	Topic
	1 0 1 1 in the convent of
us I	State Ampere's law & Explain the concept of displacement current.
	displacement current.
dru:-	The state of the s
	Amperer's clrewital law states that cline integral of steady maynetic field over a closed cloop is equal to the times the
	of steady maynetic field over a closed
	cloop is egilal to lo times the
	thetal coverent (I) paying through the
	total current (I) paining through the surface bounded by the loop i.e.
	upward wount werent
	Toward werent
	10
	1 1 1 2
	Amperian loop
	dl 178
	のB.dl = MoTe
	g B.a. More
	Ie = Enclosed auvent.
	4
	The relation alraw invalues a sign convention
	The relation above involves a sign convention, given by right hand rule. Let the
HREE NAVNEET	

Need for Dieplacement converent
i all law law conduction of current
during alleger modified
Ampereit ircuital law by introduing the
concept of diplacement current
Displacement convent
Diplacement curred is the covered that is
Displacement current is the conge of the produced by the rate of change of the electric displacement field. It disposes from the normal current that is produced that is produced that is produced.
from the normal current that is produced to the elicibic change.
Suddiement writer it is morned in
in Maxwell's equite and produced by
a time varying
Defination. A physical quantity rulated to Maxwell's equation A physical quantity rulated to Maxwell's equation that has the property of the electric accuracy is that has the property of the electric accuracy.
1 1 Vall III III III
event is defined as the veate of change of the electric diplacement (D).
d in Capaulor
A changing capacitor changes
REE NAVNEET Signature:

То	pic Date: P. No:
9	linger of the right hand be could in the
	sense the boundary is traversed in the
	loop integral & B. II. Then the direction of the thumb gives the send in suchich the current I is regarded
	which the wwent I is regarded
	as positive In the diagram shown is is taken positive and is is
	negative.
	It should be similar to the game's law
	loop but it may not always fatherale
	in every care of it heat suited
	in Quhich integral on the left
	loop but it may not always facilitate an evaluation of the magnetic field in every case It is but suited in bushich integral on the left side of the egn is solved early veings the symmetry of the sincetion.
	1. amenal applications At it marifule to
	choose the loop scalled an Amperian
	for several application, It is parille to choose the loop (called an Amperian loop) seuch that at each point on the loops, either
(1)	B is tangential do the loop and has a mon zero constant magnitude B, or
	mon your constant magnitude B, an
(iii)	B is normal to the deep or
(iii)	B vanishes everywhere on the loop.
_ Curr	
SHREE NAVNEET	Signature :

	Topic
	the electric field link with the capacitor that in lower produces the covered called the displacement convert.
	called the displacement current.
	called the displaining about.
-	$I_{p} = J_{p} S = S \frac{dD}{dt}$
-	at dt
-	
	where
_	
	S = area of the capacitor plate
	I = Dinterement wewent
	5 = area of the capacitor plate I = Displacement convert D = Elichic field E.
	D = Glichic Lield E
	1
	D= SE
	La de la destacación dela destacación de la destacación dela dela dela dela dela dela dela dela
	E = Permittivity of material between plates.
	pisplacement Current equations
	Maxwell's egn defines the displacement autic
	has the some unit as the electric coursers, the
	has the some unit as the electric convent, the Maxwell yield egn is supresented as
	T. T.
	# TXH = J+Jp
	H= magnetic field B as B= MH
	- 1:15th of material him the plater
	T = Conducting award density
	+ = displantant covered density.
-	Is a displacement awarend density.
	Signature:

