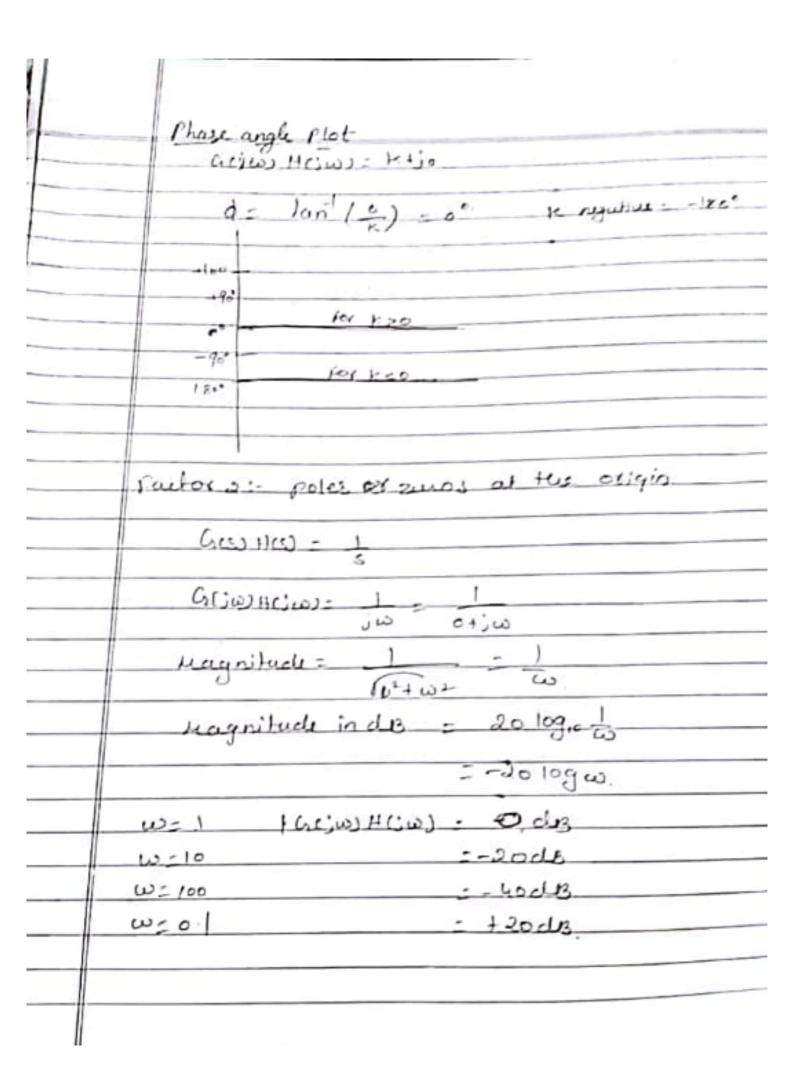
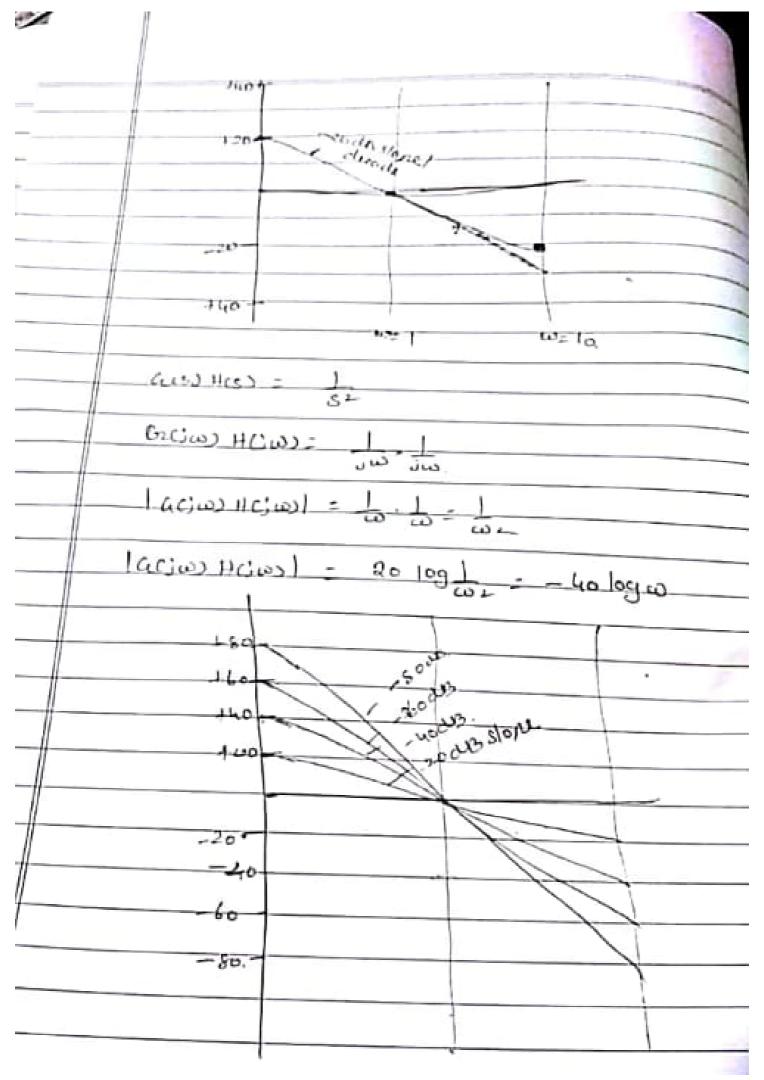


| Logarthonic Scales (Semilog     | RAILURIC SCOLE      |
|---------------------------------|---------------------|
| Autor o t                       | - CHUICHE           |
| Existing plans                  | D ORake             |
| Tustam H                        |                     |
| log 1 =0 = ( cg 10=1,           | acle                |
| CC.91                           |                     |
| of decade blood on to           | legieno = 3 distana |
| into puls as 10020, 10020       | 10. Pustur Duichel  |
| D HOT THEE HALL TO CO.          | 1- 11 1.            |
|                                 |                     |
| Scale available takes care of   | ogaetheric value of |
| 10)                             | I wanted            |
| Standard                        | 1                   |
| sypersurtation is that the much | It alienties        |
| division of magnitudes gets x   | isolated by the     |
| addition a subtraction resputi  | uly.                |
|                                 | r al                |
|                                 | con1                |
| k - >/- >/- >/-                 | 1 done store        |
| Plante Stoale                   | 1.                  |
|                                 | -3.1                |
|                                 | p. 10.2. 19"        |

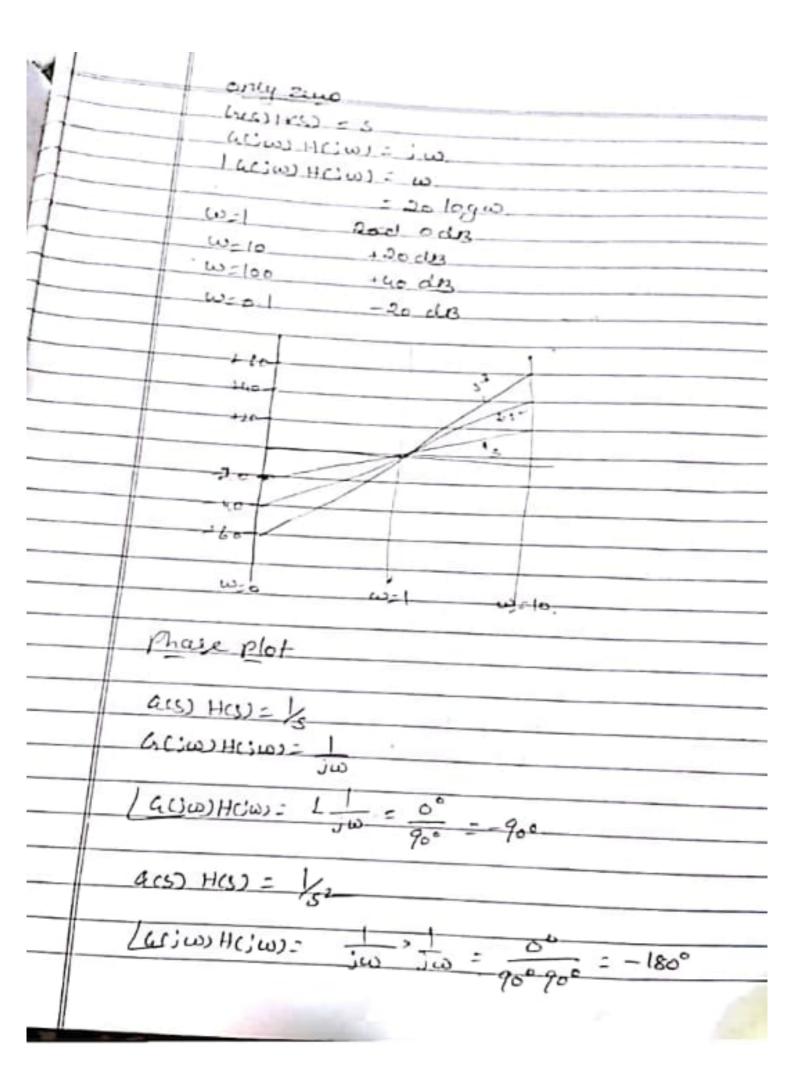
| 1       |  |
|---------|--|
| 1       | Slandard room of over loop Is Gom How  |
| -       | rensidu orcento = K's" (Sten)(Sten)  |
|         | 3º (s+P,) (s+P,)-  |
|         | a not both.  |
|         | Records in the new constant form.  |
|         | 5° (11 Tas) (11 Tos)   |
|         | Sr (11-Tas) (11-Tas)   |
|         | K = 21 ×22 / × K'  |
|         | P. VP.   |
|         | The standard to be or so is present k not both   |
