	Page: Date: / /
*	Micropave freq band range: I CTHZ to 1988 CTHZ
	L 0- 1 to 2 CπHz
	С 6- 4 to 8 СПНZ
L. Man	X 10 8 OTHZ
	KAD 6- 12 to 18 GTHZ
	L O
	K = 18 to 27 στΗΣ kA = 27 to 40 στΗΣ
	ET TO TO DIRZ
3.0 ★	TSM: Jndustaial Scientific Medical band
	Bluetooth = 2.4 GTHZ
measi	9 4 4 5 2 0 0 1 4 5 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
	AM = 0.45 MHZ to 1.60 MHZ
	FM = &8 HHZ to 108 HHZ
	A DESCRIPTION AND A CORT OF THE PARTY OF THE
Q. *	Explain Advantage of similar on over
1.	extremelly high Bar due to free norman is
	7 CπHZ to 1008 CπHZ
2	Directivity in the microwave freque due to high trees
	it is rused porton Satellite on commission
_	Beam width < 1°
	8=500140 mass and and diameter 10F reflector
	Lyman situation of anternal Mar !
	$\beta \neq 1$, $f = 1 C\pi HZ$
	$\gamma = C = 3 \times 10^8$
	F 109 ราณี และเร็กตรแบบรับ 4 75
	= 0,3m speciestrost like 0. j
	and rescend through some see for
	and a substantial and a substa

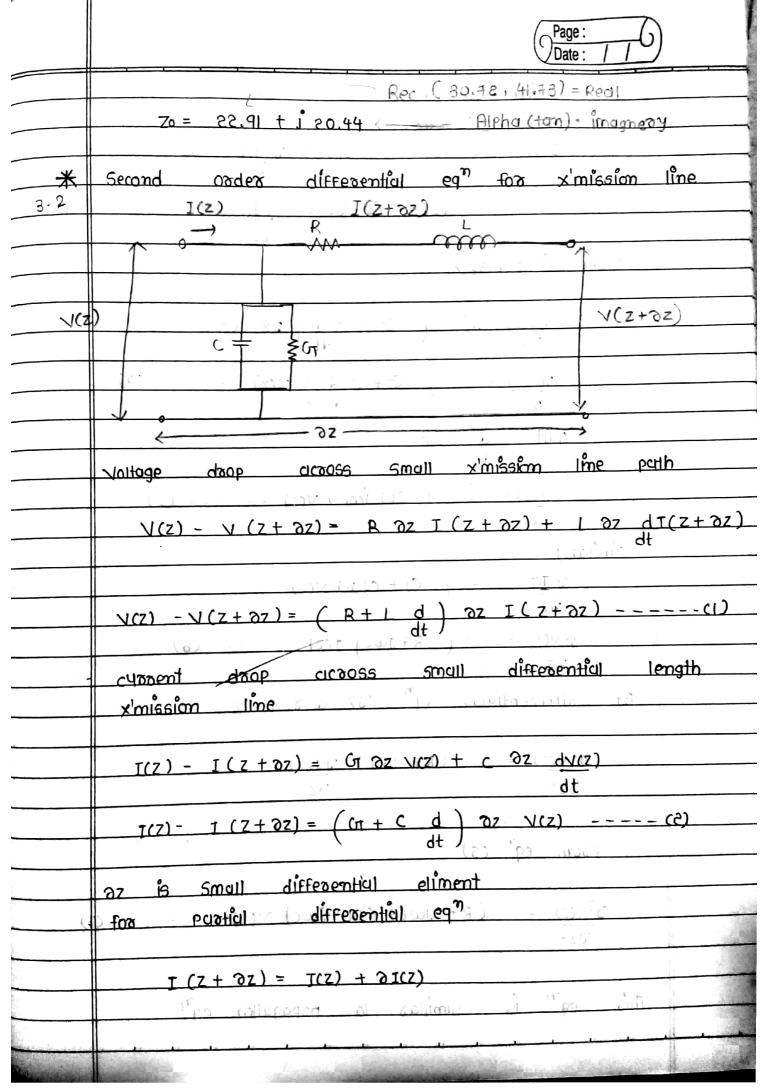
	Date:
_	D = 1400 = 1400 = 42 m
_	$D = \frac{1400}{\beta}$
_	$B = 1^{\circ}$, $f = 10$ CTHZ
_	$\beta = 1 + 1 = 10 \text{ sm}$ $\beta = 0.03 \text{ m}$
_	D = 1402 = 4.2 m
	β
3	Transpeading property: signal is extermelly transpersed
_	50 it is benifit for space commn
4_	less feeding :- Because OF line OF sight comm
	rounsmitted pomen is inversly peoposition of square
	of freq ⁿ Power toansmission requirement less in succeive comm ¹
_	Printed ladisimisatory organization is a second of the second of the second organization of the second organization of the second organization or the second organization
<u> </u>	explain application of micropave.
<u> </u>	military application (ex = Radar)
<i>₹\</i> ~ ⟨?	Telecommunication (cellular system, Otsm)
3> ~>	commencial application (bluelooth, Zig-bee @ @1-fi)
<u>-</u> 4> ~	microcouve owen (food processing)
<u>-</u> \$> *	In FMI [electro magnetic interference] 19
	FMC [electro magnetic compactibility]
6/2.*	TEMODE [Toursveace electric mode]
_	TEM Moor [Tamsveace electro mugmetic mode]
_ Q *	defined TEMODE lo THHODE lo TEMMODE
	Tounsmission line
	(0 - cixial Tounsmission line
-	Two - wise posule x'mission line
_	microstaip xmission ime
	Coonned by ComCoonner

	Page: Date: / /
\rightarrow	(0- c)xเ๊น Tซนารกเรือเ๊ดา เก็ย
	immes conductos
	outer conductor
	> magnetic field
	Here current is going inside the page
1. 12.	45711
→	Two - wire parallel Transmission line
	D = Spacing between two wine
	R
1	fine fine
The Late	Sign Sign of ad
	$70 = \sqrt{R + \text{scul}}$
7151.5.4 2.1.5 1515364	$\frac{70 = \frac{R + \text{icul}}{C\tau + \text{icoc}}$
	$\frac{70 = \frac{R + \text{jcul}}{\text{cr} + \text{jcoc}}$
	$\frac{70}{\text{CT} + \text{j} \text{coc}}$ $\frac{70}{\text{CT} + \text{j} \text{coc}}$
	70 = R+scul C7+ jcoc C= II€ → electoic field > magnetic field
71.3.3.3 11.3.3.6(L)	$70 = \frac{R + j cul}{c_T + j coc}$ $C = \prod \in$ $electoic field$ $Jn (2D)$
ر د د د د د د د د د د د د د د د د د د د	$70 = \sqrt{R+j\omega_1}$ $C_7 + j\omega_2$ $C = \Pi \in$ $ \rightarrow \text{magnetic field}$ $TT \qquad (2D)$ $TT \qquad (2D)$
ر د د د د د د د د د د د د د د د د د د د	$70 = \frac{R + j cul}{c_T + j coc}$ $C = \prod \in$ $ \text{ magnetic field}$ $ \text{ magnetic field}$
ر د د د د د د د د د د د د د د د د د د د	$70 = \sqrt{R+j\omega_1}$ $C_7 + j\omega_2$ $C = \Pi \in$ $ \rightarrow \text{magnetic field}$ $TT \qquad (2D)$ $TT \qquad (2D)$
ر د د د د د د د د د د د د د د د د د د د	To = R+jaul CT + jac CT + jac C= TE Delectoic field Im (2D) > magnetic field IT (2D) microstaip Toursmission line Toursmission line
ر د د د د د د د د د د د د د د د د د د د	To = R+jaul Cn+jwc C= IIE Held
ر د د د د د د د د د د د د د د د د د د د	To = R+jaul c + jac C = IIE > magnetic field Im (2D) > magnetic field Im (2D) Till microstaip Toursmission line 7 7 7> c metal slot dielectoic material

	Date: / /		
9.	* explain and days electoic field do magnetic		
2-7	field in marial x'mission line do troo wise		
	Pasallel Lo micro-staip x'mission line!		
	K TEM MODE [Toursverse electoic magnetic mode]		
	it's means electric do magnetic field perpendicular		
	to papagation.		
	Z=) direction of papagation electric &		
	magnetic couve la language		
7.04	Fz & Hz = Of - Z acxies		
	where 2 is direction of propagation		
	Total control of the second of		
6	anim to xatamah : - h		
SINN A	c Irabi 407 O see 21 4		
an h	HY 08 FY		
77.01	=) In 4 circles these could		
	be mugmetic field or electric		
	field		
	The x civilag there		
	could be clocked to component in direction		
	field do magnetic field		
100	TICIS		
*	TF - mode [Toursvease electrical mode]		
,	electatic mode I non a life		
	7 Three non of papagation,		
	diaection Of papagation		
	(Fz=0) (Hz= may not be zero)		
_	electoic field their ray		
11.5	axies due to TE-mode		
	Ez = 0 where $z = 0$		
	disection of popogation		
ia ji	resource 2		
	X . T. Dye to TE-mode HZ may not be zero		
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	Page: Date: / /			
*	TM Mode! (Tounsvegse magnetic mode)			
	Z diaection OF papagation Hz = 0			
Ez may not be zero				
	α L			
	EX & H2			
N4				
*	equivalent ciacuit of Tagnamission line.			
3-1	R I			
	the Hart of the State of the Late			
	C + 3 G			
	L R SICH			
	THE PROPERTY OF THE PARTY OF TH			
Fx	TF two purallel wire ximission line servated by			
	2mm and diameter OF wire is 0.1 mm is			
	given for 1055 less x mission line colculate			
	1> L (E) D MC 1 D O M 13 + ich impedance			
	Coloria has ord Dirties			
	1 = 4 dn (20)			
	$\frac{1}{\pi} \frac{4\pi \times 10^{\frac{3}{4}} + 2\pi \times 10^{\frac{3}{4}}}{0.1 \times 10^{\frac{3}{4}}}$			
	π ο.1χιδ3 /			
	= 14.75 X 1.0 H			
	2 £ >001.5 ¹			
	$C = \pi \in \pi \times 8.85 \times 10^{14}$			
	In (8D) ml. (40) ml.			
	= 84+1.53 × 1014 F			
-	the same of the sa			
ek.				

	Page: Date: I
	$7 = \sqrt{\frac{R + i\omega I}{G_1 + i\omega C}} \implies 1055 \text{ less } x'\text{mission line}$
	R
-	$= \sqrt{\frac{L}{C}}$
	$= \sqrt{\frac{14.75 \times 10^{7}}{14.000}}$
	7.53XIO 14
	$= \sqrt{1.95 \times 10^{4}}$ $= \sqrt{19.5 \times 10^{6}}$
	$= 4.41 \times 10^3 - \Omega$
Fx	for x'mission line R.L. OT.C is given by S.L. IS mH. O.I T. I HF respectively if operation freq in since character of impedance the x'mission line
12-1 h	$\frac{70 = \sqrt{R + icol}}{\sqrt{CT + icol}}$
<u></u>	$= \int_{0.1}^{1} \frac{5 + j \left(1 \times 10^3 \times 2\pi \times 16 \times 10^{\overline{3}}\right)}{0.1 + j \left(\int_{0}^{1} \times 10^3 \times 2\pi \times 1 \times 16^{\overline{6}}\right)}$
	= 5+30π3 13
	· - Trxic in (crxic V
	$= \sqrt{\frac{94.38 \times 86.96}{0.100 \times 3.5}} \qquad \boxed{\text{POLC.151.3017} = 94.38}$
0438 5	S Alpha (+an) = 86.96
86.96	= \ \ q.438 \ \ \ 2 \ \ \ \ \ 2 \ \ \ \ \ \ \ \ \
	= \ \ 948.8 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
	E 30.72. / . 41.73.
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	are multiply & divide ∂Z $I(Z + \partial Z) = I(Z) + \partial I(Z) + \partial Z$ $I(Z) - I(Z + \partial Z) = I(Z) + \partial I(Z) + \partial Z$
	$\frac{3z}{2}$
	foom eq (2) & (3) prozi)
	$\frac{32}{-31(5)} \frac{34}{34} = \left(\frac{34}{2} + \frac{44}{34}\right) \frac{34}{34} = \frac{34}{34} = \frac{44}{34}$
	$\frac{\partial I(7)}{\partial z} = -\left(\frac{GT + C \cdot d}{dt}\right) V(z) =(4)$
di	#hat d = 100
6 15 7	$\frac{\partial T(7)}{\partial z} = -\left(C_1 + i\omega_C\right)V(7) =C_5$
	$\frac{3\sqrt{(z)} = - \left((3\pi + c)(x) \right)}{3z}$
1	$\frac{2N(z)}{2} = -\left(\frac{R+j\omega L}{1}\right) \frac{1}{2} \frac{(6)}{2}$
	By differentiator eq 7 (67 w.v. t 17
	$\frac{\partial z_{g}}{\partial z_{g}} = - \frac{\partial z}{(k + i\omega r)} \frac{\partial z}{\partial z}$
	From eq (s)
	$\frac{\partial^2 V(z)}{\partial z^2} = \frac{(R+r)\omega(1)(\cot + \omega(1))(\cot + \omega(1))}{(\cot + \omega(1))(\cot + \omega(1))}$
	This eq n is simillar to papagution eq n
	Saannad by Cam Saannar

	Page: Date: / /
	32v = x2v 8
	925
	7 = papagation constant
	The state of the s
	$\gamma = \sqrt{(R + j\omega L)(\sigma + j\omega c)}$
-	popogation constant have two abitary value a caeal)
	Lo B (Imagneray)
	611.3
	a = attenuation constant
	β = Phase constant
	$\gamma = \alpha + j\beta$ $\gamma = v_1 = \gamma^2 + v_2 = \gamma^2$
	$\frac{1}{(\alpha + j\beta)z} = \frac{1}{(\alpha + j\beta)z}$
المنظيلية المنظمة المن المنظمة المنظمة	$= \frac{1}{\sqrt{1 - (\alpha + j\beta)z}} + \frac{1}{\sqrt{2} - (\alpha + j\beta)z}$ $= \sqrt{1 - \alpha z} - \frac{1}{\sqrt{2} - \beta z} + \frac{1}{\sqrt{2} - \alpha z} + \frac{1}{\sqrt{2} - \alpha z} = \frac{1}{\sqrt{2} - \beta z}$
	moident ouve Reflected wave
	COVERSE COVERS
_	j modeuse = (VI e e jbz) decoease
	$C_{\gamma} = \frac{1}{2} e^{\gamma z} + \frac{1}{2} e^{\gamma z}$
	incident Reflected.
	(115) (115) (11so) 6 + 7 / 2 /
Ex%-	R = 5_A
	L = ISMH Con San Sillhour Con S
	CJ = 0.1U
	C = 1.91F
	F = IKH2
	$\gamma = \sqrt{(R + j\omega L)(C\tau + j\omega C)}$
	2 -2 - 6 - 3 - 6 -
	$= \int (s+i(e\pi \times 1 \times 10^3 \times 15 \times 10^3)) (0.1+i(e\pi \times 1 \times 10^3 \times 1 \times 10^6)$
E.F.	