une know that
$\nabla \cdot (\nabla x H) = 0$
$\sqrt{v.t} = -d\theta$
d
$\overline{V} \cdot J = -\overline{V} \cdot \frac{dD}{dt}$
uning gamis Law V.D = P
U V V.D = P
a de la
P= electric charge density
Thus electric displacement convert density egn is
Thus eliches duplacement across
$J_{D} = dD$
1 1 1 1 lesement wevent
Characterities of displacement auruent
In an electric circuit there are two lypes of
covered that are consulton covered and the
other is diplacement current. Various characteristics
other is duplacement current own mentioned below.
of dispersion to the select
-> Displacement current does not appears from the actual
movement of the electric charge as so in the carl
of the conduction current but is produced by time changing electric field.
changing electric field.
-> Dupluement cureuent is a nector quantity.
-> Electromagnette want propagate with the
-> Duphuement cureuent is a with the & help -> Electromagnetic waves propagate with the & help of displacement current.
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us 2	and I am amount of equations.
Ins:	Maxwell first equation. Maxwell's first equation is leaved on the yours law of electrostatic which states that "when a cloud surface integral of electric flux denity is always equal to charge enclased over. that surface."
	Maxwell's field Equation is heard on the gain
	a cloud surface integral of electric flux denity
	Is always equal to charge enclared out
	that surface.
	Mathematically game law can be expressed as, \$\overline{D} \cdot \overline{C} = Qendosed - 0
	Do as - Gendosea
	dry closed system will have multiple surfaces but
	integral can be converted into a volume integral
	a single volume, they, the about surface integral can be converted into a volume integral ly taking the divergence of the same vectors, thus mathematically ist is
	$ \oint \vec{B} \cdot d\vec{S} = \int \nabla \cdot \vec{B} d\vec{V} - \vec{Z} $
	combining eq 0 and 0 we get
	$\int \nabla \cdot \vec{D} d\vec{v} = 0$ endosed -6
	rolume change density can be defined as-
	$PV = dQ$ \overline{dV}
	$dQ = \rho v dv$
	on integrating alove egn ne get
SHREE NAV	NEET $Q = \int \rho v dv$ Signature:

	Topic	and the second s
	R	electituding (4) in (3) we get
		0
		V. Ddv = Spvdv
		V. Ddv = pv
		this is required yet maxwell equation.
	-	this is required In missiles.
		Maxwell Second Equation
	1	1 armell second equation is there
		on magnetostatics.
	1	Janua law on magnetastatics states that Janua law on magnetastatics states that "closed surface integral of magnetic flux density is always equal to total scalar magnetic flux enclosed within that surface of any shape flux enclosed within that surface of any shape or size lying in any medium."
	0	a closed surface entegral to total scalar magnetic
		denity is always equal similar of any shape
		flux l'enclosed multiple any medilm,"
_		on size lying
		\$ B.ds = pendosed -0
_		g sie forest lie
	-	Mence we can conclude that magnetic flux cannot be.
_		Mence use can conclude and magne of any shape.
-		$\oint \vec{B} \cdot ds = 0 -Q$
-		i de de com de con (2)
-		Applying the gaun divergence theorem interval ly
		wee can convert it will vale with.
		taking the divergence of the sain with
		9 B. ds = JV. Bav
		1.1. line out a in @ we get -
		Suluthung eg (3) xi. Signature:
		Applying the gaun divergence theorem to ean 2 use can convert it into volume integral by taking the divergence of the same vector. \$\int\text{B}.ds = \sqrt{V}.\text{B}dv - 3 Substituting eqn 3 in @ we get - Signature:

Тор	ic Date: P. No:
	5√. Bdv = 0 — 1
	Hove to satisfy the above egn either
	$ \int dV = 0 $ $ \nabla \cdot \vec{B} = 0 $
DY	V.B=0
4	The volume of any body are object can never be zero. Thus we arrive at maxwell's swand equation.
	They we arrive at maxwell's swand equation.
	V.B = 0
-	
-	John B = uH is flux density
	II N' I lation
-	Maxwell third Equation
-	Maxwell's 3rd egn is devived from faraday's laws of Electromagnetic induction, it states that
+	in a closed path placed in a time-rawing
-	in a closed path placed in a time - reverging
	magnétic field, an altounating electromotive
	Love gets enduced in each coil."
	Leng's law gives this withich states, "An
	induced electromolive force always opposes
	the time - ranging magnetic flux.
	11 11 11 to it is expressed as -
	Mathematically & it is expressed as-
	strong en,
	$emf_{att} = -N d\phi $
	O 1 Signature:
VNEET	N= no of twens in a coil. Signature:

NA.