|         | The standard time constant form can be denoted as  |
|         | C2(5) H(5) - K(1+ [15)(1+ [55)   |
|         | S' (1+ Tos)(1+ Tos)  |
|         | K- Expuetant stor gain P- type or the stor   |
|         | to the time constants of dillerent   |
| 10      | Poles & zeros  |
| C       |  |
| 12      | ech of the factor involved in one His above  |
| 100     | Il contiibute to maynitude and angle variation   |
| - 1 - 0 | (rico) 1100) in freq clonain   |
|         | Trent to the second sec |
|         | G(iw) H(iw) - K(H T, jw) (1+ T, jw)  |
| _       | (jw) (1+ Tajw) (1+ Tajw)   |
|         |  |
|         |  |
|         |  |
| П       |  |

| - 4<br> | Bode plats of standard lactors of according Replace s' by in to commend it to free domain final its magnitude as a function of in Supercys the magnitude to do by solegistation the place angle by using tan finaginal real part in degree the real part of the place angle by using tan finaginal real part of the place angle in degree real part of the place angle in degrees regainst lagues by varing angle in degrees regainst |
|---------|---|
| - 11    | factors slanguin 'k'  |
|         | (n(s) H(s) = k  (n(iw) H(iw) = (k2+0 = k  ik dB' value = 20 logick dB  the pay-slot  terk=10  120  120logk   may plot  20 logick   may plot   |
| 16      | Shifts the magnitude plot of 16200 How 1 a distance of 2010g k dis upwards it k>1   |



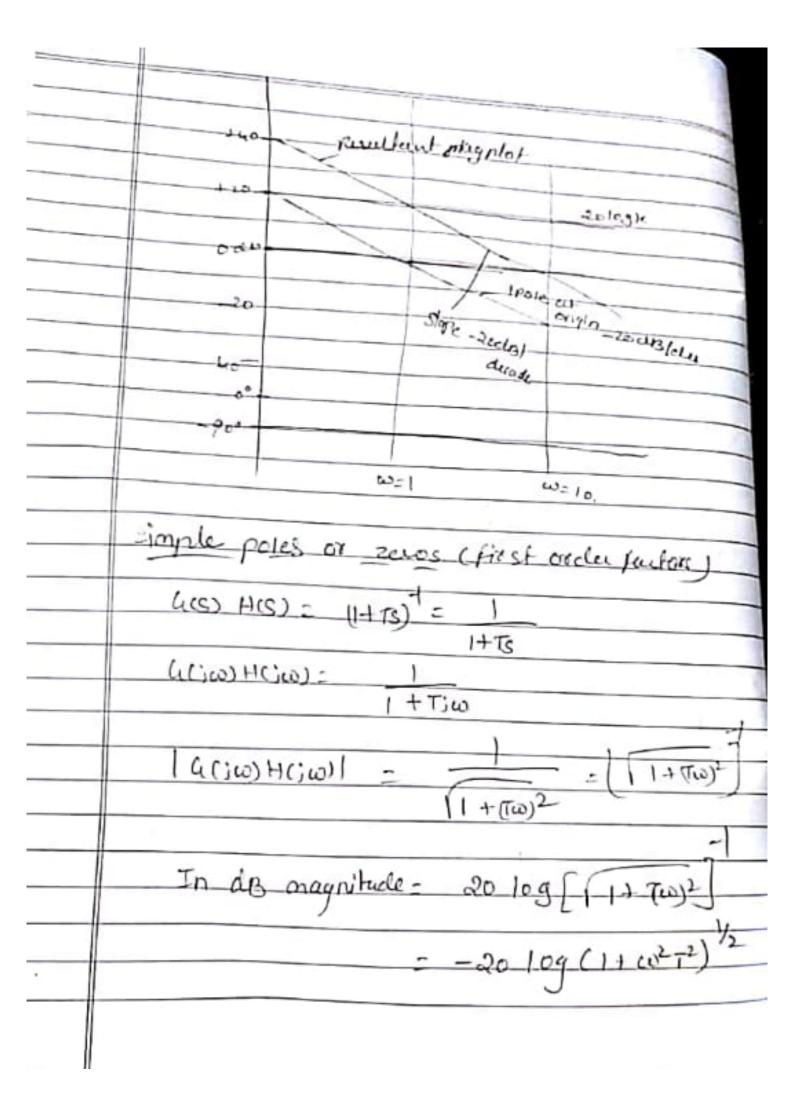


Scanned by CamScanner



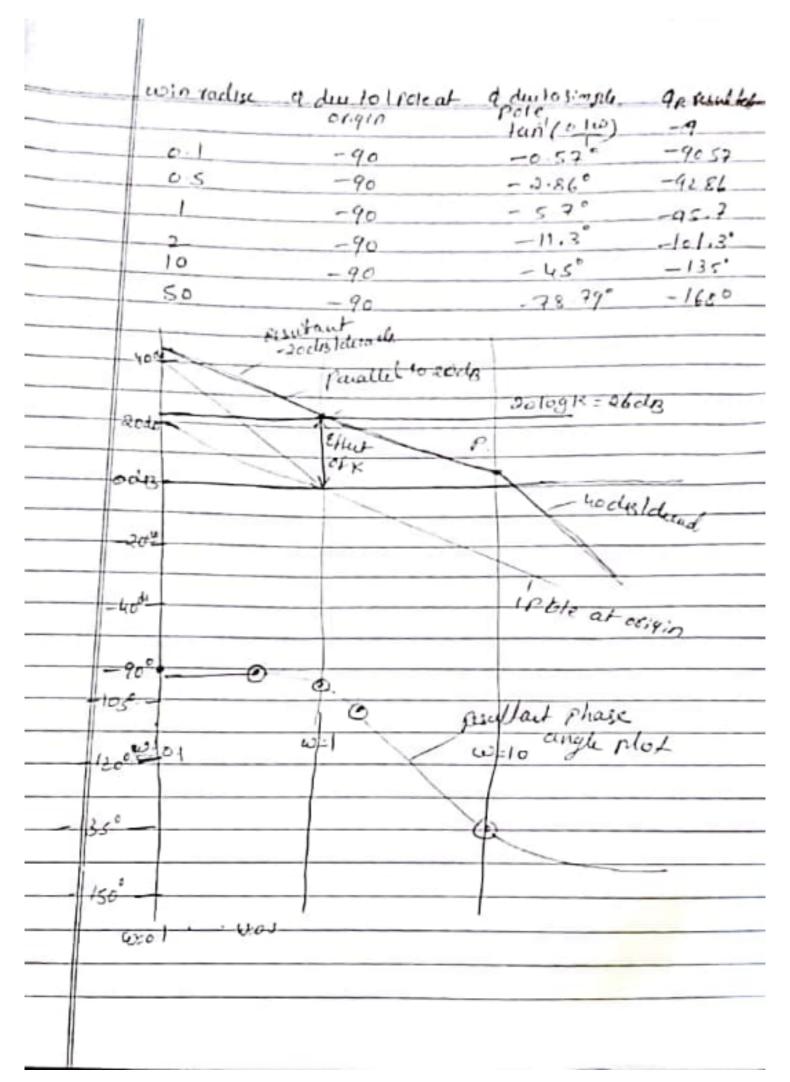
| · ·         |   |
|-------------|---|
|             |   |
|             | (1) (1) = 3   |
| 100         | دنس ازنس خ اس   |
| 141         | iω) Hciω) = 1:0 = lan' (w) . 400  |
|             |   |
|             | 27440 @ 08:910  |
|             | 1900 at 0690  |
|             | 6'  |
|             | - pole at origin  |
|             | 2 Poles at origin   |
|             |   |
|             |   |
| The mas     | anthodo al la car   |