標:	Date: / /
	= \((5+ i30π) (0.1 + j0.002π)
	incl achieve.
	= (94.38 / 86.96) (0.100 / 3.59)
94.38× 0.10	
86.96+	= \ 9.438 / 90.55
2,39	A month of the end of
-	= (3,072, 45,27) Rer (3,072, 45,24)
-	= 2.13 + j 2.18 Alpha (+an)
-	Table of a stable of the stabl
	$\alpha = 8.13$ $\beta = 8.18$
	Silver - V
F.X	R. L. CT. C doe given by 50, IMH, O. 17, 1915
	despectively find the cho impedance popagation
	Constant a, B if frequency is IMHZ
	$\gamma = \sqrt{(R + i\omega L)(\omega + i\omega c)}$
-	Singoli i 19 5 181 = Jaon ii 1
	$= \sqrt{(s+jx\sin x \cos^6 x 1x 15^3)} = (0.1+jx\sin x \cos^6 1x 15^6)$
	$= \sqrt{(5 + \frac{2000}{62000}2iπ)(0.1 + iθπ)}$
	S= \ (5 2 0.071) (8.28 / 89)
· X	La L
	= (5.6 / 44.53)
	= (3.99 / 3.92)
	(6283194 012 015) (6000)
	= 1 (6283.18/ 89.95) (6.28/89)
('518	X DIX = X DO 1981. 164 2 DI 89. 47 IX
	= (a 1.83
11	

	Page: Date: / /	<u>-G</u>
	$Z_0 = \sqrt{R + j\omega L}$	
	√ Gr+j@C	
	$= \int 5 + \int (2\pi \times 10^6 \times 10^3)$	
	$\sqrt{\frac{1+j(8\pi \times 10^6 \times 10^6)}{10^6 \times 10^6}}$,
	= 6283/89.94	
	6,28 / 89,08	
	= 31.63 4 0.75 -2	
	popagation constant	
	$\gamma = \sqrt{(R+j\omega L)(G_T+j\omega C)}$	Ŧ
T	= √ (G283 ∠ 89.94) (6.28 ∠ 89.08)	
	= 198.56 / 89.51	
	= 1.69 + j 198.5 0 ×= 1.69	
	α β = 198.5°	
ΕΥ	A x'mission line having following pasameter	$R = 2 \cdot \Omega / \Omega$
1	CT = 0.5 MZT/M L = 10 8 MH/M , C = 0.23 PF,	f= 1C#HZ
	che impedance, T, A, B	7.5711=
		1
-	70 = R+ 101 101+11	1
	V Gr+joc	
	$= / 2 + 0.0 \times 2 \times 10^{9} \times 2 \times 10^{9}$	
	$= \sqrt{2 + 1 \times 2\pi \times 10^9 \times 8 \times 10^9}$ $= \sqrt{63 \times 6.5 + 1 \times 2\pi \times 10^9 \times 8 \times 10^9}$	+
		31
A Comment		
	<u> </u>	

	124.5
	Page: Date: / /
	$= /(2 + 316\pi)$
	(0.0005 + j 0.00046 T)
	- UNUSUS
	= 50.30 <u>/ 87.72</u>
	0.00152 / 70.91
	= 181.9) / 8.40
	= (179.95 + j 26.57)
	$\gamma = \sqrt{(R+j\omega L)(\omega t)}$
	Andreas and the second
	= \((50.30 L 87.72)(0.00152 L70.91)
	(10) + A (10) (+ 4) (1 - 1)
	= (0,876 / 79,31)
	= (0.051+10.07) =
	Phase Welocity = w
	β
	= 21 x 10 ⁹ = 23, 14 x 10 ⁹
	0.631
Ex	R= 6 1 / 1 km , L = 2.0 mH , C= 0.005.91 / km ,
£1105 :	CT = 0.005 STO/KM . f = 1KHZ find a, B, Y
	Phase Velocity.
	$Z_0 = \begin{cases} R + j\omega L \end{cases}$
	V OT + jwc
1	. 0 2
	$= /6 + i 2\pi \times 10^{3} \times 2.2 \times 10^{-3}$
	V 0.005 X106 + 1 X 211 × 108 × 0.005 X106
	li -

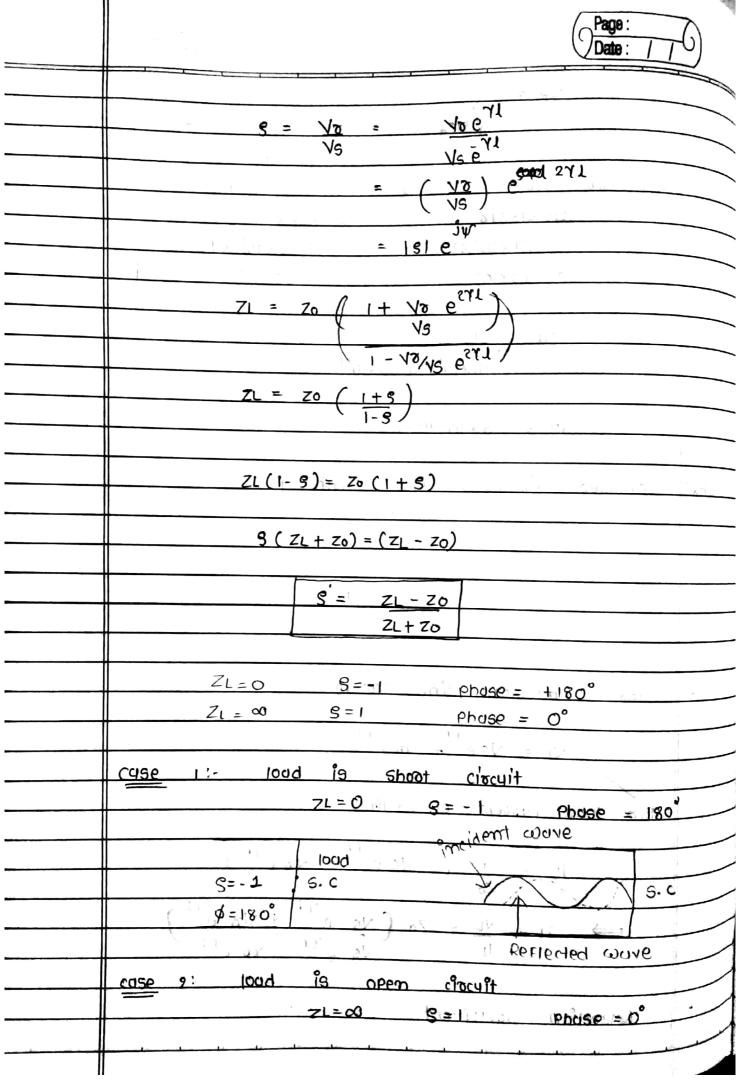
	Page: Date: / /	-6)
0.00000	$= \frac{6 + 14.4\pi}{(6 \times 10^8 + 10^8)}$	
	= (15.06 4 66.59	
	(3.14 × 105 / 89.08)	
	= 692.54 / -11.28	
	$\gamma = \sqrt{(R + j\omega L)(\sigma + j\omega C)}$	
	= \((15.06\)\(66.53\)\(3.14\)\(\sides^5\)\(89.08\)	
	= 0.021++ LA++150.0	
	= d = 0.0217 , B = 77.80	
The second	phase velocity = ω	4-
	= <u>SIIXI</u> 03	
	쿠루. 80 (10), i st 는 5 있는	
	= 0.08076	
grell	1000000000 AMS 10006094 40-11.72 1940 9000	
FX.	A x'mission line has R=8-1/Km, L=EmH/Km, G= 0.04 97/Km, f= 2KHZ, And x, B, Y, Zo,	C=0.0029F/ km
	$70 = \sqrt{R + j\omega}L$	
	Gr+jwc S La 20 10H cassille	
	$= \sqrt{8 + j(2\pi \times 2 \times 10^3 \times 2 \times 10^3)}$	Day of the second
	$= \sqrt{8 + j(8\pi \times 8 \times 10^{3} \times 8 \times 10^{3})}$ $0.04 \times 10^{6} + j(8\pi \times 10^{3} \times 8 \times 0.008 \times 10^{6})$	Property and Personal

	Page: Date: / D
	$= \sqrt{8 + 1811}$
	$\sqrt{\frac{1}{8} \times 10^8 + \frac{1}{8} \times 10^3 \pi}$
	2.0000000000000000000000000000000000000
,	= 06.87 / 12.34
-	35X105 4 89.84
1	
	= 1084.8 2 - 8.45
1	
	7 = V (26.36 × 72.34) (2.51×15 × 89.94
	Lend in the late of the late o
	= 0.025 \(\text{81.13}
4	= 3.98 x 103 + j 0.019
-	3
	$\sqrt{p-\omega} = \frac{6 \times 11 \times 5 \times 10^3}{10^3}$
	= 5.02 x 10 ⁵ Km/3
State of the	- 5,0c A 100 5 101/2
8 *	che impedance of x'mission line :-
The state of the s	ose hove seen ximission line eq n
	$\frac{dy = - (R + j\omega L) I}{dz}$
	ae have soon sol ⁷ of proposation ximission line
	$V = V_1 e^{YZ} + V_2 e^{YZ}$ $= V_5 e^{YZ} + V_5 e^{YZ}$
· ·	= V5 e T VP e
	Incident Reflected
	14141
漢:	differential V 02.70. + Z
	dy = + Vse + Yvoe
	COLADODIC STREET COLETE TO LEGISLAND

	Page: Date: / /
TE . I I	= 7 (- VS P + Y8 P YZ)
	?. 7 (- NS e + No e YZ) = (R + jwl) I
	$T = \gamma \left(-\sqrt{2} + \sqrt{2} + \sqrt{2} \right)$
	$T = \gamma \left(-\frac{\sqrt{3} e^{\gamma z}}{+ \sqrt{3} e^{\gamma z}}\right)$ $-\left(+\frac{1}{2} + \frac{1}{2} + \frac{1}{$
	= -1 (Vse'2 - Voe'2)
	- (R+jwL)
	= Y (VS e YZ - Yo e YZ)
	R+JOL
	72
	√(R+jωL) (σ+ jωc) (vse ~ vse ~ vs e ~ z)
	R+jwL
	$= \sqrt{\sigma + i\omega c} \left(\sqrt{se^2 - \sqrt{3}e^2} \right)$
	V R+jour
	= 1 (Vs e - Vo e 2)
	$\frac{1}{z_0} = \frac{1}{z_0} \left(\sqrt{s} e^{-\sqrt{s}} e^{-\sqrt{s}} \right)$
((Cic)	In x 1991 Aig! Zo πη! R+jωt ην γης σου = -
-	Here R & Con represent lossy component of ximission lin
-	it is impedance measured from two ends of ximission line provided length of ximission line is ∞
- 1	x 'mission line is loss less! R-by $\sigma = 0$
- 1	

	Page: Date: / /
	Volue OF L&C depend upon dimension to men
	dimension is not change so the impedance is constant still forge is change.
-	Resort present transper change change change to impedence thange to x'mission line.
-	R la CI=O, \alpha=0 => cittenucition is zero
-	γ = α + jβ γ = α + jβ
	$Y = \sqrt{(R+j\omega L)(C\tau+j\omega C)} \qquad \qquad R \cos(\pi = 0)$
	$= \sqrt{j^2 \omega^2 LC}$ $\gamma = j\omega \sqrt{C}$
	$\alpha = 0$, $\beta = j\omega\sqrt{ic}$
~ -	Phase Velocity VP = 1 for loss less ximission inc
hell ell	100 two possile) wise ximiseion line
18.51	in provided tensing of contract has the
	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
	Vic

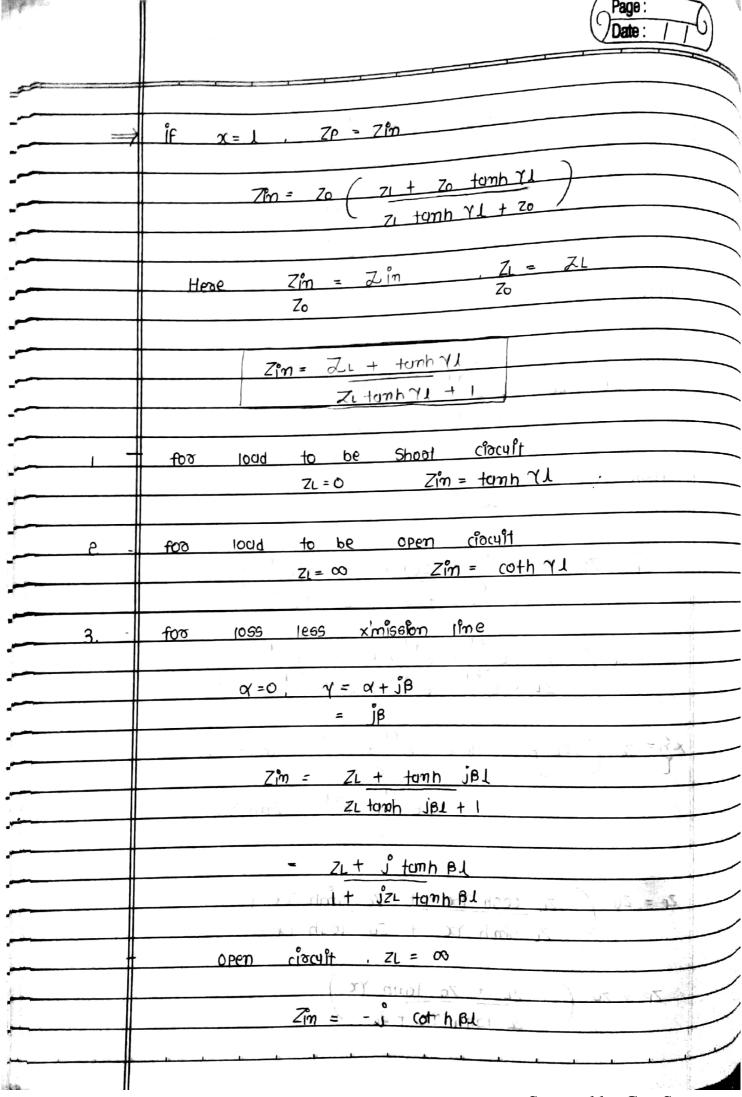
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,	VP = J
,	
	for air sir fo = 1
·	e= 60 fg
	= 411 x 10 x 1 . 8.85 x 10 x L
	= 411 x 10 ⁻⁷ = 8.85 x 10 ⁻⁴
	Vρ = 1
	√4πχιρ̄ [‡] χ 8. 85 × 1ρ̄ ¹⁴
	2.1.
	$\sqrt{P} = 8 \times 10^8 \text{m/s}$
Ex '-	
	Vs e ^{γl} →
	₹ ZL
	Vo e ^{γ1} ∠ _
	k—1—→
_	for x'mission line Voltage
	71 71 NL = V3e + V0 e
	tiposis tosona di erra i acti
	affor load current of x'line
	1000 CUBURIII OF X 11-11-E
	TI = 1 [Vse - yxe71]
	T1 = 1 \ \6 e - \10 e \ \ Z0
	$\Rightarrow 71 = VL = 70 \left(VS e^{-\gamma L} + VO e^{\gamma L} \right)$
	$\Rightarrow 71 = VL = 70 \left(\frac{\sqrt{5} e}{\sqrt{5} e^{\gamma L}} - \frac{1}{\sqrt{5} e^{\gamma L}} \right)$ $= \frac{7}{11} \qquad \frac{\sqrt{5} e^{\gamma L}}{\sqrt{5} e^{\gamma L}} - \frac{1}{\sqrt{5} e^{\gamma L}}$
	tivate conditions they the
-	Reflection coefficient



		e, <u>-</u>	=1 4=100 = 00		<u> </u>	
		2. 5.	3	Pag	e: / /	
		load	Incident coo	ve	ıd	3.7
	8=1	0.C		1300		
	Ø= 0°		7			
			Colloca	ed some		
			Reflect			
Ex:-	7L= 50+je	<u> </u>				
<u></u>	Zo = 75_0	3	. 287 KAD.			
	S = 8					
	3-:		24 ř. + J.			
	9 = 7L	- Zo =	50 + 125 - 75	- =	(-25 t	125
	II —	† Zo	50+j25+75			+ 152
		Nor.	1 - 2 - 5			
		= (85	.35 <u>/ 1</u> 35)			
		(47 41130			
		= 0.277	Z 183.75 M.	n ,		
			Phose			,
	ZL = Z0 =		ا باران عل	VSOR = 1-	19	
	r ¹ 0		06.0			
Eve-	CADSINE ZL +	49		S = VS VS	66 - 1 66 + 1	
<u> </u>	4 4 11 11 27 11 3		5) 35m. (1)	1	* .	
		\	i di	a		
	View	OR = 1+9			<u> </u>	
	N /S	1-9				+
		= 1+0.847				
		10.277				
	-	0/3/23	166	. A		
	-	40,75				
		0:9006		moherad	and L	
	FY 37-		9V = 9			
	3 5V + 3 2V	** ***	37		1	
	di d				\	
<u></u>	II.		teleman til til til til til		V2	

	Page: Date: /	(S)
EX'	Consider 71 = 100 + 125	
	zo = 50-12	
	find VswR &9 9	
	V.July (CO)	
	6 - 7, 70	
	$S = \frac{Z_L - Z_0}{Z_L + Z_0}$	
	= 100+ js - so	
	100+ jes +s0	
	= 50 + jes	
	150 + jes	
35.7	= 63.90 \(\alpha\) 26.56	
	152.06 L 9.462	
	13C:00 L 1, 46C.	
	= 0.367 L 17.098.	
	G:301 Z_11(0)0	
	V50R = 1+9	
	1-8	
	= 1 + 0.36 = 1.36 = 2.125	
	$\frac{-1+0.36}{1-0.36} = \frac{1.96}{0.64} = 2.125$	
	The Land William I	0.00
*	line impedance (6) i/p impedance OF	222
	xmission line	
	ρ	
	Zim	
à	F 7.34	
	$Z \rightarrow P'_{\downarrow} \xrightarrow{\chi} \chi_{\downarrow} \chi_{\downarrow}$	
6 5 5 3 4	K—————————————————————————————————————	
	line impedance	
All the second		
	TP = VP YP = VS e + V8 e	
Les .		

