

PART - A

ANSWER ALL QUESTION EACH CARRY 5-MARKS

1. Explain orthogonality and orthonormality of unit vector (5M) in Cartesian co-ordinate system?
2. Explain Coulombs law and write the equation of force for on one charge by other? (5M)
3. Explain Bio-Savart law with Magnetic field strength equation also draw a diagram? (5M)
4. Define polarization and write the polarization equation (5M)
5. Write down equation of pointing Vector? (5M)
6. Explain power flow in coaxial cable? (5M)
7. Write down the equation of Wave (Plane Wave)? (5M)
8. What is phase & group Velocity? (5M)

- ① a) Define the Electromagnetics ? (3M)  
 b) Explain Stokes & Divergence theorem with equations ? (7M)

② a)  $\vec{F} = x^2y\hat{i} - (z^3 - 3x)\hat{j} + 4y^2\hat{k}$  (6M)  
 find curl & divergence of  $\vec{F}$

b) Write down the formulae of curl of  $\vec{A}$  in cylindrical system in determinant way ?

$\nabla \times \vec{A} = \underline{\hspace{2cm}} ?$  (4M)

③ a) Explain Gauss law with equations ? (8M)

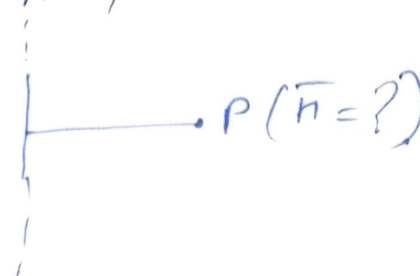
b)

$\epsilon_1$	$\epsilon_2$	$\epsilon_3$
$A_1$	$A_2$	$A_3$

$\downarrow d$  (write equivalent capacitance formulae)  $C_{eq} = ?$  (2M)

PART-C (Answer any 2 out of 3)

- ① a) Define Ampere Circuital law ? (3M)  
 b) Write the equation of  $\vec{H}$  due to line conductor with diagram & also write the equation of  $\vec{H}$  for  $\infty$  length of conductor at a point ? (7M)



② What is Electrostatic Energy and also

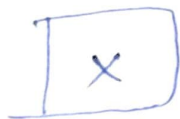
a) Write the equation of energy stored by Capacitor? (6M)

b) Define continuity equation and write the formulae for it? (4M)

③ Define Right hand thumb rule Fleming Right hand rule & Fleming left hand rule? (6M)

b) Write equation of Lenz's law

Find the direction of Induced Current as per Lenz's law?

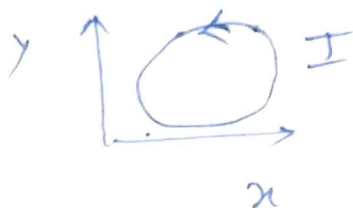


field is into the paper and field is increasing. Find the direction of Induced Current as per Lenz's law? (4M)

PART 4 (Answer Any 2 out of 3).

1) A circular loop placed in an  $xy$ -plane. Due to

a) thermal expansion, a  $I$  is induced in the ACW direction when a uniform magnetic field is applied. The direction of  $\vec{B}$  is —?



$\vec{B} = ?$

(5M)?

5) write equation of <sup>Conduction</sup> Current and Displacement Current density ? (5M) (Page-4)

(Q2) a) What is uniform plane wave explain with diagram as well write the equation of Characteristic impedance / intrinsic impedance ( $\eta$ ) ? (7M)

b) write the equation of wave in phaser form? (3M)

Q3 (a) for a wave propagation in different Scenario :-

	$\sigma$	$\epsilon$	$\mu$
Lossy	✓		
Lossless			
Free space			
good conductor			

(6M)

write value of  $\sigma, \epsilon, \mu$  in different types ?

b) explain skin depth with diagram and write value of skin depth (formulae) ? (4M)

ALL THE BEST

x ——— x ——— x