| 66:010      | e straight lines having slope -20 x Pelusi  |
| ox 12       | Straight lines having slope -20 x Poly  |
| 100 100     | xp de/decade respectantly passing   |
|             |   |
|             | ENGINEER TOTAL OF THE PARTY OF |
| to sluct    | the Straight line drawn, upwards or   |
| cloconcocu  | de by solock to the upwards or  |
| white       | de by 20 logk dB depending on   |
|             | 1 1 1/1/10/10/11 0/ 1/11/11/11/11/11  |
| call be     | tion of k' & pole of zeros at oxigin  |
|             | LICENTIAL TO VICE YELDER  |
| 1-1-0-01 21 | nos at the oblgin at a dictaria   |
| 100100      | is appointed or downwards from the  |
| ods line    |   |
|             |   |
|             |   |
|             |   |
|             |   |
|             |   |
| II .        |   |

|         | Considu    | وتر) ۱۱رد) :   | lo.               | 1900                |
|---------|------------|--|-------------------|---------------------|
|         |            | الرجان الحال   | 5                 |                     |
|         | ورزيمي     | الدينما = الم  |                   |                     |
|         |            | 1.   |                   |                     |
| (1)     | constant   | k=10, ik   | contribution 1    | o ragnitude nlot    |
| -10     | 0111       | 60g.010 - 1  | lo de             |                     |
| 11.7    | 3-101      | all the of   | 1610 -21 -00      | regulade            |
|         |            |  |                   |                     |
|         |            | THE PARTY OF THE P | Section of ac     | W: 1 x o de line    |
|         | mais at    | 10/64  | may much u        |                     |
|         |            | - 20013  | due lok 1         | ochs due la pole at |
|         |            |  |                   |                     |
|         |            | - 20.db  |                   |                     |