Sinc = Sinx Page: Here V9 $\frac{ZP = Zo \quad \left(e^{-\gamma x} + g e^{\gamma x}\right)}{\left(e^{-\gamma x} - g e^{\gamma x}\right)}$ Here S= ZL + Zo $\frac{e^{-\sqrt{\chi}}(z_L+z_0)+(z_L-z_0)e^{-\chi\chi}}{e^{-\sqrt{\chi}}(z_L+z_0)-(z_L-z_0)e^{-\chi\chi}}$ ZL + 20 tonh Yx Z tonh Yx + 20 /



. 1			Page: Date: / /
-	Shoot clocuit ZL = O		
		L Ch av edko	a comity
	19.71		and the same of th
_	length of x'mission li	ma 7/4	er const
	$Z_{\rm in}^{\rm in} = \infty$	116	
	$Z_{\rm in}^{\circ} = Z_{\rm L}$	+ million - May	V
	tanhje	BJ OWY	
	ZL +	1 + 11 1 1 m	4
		Hampier	
		(21+12)	
		181-1	
	ZL		
		La RURY	2
*	Voltage Standing wave	outio (VEMR)	" c'
3-25	1/P signal	D 9 pm pc	
	77 3:3:4:		+ Ve ? in Phuse
		-Ne	- ve J
		1994 F 133	?
-		+ ve	-ve gout of phase
	Reflected signal	9 + 11 + 8	W.P.V. 35
	/		
	Y	1.5	
	mux	\	
•	/min =	žo.	V 10 10 10 10 10 10 10 10 10 10 10 10 10
		\t	
	150 - 20 ·	1/2 =	NWAY 33
	if the i/p voltage	is yı	
	& Reflected Voltage	le ve	
	Not recise items.		
	10.00		
t die			
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75	
	$\sqrt{mox} = \sqrt{1 + \sqrt{e}} = \sqrt{1 + \sqrt{1 + \sqrt{1 + 1}}} = \sqrt{1 + \sqrt{1 + 1}}$
	Vmin = V1 - V2 = V1 (1 - V2) = V1 (1 - 181)
	VSWIR = Vmux
	Vmin
+	
	$= \sqrt{(1+ g)}$
	VI (1-181)
10	= 1 + 181
	1-18
-	
	5 = 0 , VSWR=1
	S = 1 , VSWR = 00
E L	V5wR ognge 1 to ∞
	S = ZL + Zo
120	ZL + Zo
	VSWR = 1 + (ZL - ZO)
Action of the control	ZL + Z0
	1 - (ZL - Zo)
	$\frac{1-\left(\begin{array}{c} z_{L}-z_{0} \\ \hline z_{1}+z_{0} \end{array}\right)}{}$
→	if ZL7ZO + if ZL <zo< th=""></zo<>
	7 17 21 20
174	VSWR = ZL VSMR = ZA
	$\frac{VSWR}{Z_0} = \frac{ZL}{Z_0}$
	IN A SERVICON OF THE THE
	ST SEDILOV DUDITION OF THE SEDILOVERS
The state of the s	
VI.	
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$I_{min} = V_{min}$
Imax
= Vs(1-151)
= <u>Vs(1-151)</u> 1 vs(1+151) 2.
Zo
= 70 (1-181)
$= Z_0 \left(\frac{1-181}{1+181}\right)$
= Z ₀
VSQR

		20 (1)(1)			AZOR		
				- La J		*	
îf	<i>7</i> ι =	60 <u>-</u> Ω-	රග	Zo = 50 A	then	find	
Refu	ection	(O- effie	cent,	VSOR, Z	mux ,	Zmlm	
ÎF	Î/P	voltage	ใร	1 V them	find	Vmax	.Vmm
		n.			-		,

_			
	- t	S = ZL-Zo CHILL - ALLE	
_	AHU.	ZL + Zo page -	
		= 10	
	رز	110	

= 0.090 SO

*

<u>Ex'-</u>

ame

 $7 \text{ max} = V_{\text{max}}$

Vs (1+191)

= 70 (1+191)

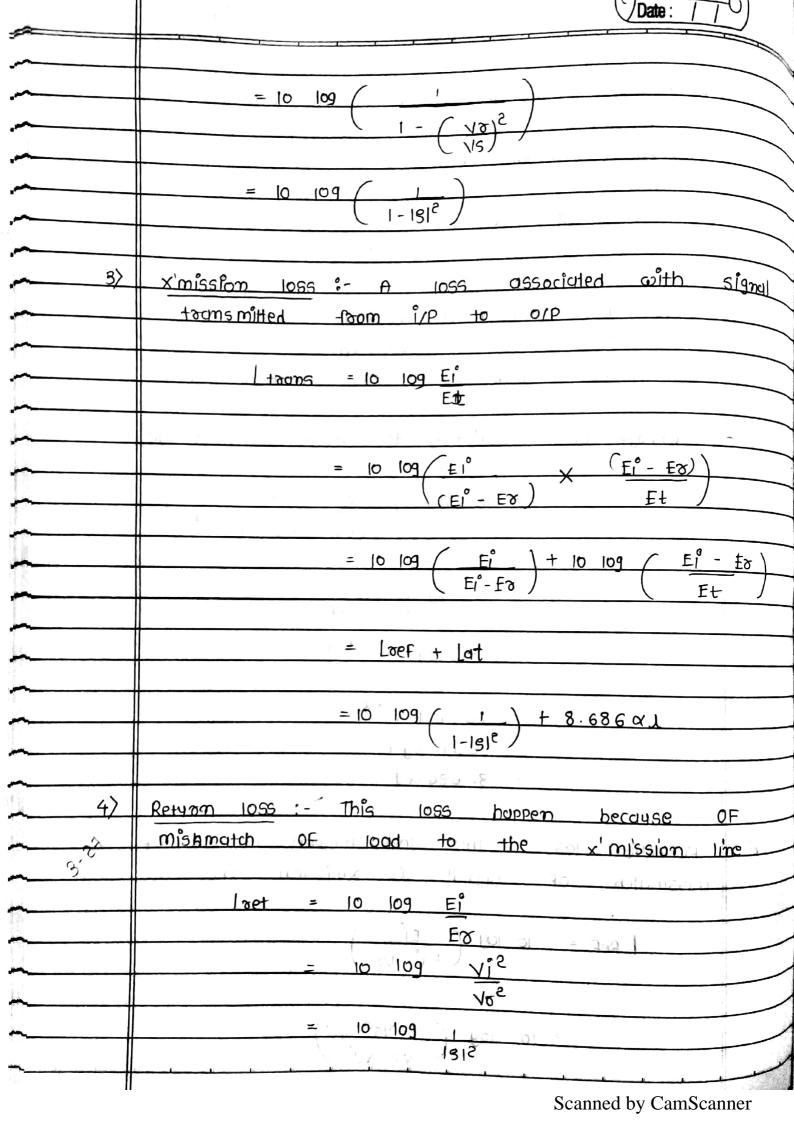
Xa (1-151)

V5WR = 1+151			
1-181	marilon i.	(II)	-
= 1+0.09			4-1-
1-0.09	320)	Hotelman	
= 1.09 =	1.19	Keledion.	1
0.91	1053	(F61H)0	

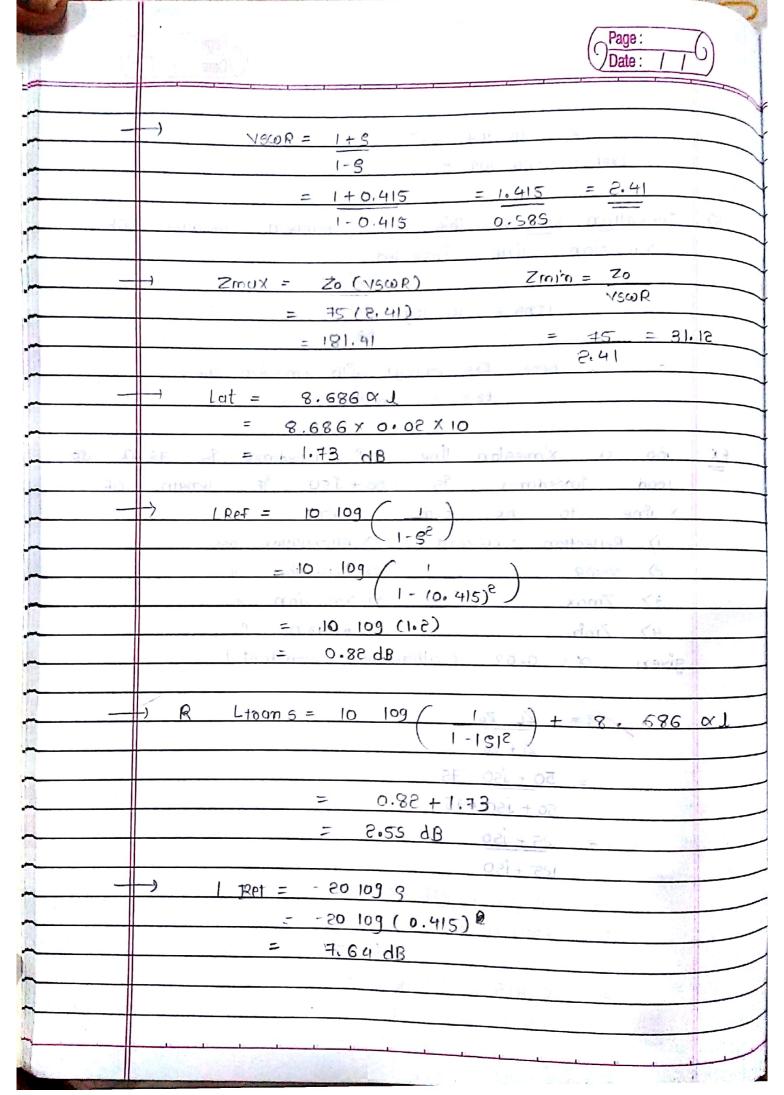
Zmax = Zo (YswR) 2001 milion x -

_		
	7mim = 20	
	VSWR	
	<u> </u>	
	1.19	
A	V5 = 1 V	
 	S = VR	
	V5	
	VR = 8 x VS	
,	$= 0.09 \times 1$	
	= 0.09 \	
-	\\ \frac{1}{2} \\ \fr	15
	Vmax = 15+ 18 Vmin = 15- VR	
	= 1+0.09 = 1-0.09	
	= 1.09 v = 0.91 V	
	Tmux = Ymm Tmim = Vmux	
	$\overline{Z_{min}}$ $\overline{Z_{myx}}$	
	= 0.91 = 1.09	,
	42 60	
	= 0.081 $= 0.018 A$	1
	= 21MA 18MA	
	101 # 1	
*	losses in X'mission line :-	
	1C+1.5	
-	Attenuation loss	
-	Reflection 1055	
-	vetuva) 1055	
	x'mission loss	
-	insertion loss	10
	A STATE OF THE STA	

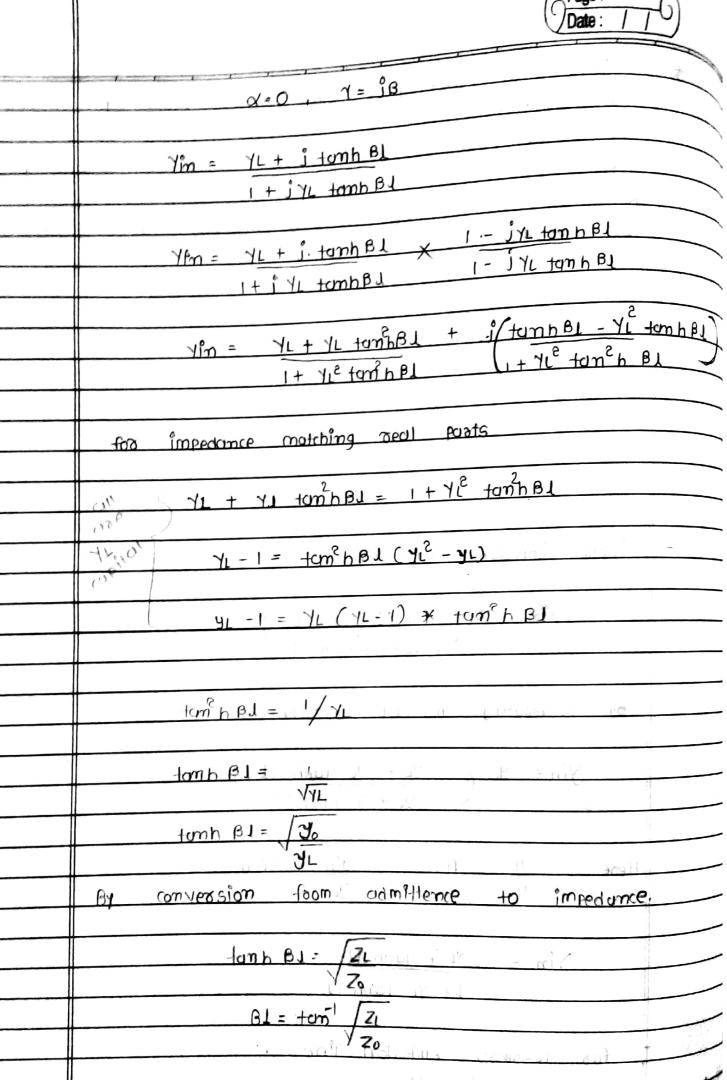
,	Date: / /)
	Attenuation 1055: This 1055 happen because of	
	absorbtion of Signal while it progation	
	though x'mission line	
	Lat = 10 109 (El-Er)	
	Et	
	Here Ei = energy OF incident signal	
	Fr = " Reflected "	
	Et = Total energy of popagated signal	
	energy is prostional to square of voltage	
	$= 10 \log \left(\frac{(\lambda^2 - \lambda^2)}{\lambda^2 - \lambda^2} = S\alpha T \right)$	
	(V3°- V8°) e - (V3°- V8°)	<u></u>
	= 10 109 (- 501)	
	= 10 109 (6 ₅₄₇)	
	·	
	100000 = 80 10900e 91	
	= 60 a) 10g e	
	Attenuation loss = 8. 686 al	
7	hirad sea e This icse harren tissee	+
رد.ع	Reflection loss: This loss huppen because of	
	missmutch OF signal do x'mission line	
	POI 0 = 196	and the state of t
	Ref = 10 109 (Ei)	
	PoV	
	= 10 10g ((Ng ²) / Vg ² - Vg ²)	



