Vellore Institute of Technology

ELECTRONICS ENGINEERING
CONTINUOUS ASSESSMENT TEST - 1
FALL SEMESTER 2025-2026

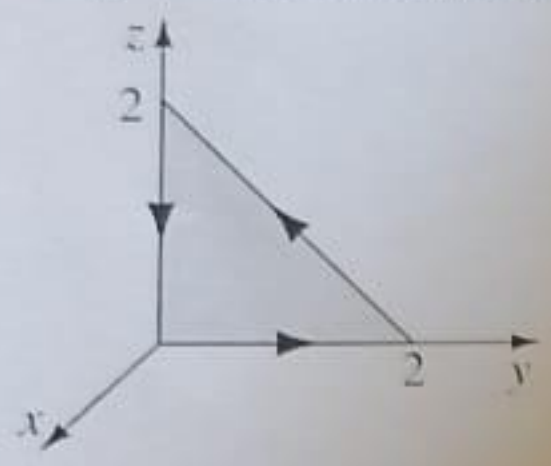
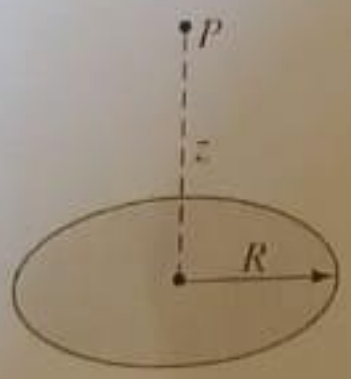
SLOT: B1+TB1

Programme Name & Branch	**: B. Tech. VLSI Design**
Course Code and Course Name	**: BEVD202L Electromagnetic Field Theory**
Faculty Name(s)	**: Dr. Rajan Kumar Pandey, Dr. Henridass A.**
Class Number(s)	**: VL2025260102594, VL2025260102596**
Date of Examination	**: August 18, 2025**
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)

Q. No	Question	M	CO	BL
1.	Calculate the divergence and curl of the following vector functions: (a) $\vec{v}_a = x^2\,\hat{x} + 3xz^2\,\hat{y} - 2xz\,\hat{z}$ (b) $\vec{v}_b = xy\,\hat{x} + 2yz\,\hat{y} + 3zx\,\hat{z}$	10	1	3
2.	Test Stokes' theorem for the function $\vec{v} = (xy)\hat{x} + (2yz)\hat{y} + (3zx)\hat{z}$, using the triangular shaded area shown in the figure below: 	10	1	3
3.	Find the electric field a distance z above the center of a flat circular disk of radius R that carries a uniform surface charge σ. What does your formula give in the limit R → ∞? Also check the case z >> R. 	10	2	3
4.	Suppose the electric field in some region is found to be $\vec{E} = kr^3\hat{r}$, in spherical coordinates (k is some constant). (a) Find the charge density ρ(r). (b) Find the total charge contained in a sphere of radius R, centered at the origin. Find your answer using Gauss's law and by direct integration.	10	2	3
5.	Find the potential a distance s from an infinitely long straight wire that has a uniform line charge density λ. Compute the gradient of your potential, and check that it yields the correct field.	10	2	3

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