| (1)     | Draw ma    | 0-11-4   |                   |                     |
| - čii 1 | Maro ols   | gailude pla  | FOY K.            |                     |
|         |            | CHILD VINE VI  | Dille. L'att      | ole at origin       |
|         |            |  |                   |                     |
|         |            |  |                   |                     |
| 4 6     | 7          | - 11011 DI- A  | ( ( ( ) = (       | de on the           |
|         |            |  | Track to which a  |                     |
| (10) D  | Yaw paral  | let line to  | the line too      | resenting pole      |
| - 0     | L origin f | for the pol  | nt obtained i     | o step to           |
|         |            |  |                   | 1314-119            |
| 10      | have any   | atot.  |                   |                     |
| 0       |            | H (160) = 1  | 10 0              |                     |
|         |            | contributions  | 10 Jan            | ( - 90°90°          |
|         | —-to       | A.P.   | yle by   Pole alo | Risules             |
|         | _ 0        | D O  | - 90°             | -900                |
|         | ( 0        | o°   | -900              | -40°                |
|         | 40         | ٥°   | -90-              | - 400               |
|         | 1000       | 0  | -900              | -40 *               |
|         |            |  | ,•                |                     |
|         |            |  |                   |                     |



|   | 11 was # 10 worker  |
|---|---|
|   | -20 10g 1 : ods   |
|   | it w 72 /7 w25271   |
|   | Haynitude = -20 10g wit de  |
|   | for high step it is strought line of stops where  |
|   | Freques to, couch sp separates the frey range into two. 1000 v light - 200 delates of the soft soft ode |
|   | -20 log wit = 0<br>-20 log wit = -20 log l<br>wit= 1  |
| - | This is the corner ising werely   |
|   |   |
|   |   |
