem

2. Check validity of the divergence theorem considering the field D=2xy ax +x2ay c/m2 and the rectangular parallelepiped formed by the planes x=0,x=1,y=0,y=2 &z=0,z=3.

3. A vector field D=[5r2/4]Ir is given in spherical co-ordinates. Evaluate both sides of divergence theorem for the volume enclosed between r=1&r=2.

4. Given A= 2r cosIr+rI in cylindrical co-ordinates .for the contour x=0 to1 y=0 to1 , verify stoke's theorem

5. Explain three co-ordinate system.

6. Determine the divergence of these vector fields

i. P=x2yz ax+xy az

ii. Q=sin a+2z a+zcos az

iii. T=(1/r2)cos ar + r sincos a + cos a
 Discuss about curl of a vector
8. Derive an expression for curl of a vector
9.State stoke's theorem
10. Define divergence, gradient, curl in spherical co-ordinate system with mathematical expression
11. Prove that divergence of a curl of a vector is zero ,using stoke's theorem
12. Show that over the closed surface of a sphere of radius B,ds =0
13.Show that the vector E = (6 xy + z3) ax+ (3x2 - z) ay+ (3xz2 – y) az is Irrotational and find its scalar potential.
14. Given point P(-2,6,3) and = y + (x + z) , express P and in cylindrical coordinates.
15.State and prove divergence theorem.
16. Analyse the electric field intensity produced by a point charge distribution at P(1,1,1) caused by four identical 3nc point charges located at P1(1,1,0), p2(-1,1,0),P3(-1,-1,0) and P4(1,-1,0)
17. Mention the criteria for choosing an appropriate coordinate system for solving a field problem easily. Explain with an example.
18.Generalize the classification of vector fields. ii) If B = y + (x + z) and a point Q is located at (-2, 6, 3), express (1) the point Q in cylindrical and spherical coordinates; (2) in spherical coordinates.
19. With neat diagram, explain the spherical system with coordinates(R,Θ,φ).
20. Write short notes on gradient, divergence, curl and stokes theorem.