Date: P. No:9
φ = scalar magnetic flux
Let N= 1
$emf_{att} = -\frac{d\phi}{dt} - 2$
here scalar magnetic flux can be explaced by-
hou scara
$\phi = \int \vec{B} \cdot d\vec{s} - 3$
φ= ∫B.ds — B Sulufitude egn B in D
$emf_{all} = -\frac{d}{dt} \int \vec{B} \cdot d\vec{s}$
which is passial D.E. given by-
menici wi
$e^{mt} at = \int -\frac{dB}{dt} \cdot d\vec{s} - \vec{\Phi}$
as de motive sorce induced in a coil is
The alternating elutromotive force induced in a coil is leavically a closed path.
leasteally va descent part
$enf_{all} = \oint \vec{E} \cdot d\vec{l} - \oint \vec{E} \cdot d\vec{l}$
all desired of the second
Sulutuling egn & ån A eve get -
$\oint \vec{F} d\vec{V} = \int -3\vec{B} \cdot ds - \vec{G}$
g Edl = J(√xĒ)·ds — () (uing stoke's theorem)
Ø Edl = ∫(∇xĒ)·ds —(7) (using otoke's theorem)
Substituting egn (7) in (6) we get
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		• 2
	Topic	
		$\int (\nabla \times \vec{E}) d\vec{s} = \int -\frac{3\vec{B}}{3t} \cdot d\vec{s} - 8$
		J(\(\neq \times \) \(\delta \times \times \) \(\delta \times \times \delta \delta \times \delta
	1	e surface integral can be canceled on both sides and we get
	Th	e surface integral can us
		and we get
		VXE = - 3B
		OXE = 20
	-	3.5
	1	in is sugaired 3rd maxwells equation.
	1/1	ny les sergies e
_		laxwell, 5 fourth Equation.
_	1	daxwer's fourth equation is derived from
-		Naxwell's fourth equation is derived from uaxwell's fourth equation is derived from Ampene's law which states that Ampene's law which states that
-		u Magnetic field can be either produced by electric
-	-	current our les the alleving electric field "
	-	Control of the state of the sta
-		the magnetic field vector's closed with present field equal to the total quantity of scalar cleans field
		account in the pain of war en
-		Maxwell's eg. and diff
		1 +1
		sugnational to the waited magnets
		aliquing and allere water
		I I I I Amneye's law.
		Maxwell added the displacement account so informath
_		Mathematical supresentation of maximes, equation
		Maxwell added the displacement evenent to Ampere's law. Mathematical supreenlation of maxwell's equation fawith Equation.
		Closed line integral of magnetic field vector = Jobal quantity of scalar electric yield present, signature:
		of scalar electric
REF	NAVNEET	yield puwrd, Signature:
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	

SHE

	Date:P. No:
То	pic
_	φH.d=1 -0
	φ μ.ω - 1 = 0
	$d\vec{H} \cdot d\vec{U} = \int (\nabla \times \vec{H}) \cdot dx - Q$
	(by stoke's theorem)
	using @ in eg 0
	$\int (\nabla \times \vec{R}) \cdot \vec{dl} = I \qquad -3$
	J(VXI). Il = Vedor quantity. I = Scalar quartity. Hulliply I by density vedor,
	I = Scalar quartity.
	Mulliply I dry density vedox,
	J = I QN have probe location that
	= Difference in scalar electric field/oifference in vector electric field =.
-	vertor electric field 3.
	all I a la l
	ds.dl = J. ds
	comment to up to approve the supplement
	I= (7.0) - (4) mount and building
	much range a dand making is making
	Ming eq & in eq 3.
	1/2 × 17 1 7 - (7 17 - (5)
	$\int (\nabla \times \vec{H}) \cdot \vec{dt} = (\vec{x} \cdot \vec{dt}) - \vec{dt}$
	Cancelling the surface integral from both sides,
	we ad maxwell's fourth equation
	the go makine s factor equation
	J= VXH
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E