	Page: Date: / /
	= -10.109 181 ²
	Lzet = -20 109 g
5>	insertion loss: This loss happen because of
	x'mission line inserted
	Ins = 10 log E1
	Ea
	here EI = energy with ximission line
	Fz = 11 mithout 11 11
<u> </u>	for a x'mission line cho impedance is 75-0 do
	100d Impedance 13 50+J50 IF length OF
	x' ime to be 10 m acculate.
	i) Reflection co-efficient 5> Attenuation loss
	e) vswr 6) reflection 1
	3> 7max 7> x'mission 11
	4> Zmin 8> Return "
	given $\alpha = 0.02$ (afternuation constant)
	S = ZL - Zo
	Zi + Zo
	= 50 + 150 - 75
	50 + j50 + 75
	25 + JSO
	125 +150
	= 55.90 <u>/ 116.56</u>
	134.68 4 21.80
	= 0.415 L 94.76



	Page: Date: / /
*	Impedance Matching :- it is essentiale to pamer xifer theorem
-	Based on paoper tuning of impedance power get
_	Reflection from line to loud depends on cultivation Of impedance
-	(dults of stub)
	Zo d ZL
	of stub)
\rightarrow	input impedance of xime
	7in = 70 (71 + Zotemb Y) Zo + ZL +omh Y)
	By tamplating this eq a colmittience
	Yin = Yo (JL + Yo temb Y) yo + JL temb Y)
1	Here YL Ym = Ym Yo Yo
	$y_{im}^{*} = y_{L} + t_{amh} \gamma_{l}$
	for lossless x'mission line
	$\gamma = \alpha + \beta$



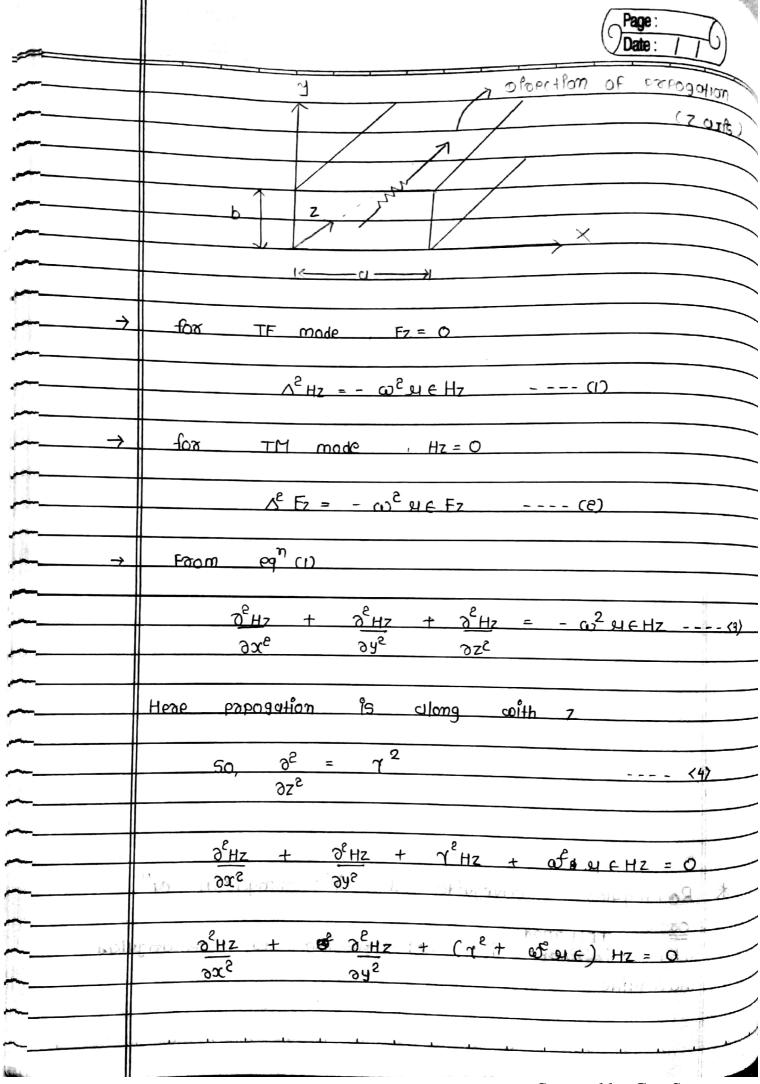
(C	Page: Date: / /	<u>(</u>
	BERT)	
	$1 = \gamma + \sigma n^{-1} \sqrt{ZL}$ $2\pi \sqrt{Z_0}$	
	2π √ Zo	
	b = tunhBl - Die tunhBl	
	1+ 312 tamp B1	
	22	
	$b = \frac{\tanh \beta J (1 - y^2)}{1 + y^2 + \tan^2 b \beta I}$, r= 8.5
	1+ JL taneh Bl	
	b = 1/VII (1- YLE)	
	1+415/1)	
No.	1 + yL2 (1) = 1 + yL2	
un h	9L	1x1
, B	71 + 912 - 1 2 + 912 - 1	(1+41)
dele	to actions as attend that made stated	
	being the graphes mi agoes a avery of	
	√yL	
	Townsinfering eq from admittance to impedance	
	$b = \frac{1 - \frac{1}{ZL}}{L}$	
	Z _L	
	h = ZL-1	100
	$b = ZL - 1$ \sqrt{ZL}	
	Here $\mathbf{Z}_1 = \mathbf{Z}_L$	
1	Zo	17
	The second secon	4-00
	b= ZL-ZD	
	V2L Z0	

2	Page: Date: / /	
	from exprominet value of b is cot B1	
	$\cot \beta J' = ZL - ZO$ $\sqrt{ZL} ZO$	
	fan $\beta J' = \sqrt{Z_1 Z_0}$	
	$Z_L - Z_O$	
	$2\pi \frac{1-20}{2L-20}$	
	If the impedance OF X'line is 50.0 teaminated placed to be 60.0 if operating trees is	
	II • • • • • • • • • • • • • • • • • •	
\longrightarrow	1 CTHZ then find length do Position OF str	
\rightarrow	1 CTHZ then find length do Position OF state house a proper impedance matching. $Z_0 = 50 \Omega$ $f = 1 \text{ CTHZ}$ $Z_L = 60 \Omega$	
<u>→</u>	I CTHZ then find length do Position OF state to have a proper impedance matching. $Z_0 = 50 \Omega$ $f = 1 \text{ CTHZ}$ $Z_L = 60 \Omega$ $T = C$ $T = C$ $T = C$	
<u>→</u>	I CTHZ then find length do Position OF state to have a proper impedance matching. $Z_0 = 50 \Omega$ $f = 1 \text{ CTHZ}$ $Z_L = 60 \Omega$ $f = C$ $\gamma = C$	
<u>→</u>	I CIHZ then find length to Position OF state in how a proper impedance matching. $Z_0 = 50 \Omega$ $f = 1 \text{ CIHZ}$ $Z_L = 60 \Omega$ $= 3 \times 10^8$ $= 0.3 \text{ m}$	
<u>→</u>	I CTHZ then find length do Position OF state him to have a proper impedance matching. $Z_0 = 50.\Omega \qquad f = 1 \text{ CTHZ}$ $Z_L = 60.\Omega \qquad \qquad 7 = C$ $= 3 \times 10^8$ $= 3 \times 10^8$	
<u>→</u>	I CITHZ then find length to Position OF State to have a proper impedance matching. $Z_0 = 50.\Omega$ $f = 1 \text{ CITHZ}$ $Z_1 = 60.\Omega$ $= 3 \times 10^{8}$ $= 0.3 \text{ m}$ $1 = 7 + 40\pi^{-1} / Z_1$ $2 = 7 + 40\pi^{-1} / Z_2$	
<u>→</u>	I CIHZ then find length do Position OF State house a proper impedance matching. $Z_0 = 50 \Omega$ $f = 1 \text{ CITHZ}$ $Z_1 = 60 \Omega$ $= 3 \times 10^3$ $= 0.3 \text{ m}$ $= 0.3 \times 10^3 \text{ for } / Z_0$	

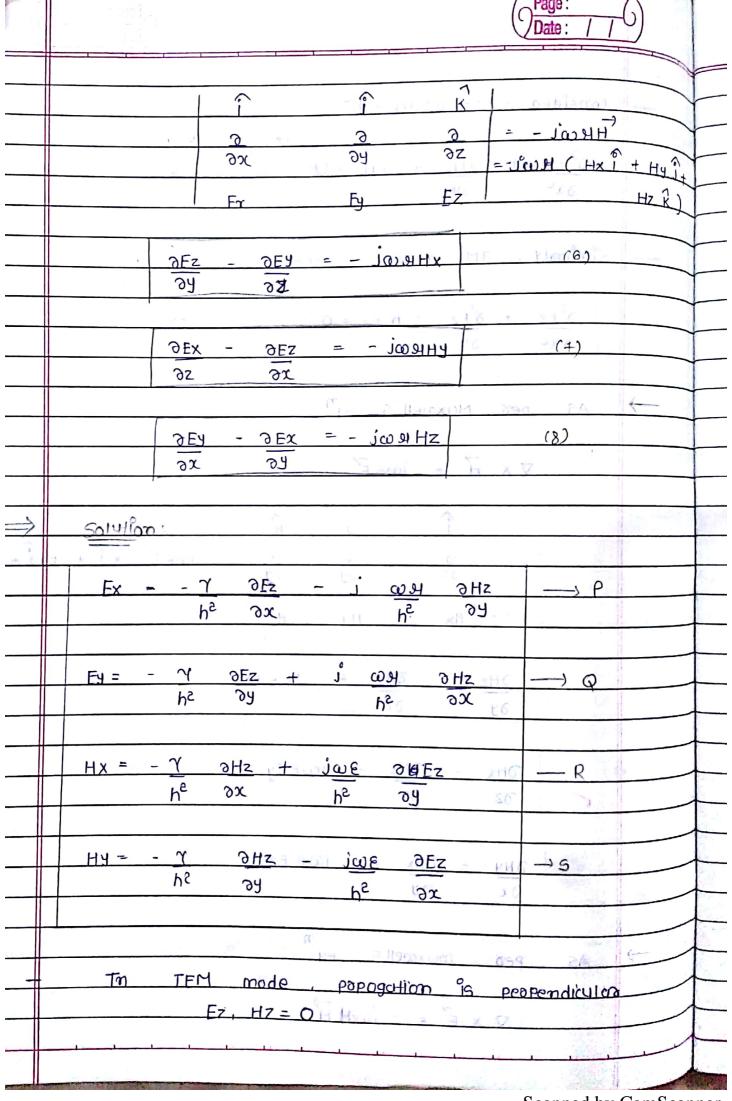
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	$\frac{2\pi}{2} = \frac{2\pi}{2} + \frac{4\pi}{2} \left(\frac{\sqrt{2L \times 20}}{2L \cdot 20} \right)$
	= 0.066 m (2000) $= 0.066 m (2000)$
	Tf x'line operating ut 0.1 m terminated by 90.0 loud huving the impedance of 100.0 Calculate length to position of 5146 to have
	proper impedance matching
	7 = 0.1
	$Z_{L} = 90 \Omega$ $Z_{0} = 100 \Omega$
	20 = 10032
	$J = 7 tan^{-1} \sqrt{ZL}$ $2\pi \sqrt{20}$
	= 0.1 tun /90 211 /100
	= 0.012 m
	$e^{1} = \frac{1}{2} + e^{1} \left(\frac{\sqrt{2L} \cdot Z_0}{2L - Z_0} \right)$
	$= \frac{0.1}{2\pi} + \frac{\tan^{-1}(\sqrt{9000})}{(-10)} + \frac{0.1}{2\pi} + \frac{(-1.48)}{(-10)}$
	= 0.0266 M
-; X3	For x'line RICTC close given by 5-2. 1 SIH, 2PF.
	0.17 Repectively for 1 MHz freg calculate
	1) cho imepedance Zo 3) cittenuation constant &
	e) papagation constant (4) phase constant &

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	Date: / _/
-	→ S = Z1-Z0
	Z1+Z0
	= 50 - 8.07 ⁻ J° 3.88
1	So + 8. 00+13.88
	30 10 10 10 10 10 10 10 10 10 10 10 10 10
	= 48.15 4- 5.88
	58.18 \(\) 3.82.
	1 J. 10 11 11 11 11
	= 0.724 \(\tau - 9. \)
	→ VSWR = 1+8
	1-9 2 11 11 11 11
	= 1+0.784
	1-0.724
	= 6.24
	-> 7max = 7. (VSWR)
	= 8.96 (6.24)
	= 55.91
``	
	-> Zmin = Zo polu a nonegour acal
	√5 ∞ R
	= 8.96 = 1.43
	6.24
_	
_	
*	Roctongular maneguide do it's prepagation eq
	A20
~	why Therease is not possible to rectangular
	wassagage and a second a second and a second a second and
-	
-	

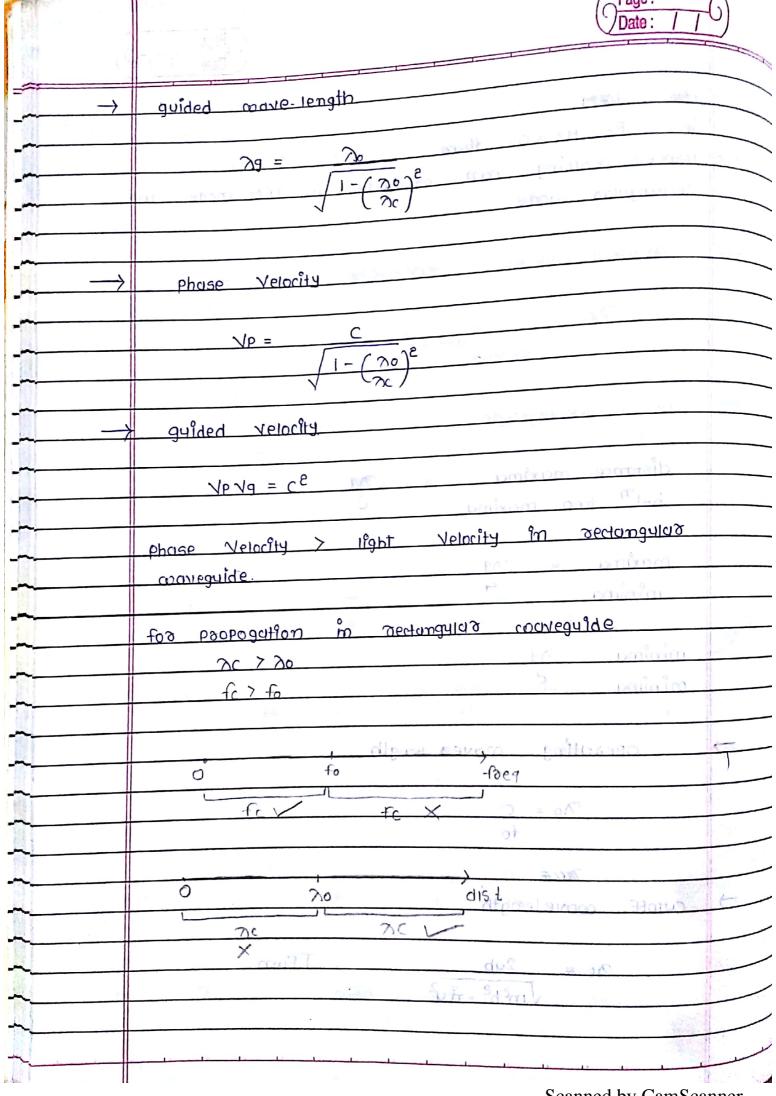


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,	consider $\gamma^2 + \omega^2 + = h^2$
	$\frac{\partial^2 Hz}{\partial x^e} + \frac{\partial^2 Hz}{\partial y^2} + h^2 Hz = 0$ (3) eq (1)
→	Similarly, TM mode $\frac{3^2 Ez}{300^2} + \frac{3^2 Ez}{30^2} + h^2 Ez = 0 \qquad (6)$
→	As per Muxmell's eq ^{η} $ \begin{array}{cccccccccccccccccccccccccccccccccc$
	$\frac{\partial Hz}{\partial y} = \frac{\partial Hy}{\partial z} = \frac{\partial u}{\partial z} \in FX$ $\frac{\partial Hz}{\partial z} = \frac{\partial u}{\partial z} \in FY$ $\frac{\partial Hx}{\partial z} = \frac{\partial u}{\partial z} \in FY$ $\frac{\partial Hx}{\partial z} = \frac{\partial u}{\partial z} \in FY$ $\frac{\partial u}{\partial z} = \frac{\partial u}{\partial z} \in FY$ $\frac{\partial u}{\partial z} = \frac{\partial u}{\partial z} \in FY$ $\frac{\partial u}{\partial z} = \frac{\partial u}{\partial z} \in FY$ $\frac{\partial u}{\partial z} = \frac{\partial u}{\partial z} \in FY$ $\frac{\partial u}{\partial z} = \frac{\partial u}{\partial z} \in FY$ $\frac{\partial u}{\partial z} = \frac{\partial u}{\partial z} \in FY$ $\frac{\partial u}{\partial z} = \frac{\partial u}{\partial z} \in FY$
	$\frac{\partial x}{\partial x} - \frac{\partial Hx}{\partial y} = \int_{0}^{\infty} \omega e Ez \qquad (5)$
\rightarrow	As per mox well's eq $\nabla \times \vec{F} = -j \omega H H$