|   |   |
|   |   |
|   |   |

| i Sketch the Bode plot for the slow having  hastes - Do  strois)  i) K=20 De log 20 = +26 cl3  ii) I pole at origin. The magnitude plot is strayet time passing through intersection pt of w=1 a odg  with slope of todap decacle  the simple pole = 1 (0 mpare with 1+75)  T=0.1  For magnitude plot T (0)  For magnitude plot T (0)  For magnitude plot T (0)  Shift intersection pt of w=1 x ods on on 20 logk  time a from this pt deaw line parallel to ta  line representing 1 pole at origin. This line will  have slope of -20 ds decacle  iv) Thus addition of K x poles at origin will online  fill nx factor becomes dominant le at w=w=10  (x) from w=10 onwards will be (-20 ds) decacle  Starting slope) + (-20 ds) decacle  simple pole le resultant is -40 cls) decacle |  |
|---|--|
| i) K= 20 De log 20 = +26 th3  li) I pole at origin. Its magnitude plot is strongent dine passing through intersection pt of w=1 a odg with slope of -20 desplaces to pare with 1 tols imply pole = 1 tols 1+ Ts  T=0.1  (ii) Simply pole = 1 oraclesce  For magnitude plot T of 1 oraclesce  ii) Prace the for I pole at origin.  lii) Shift intersection pt of w=1 x odb on an 20 logk three a from this pt deare line parallel to the time representing 1 pole at origin. This line will have slope of -20 classocial dearde  iv) Thus addition of k x poles at origin will online the form w=10 answers dominant le at w=w=10.  (x) from w=10 answers will be (-20 classocial as starting slope) + (-20 classocial) dearde   |  |
| i) K= 20 De log 20 = +26 t/3  li) I pole at origin. Ils magnitude plot is stroyetherine passing through intersection pt of w=1 a odg with slope of -20 desplaceable (iii) simple pole = 1 compare with 1 tols  T=01  (b) Prace Intersection pt of w=1 a odg on an 20 logk line a from this pt deare line poundled to the line representing 1 pole at origin. This line will have slope of -20 desplaceable  iv) Thus addition of k & poles at origin will online the factor of k & poles at origin will online the form w=10 and distinct a we we =10  (v) from w=10 ancources will be (-20 desideracle as specifing slope) + (-20 desideracle) due to the  | i Skutch the Book and the state of the           |