Own 3 ostate and persue paynting theorem. Statement: This theorem states that the cross predict of electric field vector, E and magnific field vector, E and magnific energy per unit area at that point, that is P = EXH P = Poynting relating that point, that is P = EXH P = Poynting relating fauth eght had is del XH = I + E dE at Or I = (del XH) - EE. dE — (1) At (taking dot product with) where warners or E. (del XH) = H. (del XE) - E. (del XH) Screene:		
Own? State and prease poynting theorem. Statement:— This Theorem states that the wass preaded of elicitic field verlox, E and magnific verlot verlox, H at any point is a measure of the wast of flow orf electromagnetic energy per unit was at that point, that is P = EXH P = Royrhing verlox, PIE and H Proof: Touisdur maxwell's fauch egn that is del XH = I + E dE at or I = (del XH) - EE. dE — D At (Faking det product with) we wedow identify del.(EXH) = H.(del XE) - E.(del XH) or E.(del XH) = H.(del XE) - del (EXH)		
Own? State and prease poynting theorem. Statement:— This Theorem states that the wass preaded of elicitic field verlox, E and magnific verlot verlox, H at any point is a measure of the wast of flow orf electromagnetic energy per unit was at that point, that is P = EXH P = Royrhing verlox, PIE and H Proof: Touisdur maxwell's fauch egn that is del XH = I + E dE at or I = (del XH) - EE. dE — D At (Faking det product with) we wedow identify del.(EXH) = H.(del XE) - E.(del XH) or E.(del XH) = H.(del XE) - del (EXH)		P.No. 12
Owr 3 State and presue poynting, theorem. Statement:— This Theorem states that the cross presdud of electric field verbor, E and magnetic field verbor, H at any point is a measure of the wate of flaw as aller point, that is P = EXH P = Poynting webor, PIE and H Proof: Consider maxwell's fauth egn that is del XH = I + E dE at Or I = (del XH) - EE. dE — (1) At (Faking dot product with) we verbor identify del.(EXH) = H.(del XE) - E.(del XH) Or E.(del XH) - H.(del XE) - del (EXH)		500
Owr 3 State and presue poynting, theorem. Statement:— This Theorem states that the cross presdud of electric field verbor, E and magnetic field verbor, H at any point is a measure of the wate of flaw as aller point, that is P = EXH P = Poynting webor, PIE and H Proof: Consider maxwell's fauth egn that is del XH = I + E dE at Or I = (del XH) - EE. dE — (1) At (Faking dot product with) we verbor identify del.(EXH) = H.(del XE) - E.(del XH) Or E.(del XH) - H.(del XE) - del (EXH)		
Statement:— This Theorem states that the cuess persolut of electric field vertor, E and magnetic field vertor, H at any point is a measure of the reate of flow any point is a measure of the reate of flow and point, that is P = EXH P = Poynting vertor, PIE and H Proof: Consider maxwell's fourth egn that is del XH = J + E dE at or J = (del XH) - EE. dE — (1) At (Faking dot product with) we vertor steinthy del. (EXH) = H. (del XE) - E. (del XH) or E. (del XH) - H. (del XE) - del (EXH)		$(\triangle XH) = 1 + 1$
Statement:— This Theorem states that the cuess persolut of electric field vertor, E and magnetic field vertor, H at any point is a measure of the reate of flow any point is a measure of the reate of flow and point, that is P = EXH P = Poynting vertor, PIE and H Proof: Consider maxwell's fourth egn that is del XH = J + E dE at or J = (del XH) - EE. dE — (1) At (Faking dot product with) we vertor steinthy del. (EXH) = H. (del XE) - E. (del XH) or E. (del XH) - H. (del XE) - del (EXH)		
Statement:— This Theorem states that the cuess persolut of electric field vertor, E and magnetic field vertor, H at any point is a measure of the reate of flow any point is a measure of the reate of flow and point, that is P = EXH P = Poynting vertor, PIE and H Proof: Consider maxwell's fourth egn that is del XH = J + E dE at or J = (del XH) - EE. dE — (1) At (Faking dot product with) we vertor steinthy del. (EXH) = H. (del XE) - E. (del XH) or E. (del XH) - H. (del XE) - del (EXH)	00	at I describe sounting, theaven.
Statement:— This Theorem states that the cuess persolut of electric field vertor, E and magnetic field vertor, H at any point is a measure of the reate of flow any point is a measure of the reate of flow and point, that is P = EXH P = Poynting vertor, PIE and H Proof: Consider maxwell's fourth egn that is del XH = J + E dE at or J = (del XH) - EE. dE — (1) At (Faking dot product with) we vertor steinthy del. (EXH) = H. (del XE) - E. (del XH) or E. (del XH) - H. (del XE) - del (EXH)		State and priorite pagetting