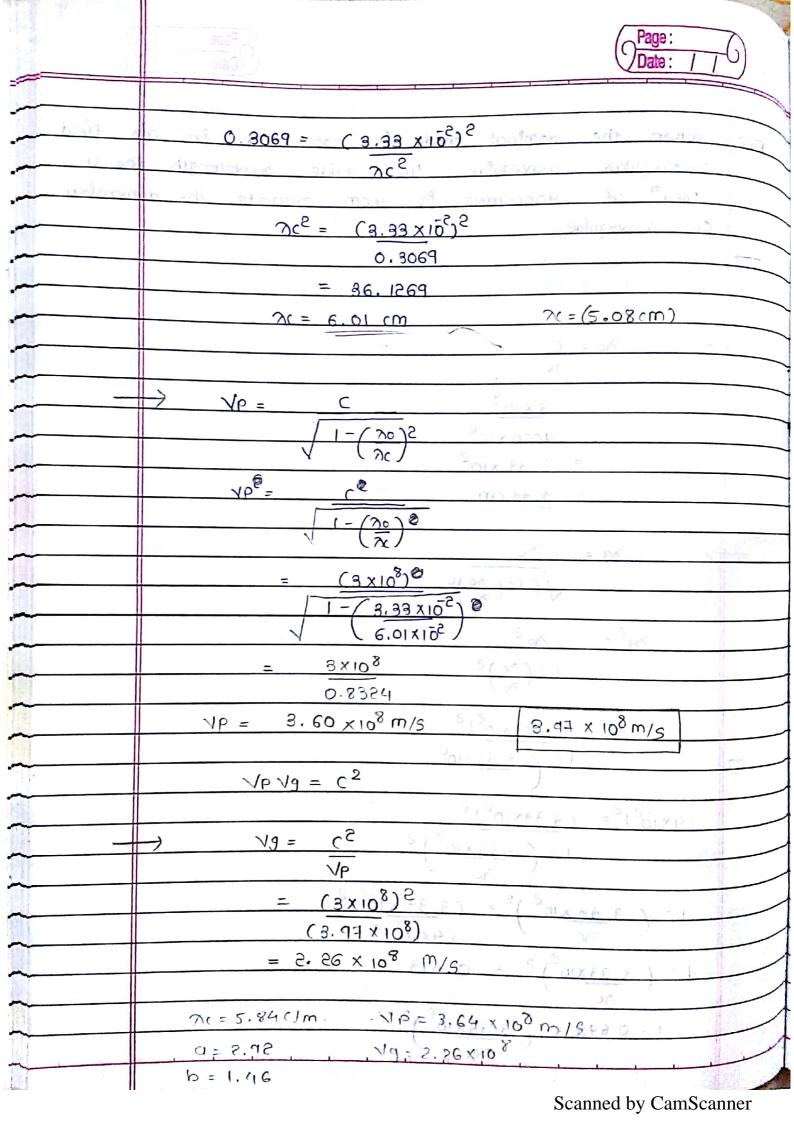


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	information of the second control of	•
	efon Train	No. of Marie
-	if Fz. Hz = 0 them =) Fx Fy. Hx. Hy = 0	
-	Hence nothing can papagate in TEM mode for	
and the same of th	mertangulas mode	
	CO = 1	
\Rightarrow	Dominul mode - TETO mode promin=0	
	$\int w_{\xi} P_{\xi} + J_{\xi} Q_{\xi}$	
	$\sqrt{w_s p_s + v_s q_s}$	
	guided wavelength :- ginney having	
-	distance maxima = 719.	
	bet ^m troo maxima	
	CORP. Vermily 2 alost Vehicley to concernations	
_	$\frac{\text{maxima}}{2} = \frac{\sqrt{3}}{4}$	
	เขาเด้น	
	galugarous appropriation on contrapages sof	
_	minimu = 719	
	minima ^c	
	12	
\rightarrow	operating conver-length	
	20-6	
	$\gamma_0 = c$	
	244. =	
	THE F	
	Cutoff coovelength	
	nc = 2ub TEmm	
	$\sqrt{m^2b^2+\eta^2c^2}$	
	Y.III.D. T.III.Y	
(



Fx	cohen the dominal mode is propogated in air field
	sectangulas acavegulae the guide acavelength for a
	freq of 9000 mHz is 4cm culculate the dimension
	of couveguide.
\rightarrow	79 = 4 cm
	-f = 9000 mHz
	444
	\rightarrow $\lambda_0 = C$
	fo
	= 3×108
	9000 X 10 ⁶
	= 3.33 x 10°
	= 9,33 cm
	$\frac{1}{2}$ $\frac{1}$
	$\sqrt{\left(1-\left(\frac{20}{30}\right)^2\right)^2}$
	24g = 20 €
	1-(20)2
	nc)
	$\times 5 = (3.33 \times 10^{2})^{2}$
	1- (3.33x10 ²
	$(4x10^{6})^{6} = (3.33x10^{6})^{6}$
	$\frac{1-\left(\frac{3.33\times10^{-6}}{30}\right)^{2}}{30}$
	nc)
	$1 - (3.33 \times 10^{2})^{2} = (3.33 \times 10^{2})^{2}$
	$\frac{1}{2}$ $\frac{1}{2}$
	$1 - (3_{33} \times 10^{6})^{2} = 0.693$
	ne
	$1 - 0.698 = (3.33 \times 10^{2})^{2}$
	nc)



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Ex	determine the refor dominal mode in rectangular
	couveguide is in cm for 2,5 CTH7 signal propagated
	in this conveguide in dominal mode concurate 29,
	VP , Vq ,
	aphagama habita 0/=100m
\rightarrow	fo = 2.5 x 10]
	U= DXS h= 1cm
	$\rightarrow \gamma_0 = C \rightarrow \gamma_C = 2 \times 10$
	fo = 20 cm
	$= 3 \times 10^8$ $= 0.8 \text{ m}$
	6.5 x 10 9
	= <u>0.1em</u> (11.60.3
_	$\gamma_{g} = \gamma_{0}$ show out (1 2006)
	$\sqrt{1-\left(\frac{y_0}{y_0}\right)^2}$
	(nc) done = Nc = Nc
	= 0.12mm - acov
	$\sqrt{1-\left(0.12\right)^2}$
	4 (0.8)
	= 0.15 m
	YP = C
	1-(70)2
	7 711
A.	$= 3x10^8$
	/I-(0.12)2(1000)
	V (o.e)
	= 3.75 x108 m/s m 83.4
_	$y_9 = c^2 = 2.4 \times 10^8 \text{m/s} = 2.4 \times 10$
	VP = ST
	(3 x108)2
	(8,75x108)

		-
	Page: Date: / C	
		1
ϵ_{\times}	The dimensions of conveguide use 2.5 x 1 cm	2
habapaa	-fo = 8.6 CTHZ	
(1)	1) find possible modes	e
N.	2) cutoff faeq"	_
	3> guided waveguide.	_
	$q = 2.5$ $b = 1 \text{ cm}^2$	
	fo = 8.6 × 10 ⁹	_
	01 200	
	$\sqrt{20} = \frac{C}{C} = \frac{3 \times 10^8}{6}$	_
	-fo 8.6 × 10 ⁹	_
	= 0.03m	_
	0.05(1)	_
	Accomp 1> TEIO mode	_
	Those those	_
	7c = 2ab = ex2.5x1	_
	$\sqrt{m^2b^2+r^2a^2}$	
	7/31/0 / - 1 /	
	= 500 5 cm	
4	m 200 =	
<u> </u>	$\rightarrow \qquad \qquad$	_
	1- (no)e.	
<u> </u>	\ (nc)	
	Var V	
	- 0.034	
The second secon	1-(0.034)2	
	5xiōe	
	= 4.63 cm 2\m 2\x 2+ 8	
	UIA CT H	
	$\Delta c = a c a c a c a c a c a c a c a c a c$	
	fc	
City Spanish		
1	Court a series	سسل

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	$fc = C = 3 \times 10^8 = 64.79 \times 10^8$
	$fc = c = 3 \times 10^8 = 64.79 \times 10^8$ $7c = 0.004635 \times 10 = 6 \text{ GTHZ}$
s)	TEIL mode
_ 11 P	$\lambda c = \frac{2ab}{\sqrt{a^2 + b^2}}$
	$\sqrt{d_c + p_c}$
	no lost
	= 2± 5
	√6.25+1 3000 N 10 Con 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	= 1.85 cm
	no > no it is not possible
	130 730 11 15 1101 20051010
Ex:-	A Rectangular cooneguide have dimension 4 x 3 cm2
	fo = 5 (TH7 culculate all possible mode & For
	those mode conculate ng do fc
\rightarrow	70 = C 3141231 24 30 1 1 1
	$\frac{2 \times 10^8 \text{ m}}{10^8 \text{ m}} = \frac{3 \times 10^8 \text{ m}}{10^8 \text{ m}$
<u> </u>	
/ 32 / 2	ya of babiles' positioned to the second
1>	for Telo modestes to free the great
	7c= eq =
	= 2X4
	= 8cm
	.06 - 10 9hnm 0111 501.
	7c<#70
	(0151-

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	$\frac{\partial a}{\partial x} = \frac{\partial a}{\partial x} = $
	$= 0.06 = \frac{8 \times 10^{8}}{8 \times 10^{2}}$ $= 0.06 = \frac{8 \times 10^{8}}{8 \times 10^{2}}$
	= 9.07 cm
(3	$\frac{1000 \text{ TEII} \text{ mode}}{\sqrt{9^2 + b^2}}$
2 arc	The adjacent $\frac{2 \times 4 \times 3}{6 + 9}$ abundance of the $\frac{6 \times 4 \times 3}{6 + 9}$ and $\frac{6 \times 4 \times 3}{6 \times 9}$ and $\frac{6 \times 4 \times 3}{6 \times$
Fx	For The mode propagater in rectangular actions of traveling detector the distance bet m
	muximu 89 minimu founded to be 4.55cm And the frequiry of waveguide. CI=6, b=4 mode= TEID
	for TEIO mode Ic = 20 = 2x6 = 12 cm

	Page: Date: / /	9
	Street and a color	
	muxima, minima = 79	
	4.0.0	m =
	4.55= 79	7
	4 see shoot out to	
	79 = 18, 8cm	
	85 × 8115 = 3 ×	
	79 = 70	
	$\sqrt{1-\left(\frac{\gamma_0}{2}\right)^2}$	
	SWX B.S X \ =	
	$ng^2 = no^2$	
-	1-(70)	
	MATRICAL MET THE DOLLARS DAY	
	$70 = 79 \left(\sqrt{1 - (70)^2} \right)$	
	$(\gamma_0)^2 = 1 - (\gamma_0)^2$	
	(ng) (nc)	
	5(780.5) -1	
	No € = 1 - (No) €	
	(18.8)2	
	2	
	762 = 331,24 - 2,3702 = 3	
	581	
	3,37,0 = 581,64	
	70 = 10cm	
	too Ten mode	
•	(-fo = g CTHZ	
Er:-	The dimension of maveguide are 2.5 × 1002	
=	fo = 8.6 OTHZ , Ex = 3	
	1) find possible modes x x 8 9 x 9	10.
	e> cutoff freq n	
	3) મામલ , જવા દ ગામલ	

	Page	Page: Date: / /
	$70 = C = 3 \times 10^8$	
	- fo 8.6 X 10 9	(xilixon
	- 0.035 m	
	FA \$22.12	
	-) for TF10 mode	
	11112 61 = 116	
	$\lambda c = \frac{\sqrt{w_{\xi}p_{\xi} + w_{\xi}}a_{\xi}}{5ab\sqrt{\xi}x}$	
	= 2 x 2. 5 x √3 = 8.66 cm	
	= 0.086 m	
	nc> no so Teno is possible	
	フェ つ。	
	$\sqrt{1-\left(\frac{yc}{30}\right)_5}$	
	= 0.035	
	$(0.035)^2$	
	= 0.038 m	
	fc = C つC	
	= 34818B CTHZ 3,4883	
<u> </u>) for TEII mode	
-	$\gamma_c = 2ab \sqrt{\epsilon \sigma}$	
	Sun x 2.5 and \(\sigma^2 + \begin{array}{c} \cdot \cdot \end{array} \rightarrow \cdot \cdot \cdot \end{array}	mil sat to
	= 2 x 2.5 x1 x 10 \ \frac{7}{3} ==	3.21 cm
	$\frac{x^{10}}{\sqrt{(5\cdot2)_{5}}+(1)_{5}}$	1040-
	mile 9 x c w h	alley to

	Page: Date: / /	
*	nc < no so TEII mode is not possible	
ET	नि हर्गियानुपायक काव्यरहुपाँतिर have dimension 4 x 3 cm² fo = 5 धामट calculate cui possible mode lo those mode calculate ng lo fc , Ev = 3	-
	70 = C = 6 cm -fo	
	for TF10 mode	
	= 13.82 cm	
	fo = c	
	$\frac{\sqrt{1-(6)^2}}{(13.85)^2} = \frac{3\times10^8}{13.85\times10^2}$	
	= 6.65 cm = 2.16 (π.Hz	
	79 = 0.0665 m	
-	for TEII mode.	
-	$\gamma_{c} = \frac{2ab\sqrt{\epsilon}\sigma}{m^{2}b^{2} + n^{2}u^{2}}$	
	$= 2 \times 4 \times 3 \times \sqrt{3}$ $= \sqrt{(4)^2 + (3)^2}$	·
	= 8.31 cm	