| i) K= 20 De log 20 = +26 th3  li) I pole at origin. Ils magnitude plot is stroyetherine passing through intersection pt of w=1 a odg with slope of -20 desplaceasts  (iii) simple pole = 1 compare with 1  I tols  T=0.1  (b) Prace line for I pole at origin.  (ii) Shift intersection pt of w=1 a odb on an 20 logk line a from this pt deare line representing I pole at origin. This line will have slope of -20 desplaceate  iv) Thus addition of k & poles at origin will online the factor of k & poles at origin will online fill nxt factor becomes dominant le at w=w=10.  (v) from w=10 ancowers will be (-20 desidecacte as starting slope) + (-20 desidecacte) due to the  | 44)1145) - Do                                    |
| Line passing though intersection pt of w=1 & odg  with slope of -social decase  this simple pole = 1  to magnitude plot 7  to bear 20 log k line  ii) Decar Line for 1 pole at origin  line a from this pt draw line parallel to ta  line a from this pt draw line parallel to ta  line separating   pole at origin. This line will  have slope of -20 classeade  iv) trues addition of k & poles at origin will online  till nxt factor becomes dominant le at w=we=10  (x) from w=10 oncource will be (-20 classeade as  Starting slope) + (-20 classeade) due to the   |  |
| Line passing though intersection pt of w=1 & odg  with slope of -social decase  this simple pole = 1  to magnitude plot 7  to bear 20 log k line  ii) Decar Line for 1 pole at origin  line a from this pt draw line parallel to ta  line a from this pt draw line parallel to ta  line separating   pole at origin. This line will  have slope of -20 classeade  iv) trues addition of k & poles at origin will online  till nxt factor becomes dominant le at w=we=10  (x) from w=10 oncource will be (-20 classeade as  Starting slope) + (-20 classeade) due to the   | i) Kon   |