P = EXH P = Poynting vector, PIE and H Proof: Consider maxwell's fourth egh that is del XH = I + E dE dt or I = (del XH) - EE. dE — (1) At (Fating dof product with) we vector identify del.(EXH) = H.(del XE) - E.(del XH) or E.(del XH) - H.(del XE) - del(EXH)	ani-	statement: This theorem states that the cross
P = EXH P = Poynting vector, PIE and H Proof: Consider maxwell's fourth egh that is del XH = I + E dE dt or I = (del XH) - EE. dE — (1) At (Fating dof product with) we vector identify del.(EXH) = H.(del XE) - E.(del XH) or E.(del XH) - H.(del XE) - del(EXH)		neighbor of electric field vector, E and magnetic
P = EXH P = Poynting vector, PIE and H Proof: Consider maxwell's fourth egh that is del XH = I + E dE dt or I = (del XH) - EE. dE — (1) At (Fating dof product with) we vector identify del.(EXH) = H.(del XE) - E.(del XH) or E.(del XH) - H.(del XE) - del(EXH)		field vector, it at any point is a measure of
P = EXH P = Poynting vector, PIE and H Proof: Consider maxwell's fourth egh that is del XH = I + E dE dt or I = (del XH) - EE. dE — (1) At (Fating dof product with) we vector identify del.(EXH) = H.(del XE) - E.(del XH) or E.(del XH) - H.(del XE) - del(EXH)		the easte of flow of electromagnetic energy
P = EXH P = Poynting vector, PIE and H Proof: Consider maxwell's fourth egh that is del XH = I + E dE dt or I = (del XH) - EE. dE — (1) At (Fating dof product with) we vector identify del.(EXH) = H.(del XE) - E.(del XH) or E.(del XH) - H.(del XE) - del(EXH)		per unit and at that point, that is
Proof: Proof: Consider maxwell's fourth egn that is del xH = J + & dE dt or J = (del xH) - & dE dt E.J = E. (del xH) - & E. dE — () (Faking dot product with) Luc vector stainty del. (ExH) = H. (del xE) - E. (del xH)		0 2 2 3 1 1
Proof: Consider maxwell's fourth egn that is del XH = I + E dE at or I = (del XH) - EE. dE - () dt (taking dot product with) we nector identity del. (EXH) = H. (del XE) - E. (del XH) or E. (del XH) - H. (del XE) - del (EXH)		P = EXH
Proof: Consider maxwell's fourth egn that is del XH = I + E dE at or I = (del XH) - EE. dE - () dt (taking dot product with) we nector identity del. (EXH) = H. (del XE) - E. (del XH) or E. (del XH) - H. (del XE) - del (EXH)		P = Poyrary (acros) 122 ard
$del \times H = J + \varepsilon dE$ dt $ov J = (del \times H) - \varepsilon dE$ $\varepsilon \cdot J = E \cdot (del \times H) - \varepsilon E \cdot dE - 0$ dt $(del \times H) = H \cdot (del \times E) - E \cdot (del \times H)$ $ov E \cdot (del \times H) = H \cdot (del \times E) - del (E \times H)$		
$del \times H = J + \varepsilon dE$ dt $ov J = (del \times H) - \varepsilon dE$ $\varepsilon \cdot J = E \cdot (del \times H) - \varepsilon E \cdot dE - 0$ dt $(del \times H) = H \cdot (del \times E) - E \cdot (del \times H)$ $ov E \cdot (del \times H) = H \cdot (del \times E) - del (E \times H)$		Consider maxwell's fourth egh that is
or $J = (del \times H) - \xi dE$ $E \cdot J = E \cdot (del \times H) - \xi E \cdot dE - 0$ dt $(**baking dot product with)$ $uu verdor identity$ $del \cdot (E \times H) = H \cdot (del \times E) - E \cdot (del \times H)$ $or E \cdot (del \times H) - H \cdot (del \times E) - del (E \times H)$		
$E \cdot J = E \cdot (\text{del } \times H) - E \cdot dE - 0$ $\text{If } del \text{ (if } del \text{ in } g \text{ dot } product \text{ with})$ $\text{del } \cdot (E \times H) = H \cdot (\text{del } \times E) - E \cdot (\text{del } \times H)$ $\text{or } E \cdot (\text{del } \times H) = H \cdot (\text{del } \times E) - \text{del } (E \times H)$		$\frac{\det xH = J + \epsilon \frac{d\epsilon}{dt}}{dt}$
$E \cdot J = E \cdot (\text{del } \times H) - E \cdot dE - 0$ $\text{If } del \text{ (if } del \text{ in } g \text{ dot } product \text{ with})$ $\text{del } \cdot (E \times H) = H \cdot (\text{del } \times E) - E \cdot (\text{del } \times H)$ $\text{or } E \cdot (\text{del } \times H) = H \cdot (\text{del } \times E) - \text{del } (E \times H)$		
del. (EXH) = H. (del XE) - E. (del XH) or E. (del XH) = H. (del XE) - del (EXH)		or J = (du xn) - Ede
del. (EXH) = H. (del XE) - E. (del XH) or E. (del XH) = H. (del XE) - del (EXH)		Pearly was all the second of t
del. (EXH) = H. (del XE) - E. (del XH) or E. (del XH) = H. (del XE) - del (EXH)		E.J = E. (del XH) - EE. dE _ ()
del. (EXH) = H. (del XE) - E. (del XH) or E. (del XH) = H. (del XE) - del (EXH)		(Inking dat product with)
or E. (del XH) = H. (del XE) - E. (dul XH) or E. (del XH) = H. (del XE) - del (EXH)		- Les Maria
or E. (del XH) = H. (del XE) - del (EXH)		the ready daily
or E. (del XH) = H. (del XE) - del (EXH)		del. (EXH) = H. (del XE) - E. (del XH)
		or E. (del XH) = H. (del XE) - del (EXH)
	SHREE NAVNEE	