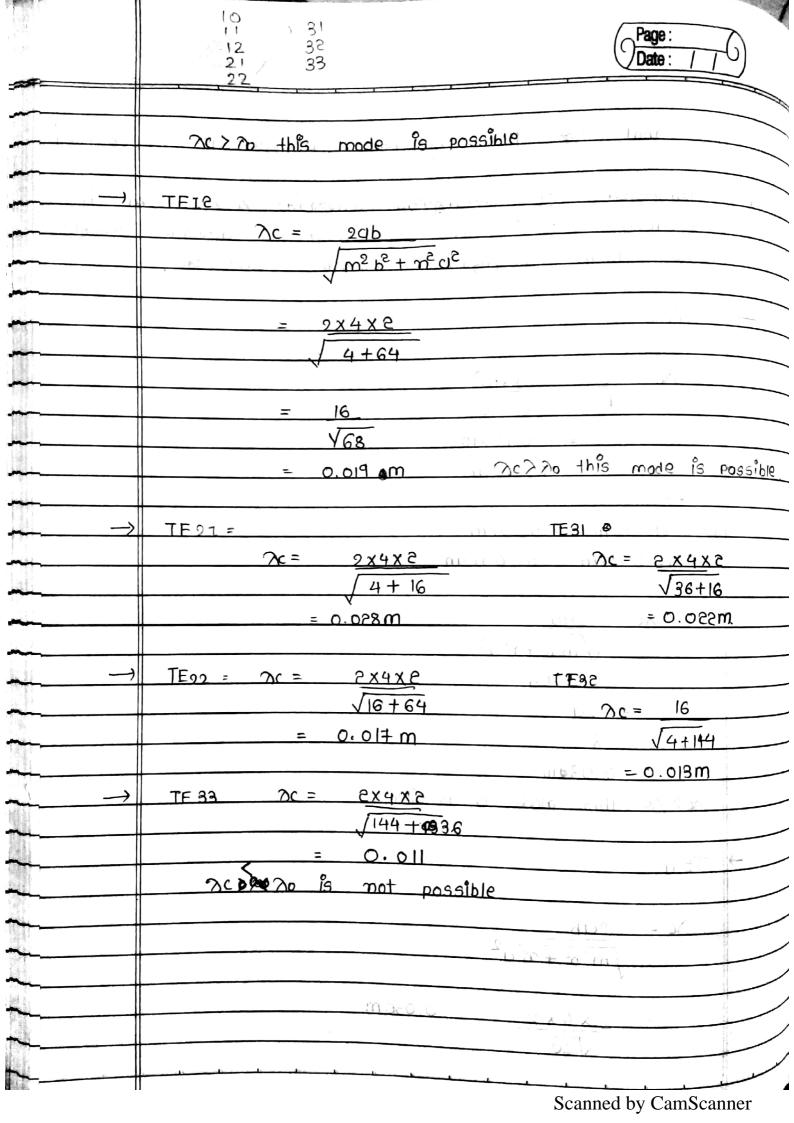
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	De se man a se
	$\frac{\sqrt{1-\left(\frac{\gamma_0}{\gamma_0}\right)^2}}{\sqrt{2}}$
Enn	Fry makes only aver application polymental a se
tent at	show although the statement sup a sof
	$\sqrt{1 - \left(\frac{6}{8.31}\right)^2}$
	Y (8.31)
	= 8.66 cm
	= 0.0866 cm
	$fc = C = 3 \times 10^8 \text{ and } od$
	$\lambda c \qquad 8.3 \times 10^{5}$
	= 3.61 CHZ
	ma 22 F1 =
	for TF12 mode
	o/ = P/
	$3c = \frac{2ab}{\sqrt{\epsilon}\sigma} \sqrt{\epsilon}\sigma$
200	$\sqrt{m_b^2 + m_b^2 a_b}$
200	$= 2 \times 4 \times 3 \times \sqrt{3}$
	√ 16 9 + 64
7 11	- 6 65 cm
	= 41.56 m > 2200 = 16
	√ 13
	= 4,86 cm
	Not not possible (TE12)
.1/	on dus = m
*	Circular conveguide! - for dominal mode is
	TFIL Mode
	DC - OTTE
	$7c = 2\pi 8$ 1.841
	ma 16-8

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	6 ~	for radius of 2 cm of recipies coaves	quide
	<u>ex</u>	operating do dominal mode coooking cit	
		OF foegn calculate cut-OFF coavelength	
		couverength, guided velocity, phase Velocity	
		wavelength, galaca velocity, phose velocity	. 7481 - 0
		2	
		$\Delta c = e\pi x$	
		1.841	_
	(M.)	Thouseless of convenience in x ms == 1 from	91100000
	403	("s-6) romana 1.841scv of addisens ed ti	
		= 0.068 m	
	4	TO ME TO SHOOT OF MEO. OF SECURITY OF THE PROPERTY OF THE PROP	
		max = h	
		$\gamma_0 = c$	
		fo (10.0)	
		= 3 x 10 %	
		OIXP TO POIXP	1077
		= 0.033 m	2.32
		501xF = 310.D x 115 =	
		COINING = NO 1781	
		2 0.051m 2 (0C)-1 v 0.3m	
3) ne)	
		= 0.033 isage tom A 1 36 < 36	-
		(1-(0.033) ²	
		(FO.O)	10 10
		= 0.037 m	
		OT SET IN	
		VP = C	
		1-(no)2	T Vas a
		(70)	
		$1.48 = (=6.3 \times 10^8 \text{ m/s})$	
	0.	2000年10日	
		$\sqrt{1-\left(\frac{0.033}{0.07}\right)^2}$	
		y of of tour hat	
	2.3	f grant satures, ad number and of or	
à			1

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	Ebluc	NE NO = CS
	544	no politico appei locaren en portunaren
	hahfur	(9) (1)
		tholes and 3,40 x 1081) alone has less digresses
		= 2.64 × 108 m/s
	<u>Ex</u>	if Diameter of maveguide is 3 cm them com
سعر		It be possible to use operating forgin of
		J CπHZ ?
		if keen m what use the possible solution.
سسس		d = 3cm
		δ= 1.5cm
-		= 0.015em
		2017
		$\frac{\partial e}{\partial x} = \frac{\partial \pi}{\partial x} \qquad \frac{\partial \pi}{\partial x} = \frac{\partial \pi}{\partial x} \qquad $
		= 2TI X 0.015 = 3X 10 ⁸ 1.841
		= 0.051m = 0.3m
		λο > λc it is not possible o
		CHED. DOLLA
ك.	2>	Ex = 36
<u></u>		$= \left(\frac{\gamma_0}{\gamma_c}\right)^2 - \text{ Dielectair constant}$ (Ev)
4	38	$86 = 2(0.3)^2$
		0.051)
-		= 34.6
~		To have $\eta_c > \eta_0$, present $(\eta_0)^2 = 34.60$
10 m		20
	1	that equal to Ex 50 Ex Value should be greater than 34.6

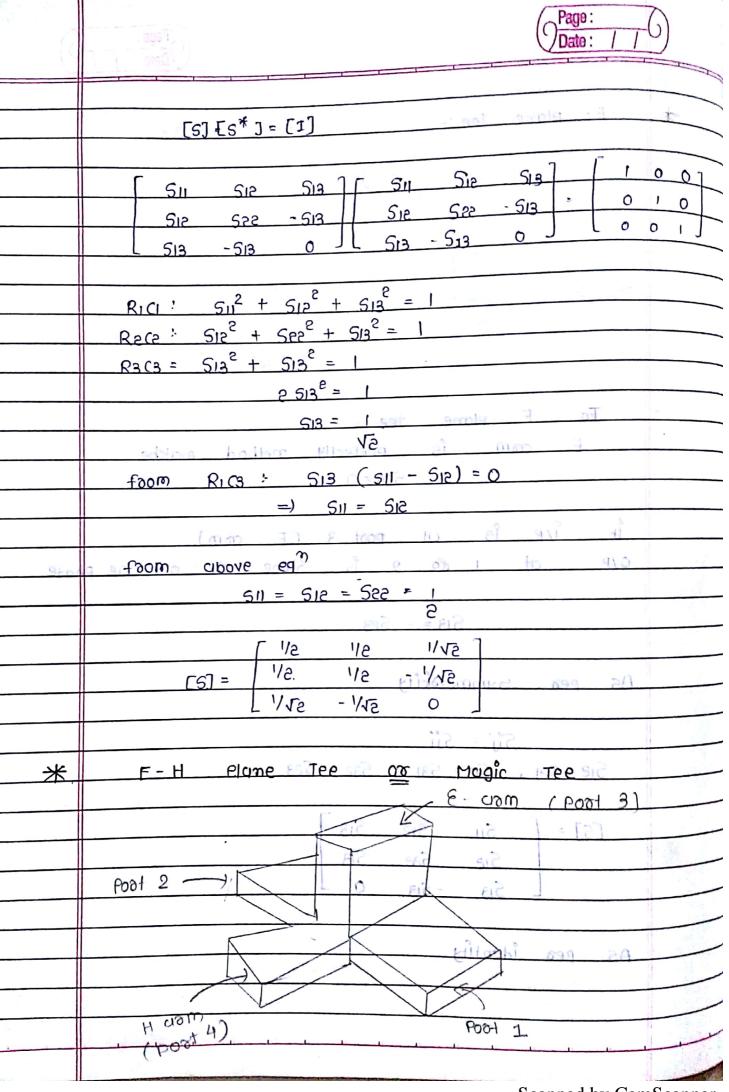
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	So that me this conveguide Operate at Ja	n TH7 freq
ξχ	Dimension of rectangular waveguide 4 x 2 C	m ^e if
	Operating they is so onthe calculate	possible
	mode from propagate through cociveguide	
		1
\rightarrow	TFIO	.) !!
	Eat B	1
	$\frac{1}{2} \frac{1}{2} \frac{1}$	
	f soxiog	1
	= 0.15 X10 6.14	1.
	= 0.015 m	
	e) U= 4cm b = 2cm	(
	Q= 0.04m b= 0.02m	
	11+16V 201- 20h	
	$\sqrt{m^2 k^2 + n^2 u^2}$	
	= 2×0:04 5×4×5 = x	(
	01 -= C2Q Pa+al	
	$P(1) = 8 \qquad m + 10.0 =$	
	milo 0 = 0.08@m - milos 1 = 1	,
	nc>no this mode is possible > - > FE T	· Comme
	ीमम मुक्का उठ	
	TE11 10.0 =	100
	Stateson ton at or says	1334
	$\gamma_c = 2ab$	
	$\sqrt{m^2 b^2 + m^2 a^2}$	
	Y	
	$= 9 \times 4 \times 2 = 0.036 \mathrm{m}$	
	V20	
		h - 73



*	H plane Tee 3-
£	
	POOT 2>
	1 Post
	7
	Poot - 3 (H-UVM)
	Szi Sze Sez
	<u> </u>
-	Poat - 3 is perfectly mutched
	533 = 0
	District Signature
_	poat - 1 do 2 ciare inphase with poat 3 with
	Same Magnitude
	513 = 523
	315 - 363
	it follows Symetalcity
	Sij = Sij ·
	LV'
	Sie = Sei , Sia = Sai , Sea = Saa
-	Identity
	Toc unit
	Γ-1 Γ-# 1 - Γ-1
	[s] [s*] = [I]

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en e	- 90 and 11 11/2	1
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1//////////////////////////////////////
	RIC3	
3 t i (a.)	511 = -Sie 36000000 30000000 30000000000000000000	
	Su = 1/2	
200	Sie = - 1/2 Ministerna 2000 ti	
	$[5] = \begin{bmatrix} 1/2 & -1/2 & 1/\sqrt{2} \\ -1/2 & 1/2 & 1/\sqrt{2} \end{bmatrix}$ $-1/2 & 1/\sqrt{2} & 1/\sqrt{2} \\ -1/\sqrt{2} & 1/\sqrt{2} & 0 \end{bmatrix}$	
	Thenhity -	

	Page:
*	E- Plane Tee:- B Aam (Pool 8)
0 1	Poat 2 —)
-	To F plane tee F com is perfectly method matche
-	if i/P is cit post-3 (F com) O/P at 1 60 9 is Same and out of phase
-	S13 = - Se3 As per Symmetakity
	ร์บ = รบ่ ราย = รอบ ภาราช = รอบ ค.ศ. ราย = รอบ ค.ศ. ราย
	$\begin{bmatrix} S \end{bmatrix} = \begin{bmatrix} S_{11} & S_{12} & S_{13} \\ S_{16} & S_{26} & S_{13} \\ S_{13} & -S_{13} & G \end{bmatrix}$
•	As per identity



	Page: Date: / /
-	Here F com & H com in magic tee is
	So.
	533 & 544 = 0 , 533 = 544 = 0
	1510 PIC 110 MP] PIC 110 MI 110 M
_	post 3 & post 4 is issoluted to each other
	Here E com do H com is perfectly isoluted
	to each other
	534 = 543 = 0
	,
	if i/p is given to post 3 (F clam)
<u> </u>	O/P at Post 1 do 2 is will be some &
	out of phase
	Cro Coo
	513 = 523 Total Tipe 1013
-	IF I/P is given to post 4 (H com)
-	0/P at post 1 de 2 millable same de in Phase
	1 5 813
	Si4 = Se4
	Kara Dia 1
-	Symmetaicity paopeaty
	Sij = Sij
	0 355 + SIG - 50 64
	Sie = Sei, See = See, 534 = 543
	531 = 513 , 524 = 542 514= 541
4	[5]= โรแ - รเอ - รเอ - รเน] .
	SIR SRR - SI3 514
	513 - 513 0 0
	514 SIH 0 0

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	identity property man
	[s] [s*] [s]
balo	SII SIE SIB SIU SIE SIB SIU SIE SIB SIU SIE SIB SIU SIB SIU SIB SIU SIB SIU SIB SIU SIB SIU SIU
•2	
	$R_{1}C_{1} \stackrel{.}{\Leftarrow} = S_{11}^{2} + S_{12}^{2} + S_{13}^{2} + S_{14}^{2} = I$ $R_{2}C_{2} \stackrel{.}{\Rightarrow} = S_{12}^{2} + S_{22}^{2} + S_{13}^{2} + S_{14}^{2} = I$ $R_{3}C_{3} \stackrel{.}{\Leftarrow} = S_{13}^{2} + S_{13}^{2} \stackrel{.}{\Rightarrow} I$
320	S13 = 1 V2
	R464: $514^{9} + 514^{9} = 1$ $514 = 1 $
~	$\therefore \text{ Re } \text{ Ce} = 51\text{ e}^2 + 5\text{ e}^2 = 0$
	Rici = Sile + Sie = Opso Fiz 150
	Sii = Sie = Sie = Oii

	Page: Date: / /	<u>-G</u>)
	[S] = 0 0 1/VE 1/VE 7/VE 1/VE 1/VE 1/VE 1/VE 1/VE 1/VE 1/VE 1	4
	L'We 'We o o	1
* 	Directional Coupler:	
por cate	(Pi) input Post Output on	
1	back Foot Foot Foot forward	
	(Pb) (Pf)	
\rightarrow		
	$C = 10 109 \left(\begin{array}{c} P_1^{\circ} \\ P_F \end{array}\right) \left(\begin{array}{c} 1 \\ 1 \end{array}\right) = \begin{bmatrix} 1 \\ 2 \\ 3 \end{array}\right) = \begin{bmatrix} 1 \\ 2 \\ 3 \end{array}$	
<u>→</u>	Diaectivity 1 = 662 + 662 (= 058)	
	D=10=10g (PF) 1=1000 + 5000 (PB)	
\rightarrow	isolation tactos	
	$T = 10 109 \left(\frac{p!}{Pb}\right)$	
\rightarrow	All posts one signatched i post	
	SII = 522 = 583 = 5440= 0	

	Page: Date: / /	-6)
_	ideally back pomer should be zero	
	531 = 0, 0542 = 0)	
	351 37 37 37	
-	As per Symmetaicity	
	Walst Car Burgar and	7
	Sii = Sii	
•		
-	512 = Se1, S13 = S31, S14 = S41, Se3 = S32, Se4 = S42	, 534 = Sua
•		
	0 SIR 0 SI4	
•	$S = S_{12} O S_{23} O$	
	O 523 6 584	T.
	514 0 S34 0	
\rightarrow	AS per identity property and partition	5
	[c] ro* 7 - 7	
	[5][5*]= [I] (17) LOL 01 = 7	
	$R_1C_1 \Rightarrow S_{12}^2 + S_{14}^2 = 1 7 \rightarrow S_{22} = S_{11}$	1
	0-6 2 2 319	
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	+-
	Chrom of the section	
(R4(4) - 514 + 534 = 1	
	foom (1) & (4)	
	$C_{12} = C_{24}$	
	issiation iadas (5.55 - 3.55 -	1
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4	5= 512 0 514 0	
	O to SIM to Otoo SIP and the	
	SI4 U OPER SIE O	4-
		-

