

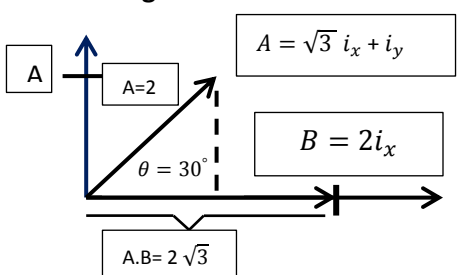
Department of Electrical Engineering
Assignment
Date: 14-04-2020

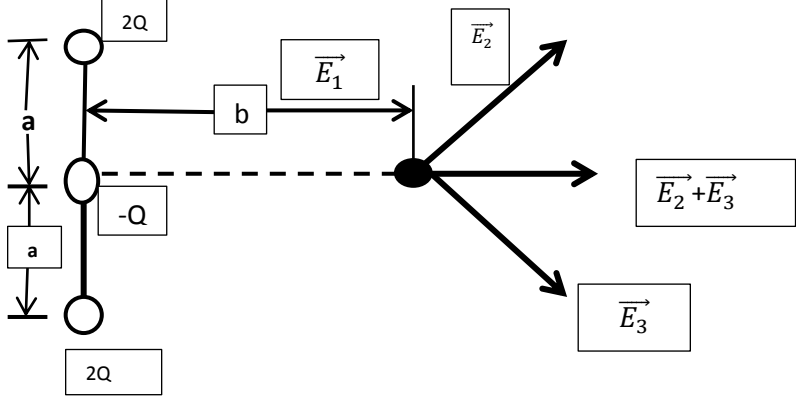
Course Details

Course Title: Electro Magnetic Field Theory Module: _____
 Instructor: _____ Total Marks: 30

Student Details

Name: _____ Student ID: _____

Q1: Solve the following short Question	(a)	Transform the vector $B = yi(x+z)j$ located at point (-2,6,3) into cylindrical coordinates	Marks 2 CLO 1
	(b)	Convert the point (3,4,5) from Cartesian to spherical coordinates	Marks 2 CLO 1
	(c)	Find the spherical coordinates of A(2,3,-1)	Marks 2 CLO 1
	(d)	Find the Cartesian coordinates of B(4.25,120)	Marks 2 CLO 1
	(e)	Find the force between two charges when they are brought in contact and separated by 4cm apart, charges are 2nC and -1nC, in μN .	Marks 2 CLO 2
	(f)	Find the electric field intensity of two Charges -2C and -1C separated by a distance 1m in air	Marks 2 CLO 2
	(g)	Determine the charge that produce an electric field strength of 40 v/cm at a distance of 30cm in vacuum (in 10^{-8}c)	Marks 2 CLO 2
	(h)	A charge of $2 * 10^{-7}\text{ C}$ is acted upon by a force of 0.1N. determine the distance to the other charge of $4.5 * 10^{-7}\text{C}$, both the charges are in vacuum	Marks 2 CLO 2
Q2:	(a)	<p>Find the angle between the vectors shown in figure.</p> 	Marks 4 CLO 1

	(b)	<p>Find the gradient of each of the following functions where a and b are constant</p> <p>(i) $f = ax^2 + by^3z$</p> <p>(ii) $f = ar^2 \sin \phi + brz \cos 2 \phi$</p>	<p>Marks 4</p> <p>CLO 1</p>
<p>Q3:</p>		<p>Three pointer charges are placed on the y-axis as shown. Find the electric field at point P on the x-axis.</p>  <p>The diagram shows a vertical y-axis with three point charges: a positive charge of $2Q$ at the top, a negative charge of $-Q$ in the middle, and a positive charge of $2Q$ at the bottom. The distance between the top and middle charges is a, and the distance between the middle and bottom charges is a. A point P is located on the x-axis to the right of the y-axis, at a horizontal distance b from the y-axis. A dashed horizontal line connects the middle charge to point P. At point P, three electric field vectors are shown: \vec{E}_1 is a horizontal vector pointing to the left; \vec{E}_2 is a vector pointing up and to the right; \vec{E}_3 is a vector pointing down and to the right. A resultant vector $\vec{E}_2 + \vec{E}_3$ is shown as a horizontal vector pointing to the right.</p>	<p>Marks 6</p> <p>CLO 2</p>