

CONTINUOUS INTERNAL EVALUATION- 1

Dept:EC	Sem / Div:V	Sub:Electromagnetic Waves	S Code:18EC55
Date:21/10/2020	Time: 9:30-11:00 am	Max Marks: 50	Elective:N

Note: Answer any 2 full questions, choosing one full question from each part.

Q N	Questions	Marks	RBT	COs
PART A				
1	a State and Explain Coulombs law and also represent in vector form.	9	L2	CO1
	b Two charges of magnitudes 2mC and -7mC are located at places P1(4,7,-5) and P2(-3,2,-9) respectively in free space, evaluate the vector force on charge at P2.	8	L3	CO1
	c A charge of $-0.3\mu\text{C}$ is located at A(25,-30,15) cm, and a second charge of $0.5\mu\text{C}$ at B(-10,8,12) cm. Find E at i) the origin ii) P(15,20,50)cm.	8	L3	CO1
OR				
2	a Derive the expression for electric field intensity due to infinite line charge.	9	L2	CO1
	b Two particles having charge of 2nC and 5nC are spaced 80 cm apart. Determine the electric field intensity at point 'A' situated at a distance of 0.5m from each of the two particles. Assume dielectric constant of 5.	8	L3	CO1
	c Define a) Electric field intensity b) Volume charge density c) Electric flux density.	8	L2	CO1
PART B				
3	a Derive the relation $\mathbf{E} = -\nabla V$. Write potential gradient in all the coordinate systems.	8	L2	CO2
	b Evaluate both sides of Divergence theorem for the field $\mathbf{D}=2xy \mathbf{a}_x + x^2 \mathbf{a}_y \text{ C/m}^2$ and the rectangular parallelepiped formed by the planes $x=0$ and 1, $y=0$ and 2, and $z=0$ and 3.	10	L3	CO2
	c State and prove Gauss's law.	7	L2	CO1
OR				
4	a Define potential difference and absolute potential. Derive the expression for potential difference due to point charge.	8	L2	CO2
	b A point charge of 6 nC is located at origin in free space. find potential of point P. if P is located at(0.2,-0.4,0.6) and i) $V=0$ at infinity ii) $V=0$ at(2,0,0) iii) $V=10 \text{ V}$ at (-0.8,2,-2)	10	L3	CO2
	c Derive the expression for equation of continuity in point form.	7	L2	CO2