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	Received Position 512 = P	
	fooward (coupled) 514 = @ 9	
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	O G O P	
	gro of bassas miles gift atomosis	
*	isolutor :-	
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6	god to 910 godt r rong to gravite at 91%	
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	Resistive (and	
	45 toist Resistive	
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	Regord Line Poot H	
250	to poot	
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opich	anticolor and a large and the	
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	(TEIO) (TEIO)	
(1)	teint 20 Fedding boo feddile dodget.	
165	ricerolise disenton makes it to vest	
esfative	a bay and walls of light a lines basicalor	
971		
	AS / O/P	
		lili on the
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	(Clod Sod Resignive	and the
	લ્ય સ્વે.	1

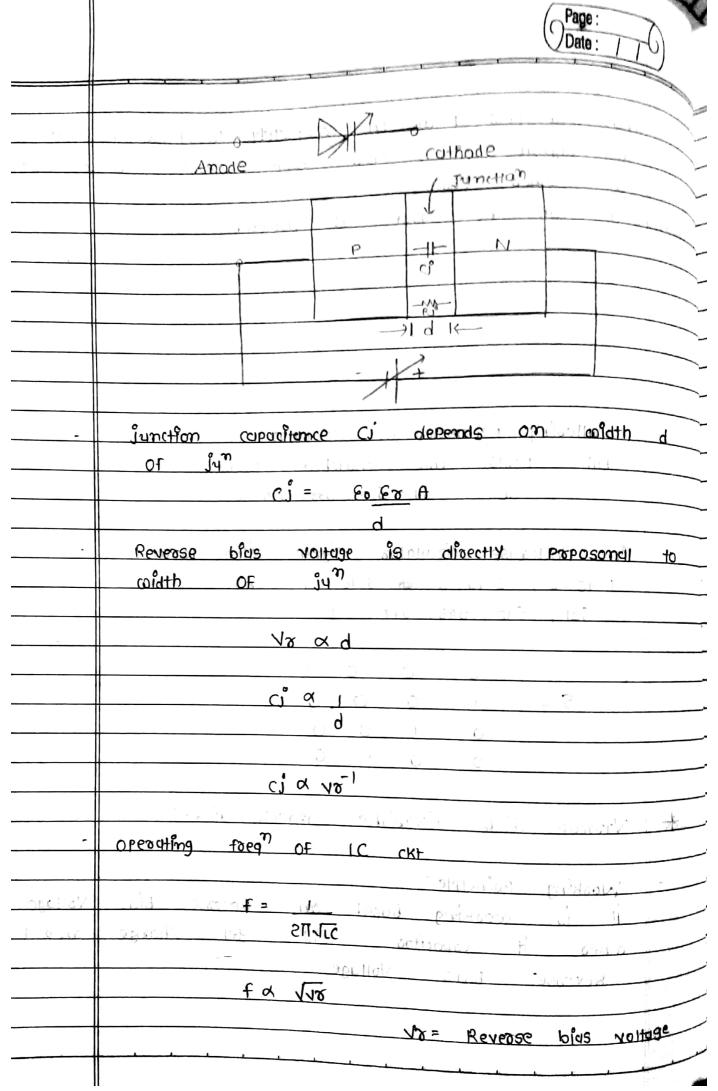
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	forms to a format format	
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	1545° 107E	
	G (Resistive 7 Tood	
	(cood) (Fro . Respanse	
	E cyad.	
	- 0 0 0	
	isolator is a device which is been used to	0
	isolute I/P with respect to O/P	
	oespect to actional	*
	Wooking:-	
	9.0 0	at 2
	is similar to ile at boot I but	
		OP crib
	Poot 1 % 7000	
-	if is given at poot 1 with Jein	mode
	If could be Veotically polonized signal	
·	50 Hodizontally polodized Resistive and all	lama
	Ventically pologized signal to puss through at	them
	This signal goes to 45 Amiliciockwise twister	00480L
	makes Signal to get collented 45° to the	เทาเรีย
	(भिष्यापाला ,	
	then again fessit sod makes 450 twist	ຳກ
	Clockapise diaection makes it to	
	partition to the state and	0 -0 19.10
	cood at post 2 d O/P Ps Similar to	irp
		11.7
		- Leg
`		
suite.		11 4 3 3 4 3 1

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	if is given cit poot 2 with TEID mode which
	95 Veathally poloaizes signal this signal cilloco
adits	pass through resistive and at post 2 than
	Signal is get twisted due to fessit and in
	45° clackwise. In cyalin it is getting toolisted.
	by twisted in 45° clackwise which makes
	that Signal Osintation hosizontal Polosized signal
	which is getting absorb at Resistive and
	pluced cit post I so 0/p the post I is
	ത്തിന്വത
_	Scattening mutaix:
	SII SIE
	5 = 521 522
	[O 1] POST I & POST 2 is PROFECTLY
	= 0 0) mutched
	So su = See = 0
	i/P at post I seaches the O/P at Post 2
	but at 1/P Post 9 not seaches to at 0/P
	aton poot 1020 to location toward to
	Tector gulas shirterma solutions a
no and	Court Court O and the most most
Dinber	hatcakam a short shippayom
4	Clacalatox/ 2-
T	(18 cylutor) o device where wasignal is getting
	- do
of sar	either life clock colse on Anti Eclock wise
was steam	either selection clocks colse to the problem
10	Andisection (coto) theripies of the grantes
4	

here gif i/p is post 1 them O/p oill be post 2 cmd other post oill be zero Similarly for Other Post Signal is getting Xiered to next successive post Post 2 Post 3 Post 1 Post 3 Post 2 Post 3 Post 3 Post 1 If we insect signal at post 1 for acceptance of them of the control of the	i	
be post 9 and other post will be zero Similarly for Other Post Signal is getting Xiered to next successive post Post 2 Post 3 Post 1 Post 4 Post 3 Post 3 Post 1 Feesive road If we insert Signal at post 1 Rectangular moveguide dominal mode is Tell Noon them that Signal is xier to cylindaled maveguide mode is convented train Tell to		
be post 9 and other post will be zero Similarly for Other Post Signal is getting Xiered to next successive post Post 2 Post 3 Post 1 Post 4 Post 3 Post 3 Post 1 Feesive road If we insert Signal at post 1 Rectangular moveguide dominal mode is Tell Noon them that Signal is xier to cylindaled maveguide mode is convented train Tell to		here a if i/p is post 1 than O/p will
Similary for Other Post Signal is getting X'ferred to next Successive post Post 2 Post 2 Post 3 Post 1 Post 4 Post 3 Post 2 Post 3 Post 4 Post 1 If we insert Signal at post 1 foot Sectongular moneguide dominal mode is Tele Now them that Signal is x'rea to cylindaled maneguide mode is convented taom Tele to Tell mode		be post 2 and other post will be zero
Post 4 Post 3 Post 4 Post 3 Post 4 Post 3 Post 4 Post 3 Fost 1 Fost 2 Post 3 Fost 3 Fost 3 Fost 4 Fost 5 Fost 4 Fost 5 Fost 4 Fost 6 Fost 4 Fost 6 Fost 4 Fost 6 Fost 4 Fost 6 Fost 6 Fost 7 Fost 7 Fost 7 Fost 7 Fost 7 Fost 8 Fost 1 Fost 7 Fost 7 Fost 8 Fost 1 Fost 7 Fost 7 Fost 7 Fost 7 Fost 7 Fost 7 Fost 8 Fost 1 Fost 7 Fost 7 Fost 7 Fost 7 Fost 7 Fost 7 Fost 8 Fost 8 Fost 9 Fost 4 Fost 7 Fost 7 Fost 7 Fost 7 Fost 8 Fost 9 Fost 4 Fost 7 Fost 7 Fost 7 Fost 7 Fost 7 Fost 8 Fost 9 Fost 4 Fost 7 Fost 7 Fost 7 Fost 7 Fost 7 Fost 8 Fost 8 Fost 9 Fost 9		Similarly for other post Signal is getting
Foot 2 Foot 3 Foot 4 Foot 2 Foot 3 Foot 4 Foot 2 Foot 3 Foot 4 Foot 2 Foot 3 Foot 4 Foot 2 Foot 3 Foot 3 Foot 3 Foot 4 Foot 2 Foot 3 Foot 3 Foot 3 Foot 4 Foot 3 Foot 4 Foot 3 Foot 4 Foot 2 Foot 2 Foot 3 Foot 4 Foot 4 Foot 3 Foot 4 Foot 4 Foot 3 Foot 4 Foot 4 Foot 5 Foot 4 Foot 4 Foot 5 Foot 6 Foot 7 Foot 9 Foot 9		
Foot 4 Foot 3 Foot 1 Foot 2 Foot 3 Foot 1 Foot 2 (TF:0) Foot 4 Foot 5 Foot 6 Foot 6 Foot 7 Foot 6 Foot 7 Foot 7 Foot 7 Foot 6 Foot 7 Foot 7		,
Foot 4 Foot 3 Foot 1 Foot 2 Foot 3 Foot 1 Foot 2 (TF:0) Foot 4 Foot 5 Foot 6 Foot 6 Foot 7 Foot 6 Foot 7 Foot 7 Foot 7 Foot 6 Foot 7 Foot 7		Hur ting interpretation of assist the
Foot 4 Foot 3 Foot 1 Foot 2 (TF:0) Foot 2 Foot 4 Foot 4 Foot 4 Foot 4 Foot 4 Foot 5 Foot 2 Foot 6 Foot 7 Foot 7 Foot 9 Foot 1 Foot 7 Foot 9 Foot 4 Foot 6 Foot 7 Foot 9 Foot 1 Foot 7 Foot 9 Foot 4 Foot 1 Foot 7 Foot 9 Foot 4 Foot 1 Foot 7 Foot 9 Foot 1 Foot 7 Foot 9 Foot 1 Foot 7 Foot 9 Foot 1 Foot 9 Foot 9		Les and the second of the seco
Foot 4 Foot 3 Foot 1 Foot 2 (TEI) Foot 2 (TEI) Foot 2 Foot 4 Foot 5 Foot 2 Foot 4 Foot 6 Foot 6 Foot 6 Foot 7 Foot 7 Foot 7 Foot 7 Foot 8 Foot 1 Foot 7 Foot 8 Foot 1 Foot 7 Foot 9 Foot 4 Foot 1 Foot 7 Foot 9 Foot 4 Foot 1 Foot 7 Foot 9 Foot 1 Foot 7 Foot 9 Foot 1 Foot 7 Foot 9 Foot 1 Foot 9 Foot 1 Foot 9 Foot 1 Foot 9 Foot 2 Foot 9 Foot 4 Foot 9 Foot 1 Foot 9		Post 1
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Foot 3 Foot 1 Foot 2 (TF:0) Foot 2 (TF:0) Foot 2 Foot 3 Foot 4 Foot 4 Foot 3 Foot 4 Foot 4		
if we insert signal at post-1 for rectangular moveguide dominal mode is The Now them that signal is xirer to cuincialal maveguide mode is converted transmitted.		POOT 4 POOT 3
fessive sod Post-4 if we insect signal at post-1 foot aectangulus maneguide dominal made is Tru Now then that signal is x'res to autimated maneguide made is convented from Tru to Tru made.		· idita (signita) -
fessive sod Post-4 if we insect signal at post-1 foot aectangulus maneguide dominal made is Tru Now then that signal is x'res to autimated maneguide made is convented from Tru to Tru made.		
fevoire rod fevoi		45°
if we insert signal at post-1 for acctangular maveguide dominal mode is TF10 Now them that signal is xiew to culindated maveguide mode is converted to maveguide.		
if we insert signal at post-1 for rectangular maneguide dominal mode is The Now them that Signal is x-ter to alimbolical maneguide mode is converted transmitted. The made.		Port 1 Port 2
if we insert signal at post-I for rectangular moveguide dominal mode is The Now than that signal is x-res to outsidated as a veguide mode is converted to mode.	PHOSIO	(TEID)
if we insert signal at post-I for rectangular moveguide dominal mode is The Now than that signal is x-res to outsidated as a veguide mode is converted to mode.		
if we insert signal at post-I for rectangular moveguide dominal mode is The Now than that signal is x-res to outsidated as a veguide mode is converted to mode.		
if we insert signal at post-I for rectangular moveguide dominal mode is The Now than that signal is x-res to outsidated as a veguide mode is converted to mode.		
if we insert signal at post-I for rectangular moveguide dominal mode is The Now than that signal is x-res to outsidated as a veguide mode is converted to mode.	0	tone to the feodile and ton Poot - 4
now then that Signal is xies to cylindalcul mode is converted toom Telo to Tell mode.		U1 118 96 139 6 1991 11 10 14d 8
now then that Signal is xies to cylindalcul mode is converted toom Telo to Tell mode.		if we insert signal at post-129 for
Now then that Signal is xies to cylindalical convented toom TEID to TEIL mode.		rectangulus maveguide dominal mode is Tem
TFII made.		Now then that Signal is xired to alimbrical
TFII mode.		coaveguide mode is convented toom This to
Now signal as getting oriented as From mittig		
50 TO TO THE TOTAL THE TOTAL TO THE TOTAL TOTAL TO THE TO	1.71	Now wigner and getting continued to
Position by female a god and is	16,12	position by femate and as is most of phase to
post +3 loca continue continue of the phose to		post + 3 co ogamo conti clockwise on 45° traister
muking it to objection on in the		making it to original orientation out of
Uolen lation to lout of		D'olentation of out of

	duplexes it is toomsmittle to deretue the organi
	Same time de also 9soiate the Signal Page:
	Date:
*	
	phase to post -4 do in completely in phase to post -2
	So signal can x'tea from pool 1 to 2 not
	to Other Posts
Applica-lic	po it can be used as duplexed. I signal is given at
	TX, RX Post I from vimiling
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-	it Could be made of silicon.	
-	To have 90 GHZ Vary- cap diode Challes 1	natesial
	is used (Gallium Arsenide)	
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- 11	Application.	
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	Step 4 :- identify 41	
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	step 6 - identify ye	
	Step 5 indentify 1 length Of 1 is y1 to y1 in clockwise	dipection
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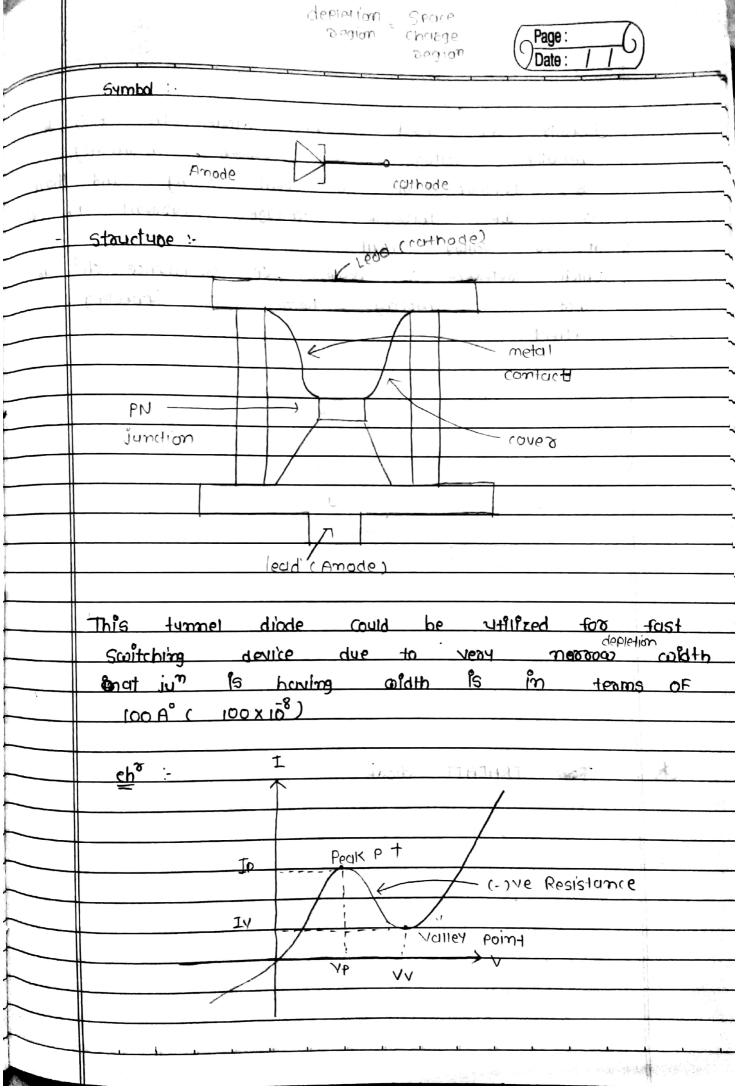
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1111	A to B exibts -ve resistance che happen boroz of -ve mobility U= 4 dud dE
3>	B to further: In this work us a forward bius alode
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		Cerame metalic wire wine (1)
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2.	1000 freq
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	Rd = diode Resistance
	LP = packet Productance
	Re = lead Resistance
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12	mo bicis :- (zero bicis) :- in that P type
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	but I- layer contain exterme high resistance
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	N is connected to -ve teaminal of battery
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	& N is the teaminal of battery conich
	leads to increasing depletion region & A
	that offers extermilly high resistance.
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	metal contect