By substituting value of E. (del XH) in eg 1 we get
E,J = H. (del XE) - del . (EXH) - & E dE -2)
also from Maxwell's Mird egn (traday's law of electromagnition).
del XE = udH
Ly substituting value of del XE in egn @ ever get E.J = MH. (dH) _ &E. dE _ del .(EXH) _ 3 dt dt
E.J = MH. (dH) _ EE. dE _del.(EXH) _3
we can weite
$H \cdot dH = \frac{1}{2} \frac{dH^2}{dt} - F_0$
$\frac{E \cdot dE}{dt} = \frac{1}{2} \frac{dE^2}{dt} - 4D$
By substituting egn na and 4b in egn 3 we get.
$E.J. = -y dH^2 - \varepsilon dE^2 - del.(EXH)$
$E.J = -d_1\left(\frac{dH^2}{2} + \frac{\xi E^2}{2}\right) - del.(EXH)$
By taking valume integral on list side we get.
Cignoture 1

Topic
(ET IV = -d (12 -2) 1. (dol.(EXH)dV - (5)
$\int [E.J.dV = -\frac{d}{dt} \int (uH^2 + E^2) dv - \int del \cdot (E \times H) dV - [S]$
 11
apply gauss's divergence theorem to second team of RMS. to change volume integral into "sweface integral, Med is
of RMS. to change volume integral unto
surface integral, Med is
Sdel. (EXH) dv = S(EXH).ds
n i een
Sulutitute above egn in egn 5
Thus the state of
JE.J. dr = -d [[= E2 + uH2] dv - ((EXH).ds -6)
 dt) [2/2 + 2]
or .
(EXH). ds = (- of [EE2/2 + MH/2] dv - (E.J. dv
(6) 1- (d. [a. [2]) 1 142] dy - (E. J. dy)
(ExH) ds = [- of [2E2] + wH2] dv -) E.J. dv
Hence proved
to birdley your my and his a print
F TO THE WAR THE STATE OF THE S