



REGISTER NO:

Set B

DEPARTMENT OF ECE

Faculty of Engineering and Technology, SRM Institute of Science and

Technology

SRM Nagar, Kattankulathur – 603203, Kancheepuram District, Tamilnadu

Test: Cycle Test I

Course: 18ECCE105T

Electromagnetics and Transmission Lines

Class: Ilyr B.Tech

Slot: F

Date: 29-Jul-2019

Duration: 50 Mins

Max. Marks: 25

Batch: I

Program Learning Outcomes (PLO)														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Engineering Knowledge														
Problem Analysis														
Design & Development														
Analysis, Design, Research														
Modern Tool Usage														
Society & Culture														
Environment & Sustainability														
Ethics														
Individual & Team Work														
Communication														
Project Mgt & Finance														
Life Long Learning														
PSO-1: Professional Achievement														
PSO-2: Project Management Techniques														
PSO-3: Analyze & Research														

Part-A (5 x 1 = 5 Marks)

(Answer all)

1. The relationship between electric field intensity E and potential V is given by _____

2. A vector \vec{A} is said to be irrotational, if its _____ is zero.

3. The electric flux density D is _____ to the electric flux lines.

4. The point P ($x = 0, y = -4, z = 3$) will be represented as _____ in Cylindrical coordinate system.

5. Find the electric field at point P ($r = 2, \theta = 25^\circ, \phi = 90^\circ$) if $\vec{D} = 0.3r^2 \vec{a}_r$ in free space.

Part-B (2 x 4 = 8 Marks)

(Answer any 2)

6. Write the formulae for Differential length, Surface and Volume element in a Spherical Coordinate System

7. Find the divergence of

$$\vec{X} = \rho \sin \phi \vec{a}_\rho + \rho^2 z \vec{a}_\phi + z \cos \phi \vec{a}_z$$

8. Express the Electrostatic energy in terms of Electric field intensity and Electric flux density.

Part-C (1 x 12 = 12 Marks)

9. The finite sheet $0 \leq x \leq 1, 0 \leq y \leq 1$ on the $z=0$ plane has a charge density $\rho_s = xy(x^2 + y^2 + 25)^{3/2} \text{ nC/m}^2$. Find (i) total charge on the sheet (ii) Electric field at $(0,0,5)$ (iii) The force experienced by a -1 mC charge located at $(0,0,5)$.

(OR)

10(i) Derive an expression for Electric field intensity due to a charged circular ring. (5marks)
 (ii) Define Gauss law and Derive an expression for the electric flux density due to a infinite sheet of charge. (7marks)



Set A

[illegible]

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Course: 18ECC105T

Class: Ilyr B.Tech

Date: 29-Jul-2019

Duration: 50 Mins
Max. Marks: 25

Slot:F

Batch:1

Engineering	M	H
Problem Analysis	M	H
Design & Develop		
Analysis, Design,		
Modern Tool		
Society & Culture		
Environment &		
Ethics		
Individual & Team		
Communication		
Project Mgt &		
Life Long Learning		
PSO-1: Professionalism		
PSO-2 Project		
PSO-3 Analyze	L	

Part-A (5 x 1 = 5 Marks)
(Answer all)

(Answer all)

1. The relationship between electric flux density D and electric field intensity E is given by _____
2. Stoke's theorem relates _____ to _____
3. A vector \vec{A} is said to be solenoidal, if its _____ is zero.
4. The point T ($x=1, y=3, z=5$) will be represented as _____ in spherical coordinate system.
5. Find the electric field intensity at $P(4, 6, -5)$ in free space caused by a charge of 0.1mC at $(2, -1, -3)$.

Part-B (2 x 4 = 8 Marks)
(Answer any 2)

(Answer any 2)

6. Write the formulae for Differential length, Surface and Volume element in a Cylindrical coordinate system
7. Find the gradient of $V = e^{-z} \sin 2x \cos y$
8. Derive an expression to obtain the Energy density in the Electrostatic field.

Part-C (1 x 12 = 12 Marks)

9. Evaluate both sides of the Divergence theorem for the field $\vec{D} = 2xy^2\hat{x} + x^2\hat{y}$ C/m² and the rectangular parallel piped formed by the planes $x = 0$ and $x = 1$, $y = 0$ and $y = 2$, $z = 0$ and $z = 3$.
- (OR)
10. Define Electric Dipole and derive an expression for the Electric field at a point P in spherical coordinate system due to the electric dipole