Assignment: 1

1. Explain cylindrical coordinate system in brief. Also write the equations of differential length, differential surfaces and differential volume elements.
2. Obtain the spherical co-ordinates of 10 āx at the point P(x= - 3, y = 2, z = 4)
3. Given the points A(x=2 ,y=3 ,z=-1) and B (r=4 , θ=25 ,Φ=120) Find (a) The spherical co-ordinates of A (b) The Cartesian co-ordinates of B (c) The distance from A to B.
4. Let each of the vectors A= 5ax –ay +3az, B= -2ax +2ay +4az and C= 3ay-4az extend outward from the origin of a Cartesian coordinate system to points A, B and C respectively. Find a unit vector directed from point A toward: (a) to the origin; (b) point B; (c) appoint equidistance from B and C on the line BC; (d) Find the length of the perimeter of the triangle ABC.
5. Given points A(x = 2, y = 3, z = -1) and B(ρ= 4, Φ = -50, z = 2), find a unit vector in cylindrical coordinates at point B directed towards point A.
6. Derive the equation of total electric field intensity in vector form due to infinite uniform sheet charge distribution in free space.
7. A dielectric-free space interface has the equation 3x + 2y + z = 12 m. The origin side of the interface has εr1 = 3 and E1 = 2āx + 5āz (V/m). Find E2.