

Programme Name & Branch : B Tech Electrical (EEE and EIE)
Course Code and Course Name : BEEE202L Electromagnetic Theory
Faculty Name(s) : Dr Rani C, Dr Indra Gandhi, Dr. Anusuya
Class Number(s) : VL2024250500925, VL2024250500985, VL202425050099
Date of Examination : 28/1/25
Exam Duration : 90 minutes
Maximum Marks: 50

General instruction(s):

- Answer All Questions
- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)
- Course Outcomes (Type the CO statements covered in this question paper. Use the CO number as per the syllabus copy)

Q. No	Question	M	CO	BL
1.	If $\vec{E} = \rho \sin \phi \hat{a}_\rho + \rho^2 z \cos \phi \hat{a}_\phi$ evaluate its value at point P (1, 30°, 3). Convert P and $\vec{E}$ to the cartesian coordinate system.	10	1	3
2.	Verify divergence theorem for the expression $\vec{D} = r^2 \sin^2 \phi \hat{a}_r$ in the region defined by $0 < r < 3$, $0 < \theta < \pi$, $0 < \phi < 2\pi$	10	1	3
3.	a) Find the gradient of the given scalar field at point (1, -1, 4)	5	1	3
	$V = \frac{yz^3}{x}$			
4.	b) Find the divergence of the given vector field at a point (2,2,4) $\vec{E} = 3y^3 \hat{a}_x + e^{x+3y} \hat{a}_y + 1000xz \hat{a}_z$	5	2	3
	a) A point charge of 6 μC is present at P1 (1, 3, -2), and another charge of 4 μC is present at origin. Find the electric field due to the charge combination at the point P (-3, 1, 1).	5		
5.	b) Find the voltage at (-3, 1, 1) for the above case.	5	2	3
	A circular ring of radius 4 m carries a uniform charge of 9 nC/m. find the electric field at a height of 3 m above the centre of the ring. What would be the total charge carried by the ring? If the ring was replaced by a sheet of charge of the same radius, with a charge density of 6 nC/m ² , compute the total charge on that sheet.	10		