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	Application wire galaction 35 aro 699001
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*	Tunel Diode -
-	it is extramully hevily doped diade 6
-	doping concentraution is in team of
-	103 PPM (Publs Per milion)
	material used to febricate turnel diade
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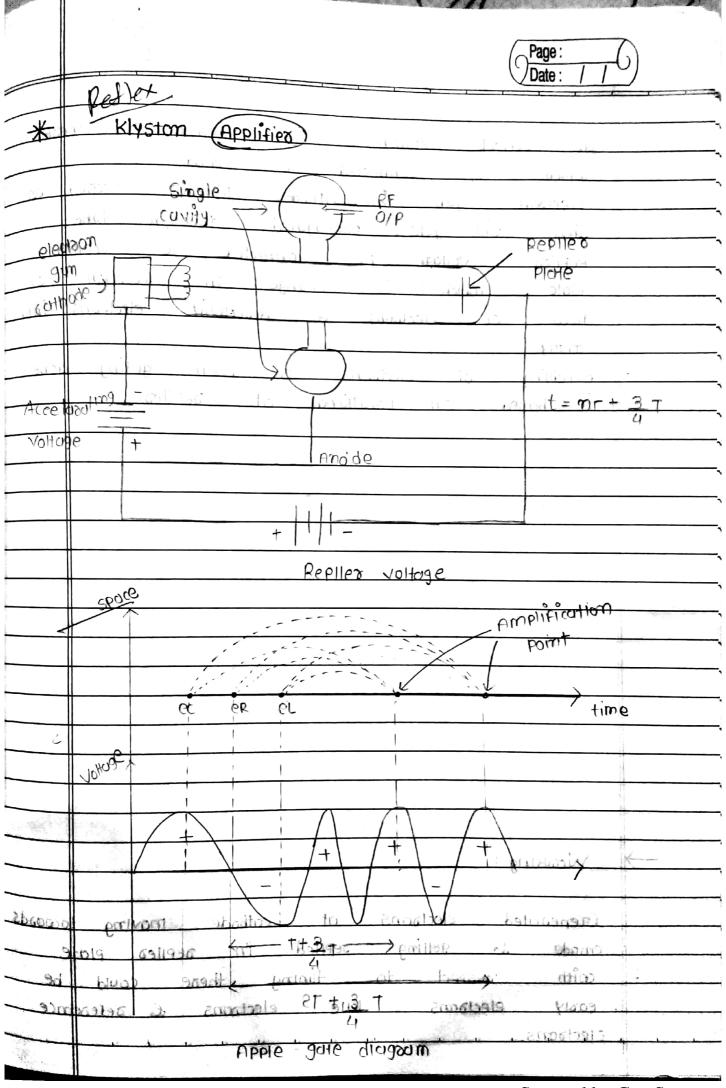
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Advantage: 10 Operate it at high power where some application like radar & newligational application with a period of the state of the	- 8	This diade is having high Switching Speed &	
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(de she amily transcenses (1B)		(which amily timescenes (16)	-
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			-
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Page: for forward blas it starts to conduct cifler Vollage Voltage greater than potential burgier and in Revease bias it flow minos avagent due to space charge begion after chalanch breakdown high cyrrent following due to multiplication of charge carrier even called as avalant in charge multiplication. Busically imputt diade is use in R.B & blusing 00 Operating point is their verge Of avalanch Break-down This diade does not operate on DC the reason is tit's che is similar to mormal P-N Jum diode but to operate in Ac we upply hiusing R.B on the verge of Breakdown NT 960mA Space नाहत Dairt chasse Degion <u>रु ह्यांठ्य</u> region Tichunge - Holesme electoons Q316Q rassies > dist y

	Page: Date: / /
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	After breakdown flow of charge carrier cun
194	be seen in diagram resulting in current by 90° with
i iii	& here current is lake by 90° with respect to Voltage
	O CSPECT 10 VOITINGE
	here we can observe when voltage increase
	cuppent is not that but other Voltage
	V cympent is 1 so Small span of
6	that time penied it exibits -ve resistance
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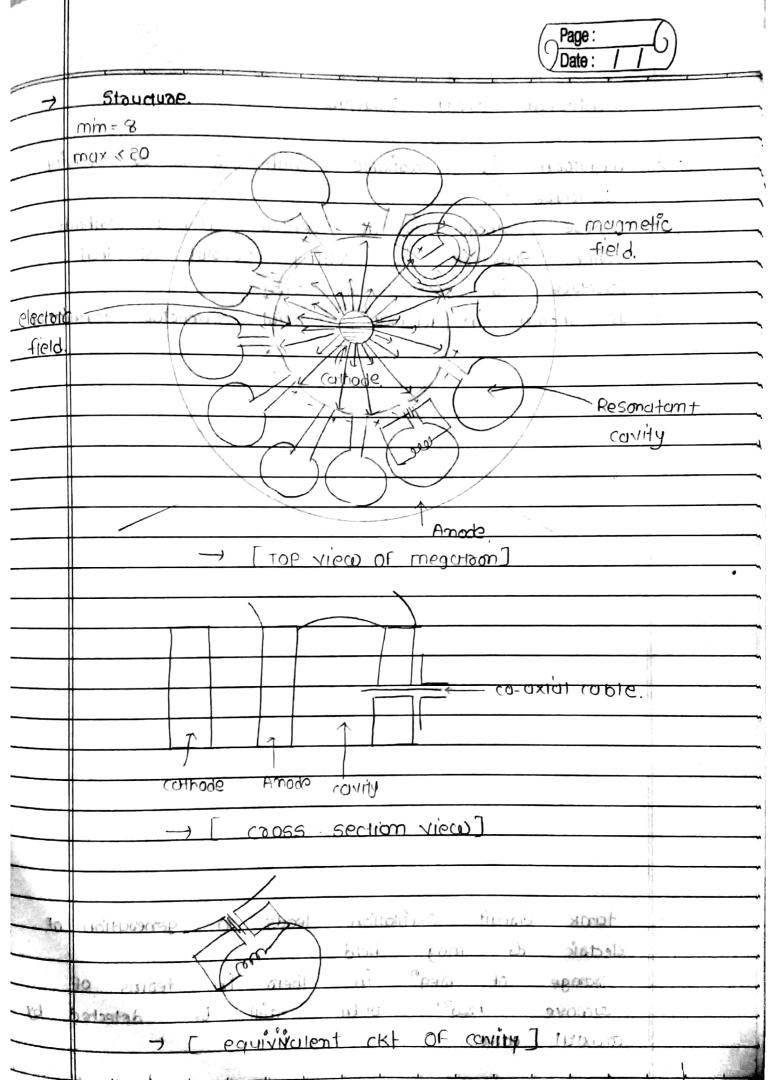
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	In aeflect klyston single cavity is there
-	Which is connected to anode
	electron gun in cathode) generat electron do
	that will gate, propagated through tube
	Depllor unitage is connected to depiler
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	flow of electrons & directivity electrons into
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	e rectaons.
10	

Page : Date : To combine all together are need higher velocity in with late electron & lower velocity with early election is called as velocity modulation which is been based on apples potentional e more of operation Transiance time T for banching of electrons is be defined by Application It can be used as a Oscillator Or amplifier Two cavity klystone Ampliting. * Amod e Bynche doift space To Collector items

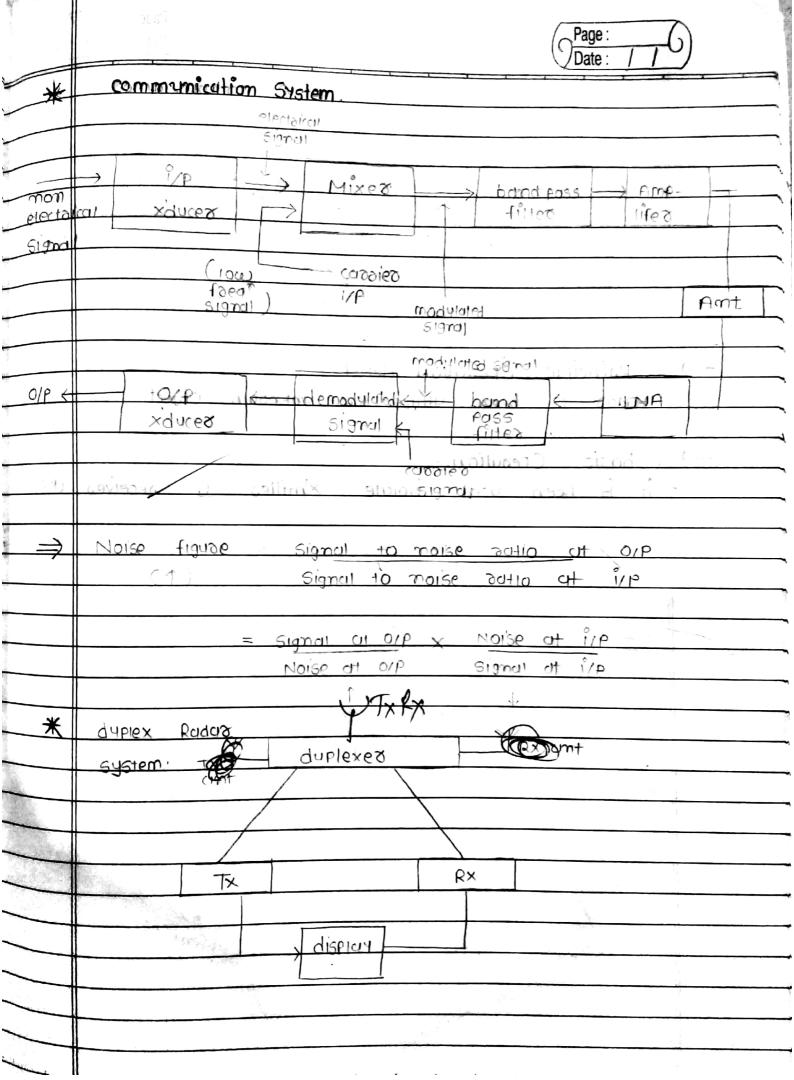
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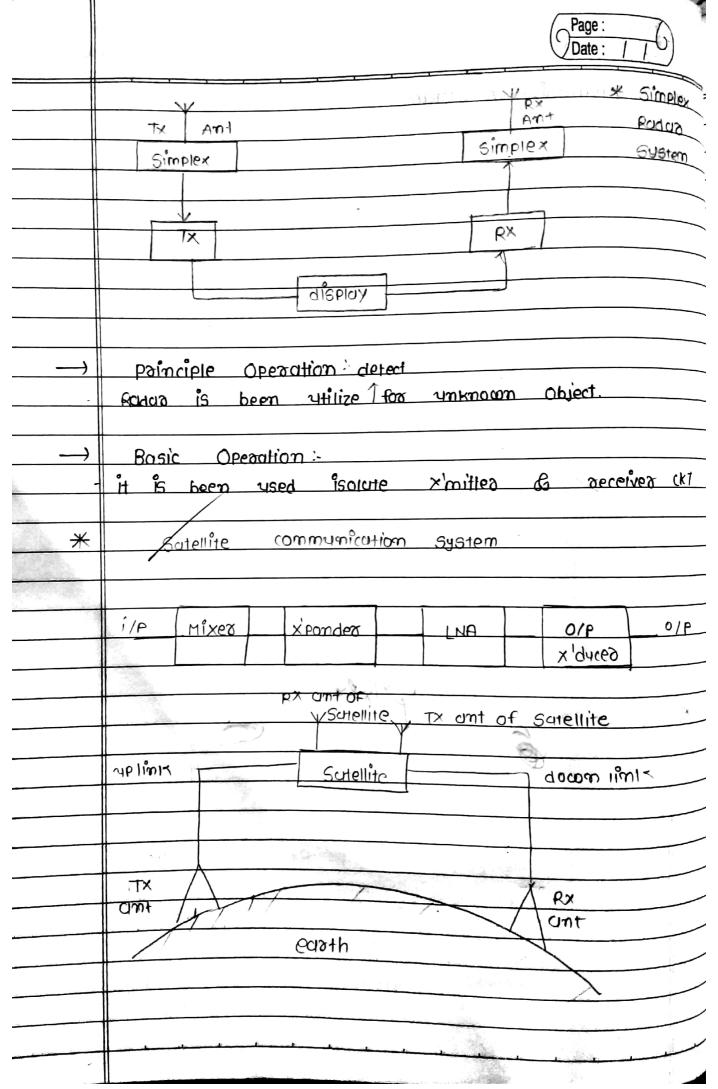
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ن جن ندرا	anade le dusing the motion by	retocity
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	132 1. An (812 A)	-
	and to receive at same time easy elected	me Should
	have low velocity & late electrophe st	
ij	heigher velocity this phenomena is called	
V	volacity modulation wise 2 mm a should	
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	i parlación.
- 10000 -	multi cavity kluston electroon emitted by electroon gun
4 4 12 11	& those electrones received at anode the
	reason is anode is connected the so cathode
	is connected -ve teaming) of battery
b9106	m-1 cavity so bynches cavity a cohese comet
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	RF complified OP
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- 31 M - 1	Wooking the sin of the wall and
- É4	generated electrones from electron gum move
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	Velocity modulotion electrones are
	& collected at Nth accretity
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*	Megatam Oscillation: Magnetaon
\rightarrow	Wooking painciple:
	it is been utilize to generate to Oscillation of
	unove freq"
-	Jonging from 600 NHZ to 300 CHZ
	SWO UIRZ
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	integral cavity Staucture
\rightarrow	megatorn is crailable coith 8 to 20 cavity Stouglabe
-	county Staucture is getting revoled at that
	Stauctube is noted at conde. as shown in fig from co-curial connected connected
-	mag flets
-	mag tro
	field - +
	Resonatum Covity
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-	Anode
-	tunk circuit Oscillation leads to generation of electric & mag field
	sange of freque in their for teams of sumave freque will be detected by country cable.
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·	in figure we show that the non electrical signal x'mit to x'mitter antenna
	using Xmitles ant Signal Xmit earth to satellite
	Mixeo Pagress cm i/P signal do capaleo i/P
-	tacms mitted ant of satellite x'mit ant to earth as at earth station received ant receive
	the Signal
3/2	riplink forged is higher than the downlink forg
*	Microcouve imaging la il's application
	And the transfer of the constant to the constant of the consta

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*	Alds Of movigation:
	The composes:
	A compass is a navigational instrument that shows
	directions in a frame of reference that is
	stationary recutive to syrotace of the earth
·	it four cooding directional (North, south, east, west)
	The chaonemeter:
	a chromometer is a clock that is precise and
	accurate enough to be used as a protable
	time std. It can therefore he used to determine.
	loongstude by means of celestial marigation
	SUPER LIB
	The Sextant:
	It used to measure the angle net any two visible
4	on Objects . The same of the s
-)	The Theodolite:
24 4	med susting angles in the horizontal de vertical plumes.
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*	Novigation: The ast of directing the movements of a cirult
	Conject) from one point to another along a
	destred path ist called making attom
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	shoot & secure path to to towel
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