R19

Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations February 2022
ELECTROMAGNETIC FIELDS
(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1 a Given the two coplanar vectors A= 3 a_x + 4 a_y - 5 a_z and B= -6a_x +2 a_y +4 a_z. Obtain the unit vector normal to the plane containing the vector A and B   6M

   b The Three fields are given by A=2a_x -a_z, B= 2 a_x-a_y+2a_z, C= 2a_x-3a_y +a_z. Find the scalar and vector triple product.   6M

OR

2 If B= y a_x + (x+z) a_y and a point Q is located at (-2,6,3) express.1 The Point Q in cylindrical and spherical co-ordinates and 2) B in spherical coordinates   12M

UNIT-II

3 a Find E at (0,0,2) m due to charged circular disc in x-y plane with $\square$s=20 n C/m_2 and radius 1m.   6M

   b A circular disc of 10 cm radius is charged uniformly with total charge of 100$\square$c . Find E at a point 20cm on its axis.   6M

OR

4 a Two pint charges 1.5nC at (0,0,0.1) and -1.5nC at (0,0,-0.1) are in free space. Treat the two charges as a dipole at the origin and find the potential at p(0.3,0,0.4)   6M

   b In free space V= $x_2y(z+3)$. Find E at (3, 4, -6) and The charge within the cube 0<x,y,z<1.   6M

UNIT-III

5 Explain the boundary conditions of two perfect dielectrics materials.   12M

OR

6 Explain the boundary conditions between conductor and free space.   12M

UNIT-IV

7 Derive the expression for self-inductance of solenoid, toroid and coaxial cable.   12M

OR

8 Using Biot-savart's law. Find $\vec{H}$ and $\vec{B}$ due conductor of finite length.   12M

UNIT-V

9 Derive the equation of Continuity for time varying fields.   12M

OR

10 Derive an expression for motional and transformer induced emf.   12M

*** END ***