| Line passing though intersection pt of w=1 & odg  with slope of -social decase  this simple pole = 1  to magnitude plot 7  to bear 20 log k line  ii) Decar Line for 1 pole at origin  line a from this pt draw line parallel to ta  line a from this pt draw line parallel to ta  line separating   pole at origin. This line will  have slope of -20 classeade  iv) trues addition of k & poles at origin will online  till nxt factor becomes dominant le at w=we=10  (x) from w=10 oncource will be (-20 classeade as  Starting slope) + (-20 classeade) due to the   | 20 20 10920 = +261/3                             |
| For magnified plot 7 of loradises  For magnified plot 7 of loradises  The loss of loradises  For magnified plot 7 of loradises  (1) Praid 20 log k line  (1) Praid line for 1 pole at origin  (1) Shift intersection pt of well a ods on an 20 log k  Line a from this pt diaw line parallel to ta  line representing 1 pole at origin. This line will  have slope of -20 ds Identical  (1) Thus addition of k & poles at origin will online  fill nxt factor becomes dominant le at we we la  (V) from we to original decade at  Starting slope) + (-20 ds Identical) due to the   | Ji) I pole of our of the on it de old is should  |
| For magnified plot 7 of loradises  For magnified plot 7 of loradises  The loss of loradises  For magnified plot 7 of loradises  (1) Praid 20 log k line  (1) Praid line for 1 pole at origin  (1) Shift intersection pt of well a ods on an 20 log k  Line a from this pt diaw line parallel to ta  line representing 1 pole at origin. This line will  have slope of -20 ds Identical  (1) Thus addition of k & poles at origin will online  fill nxt factor becomes dominant le at we we la  (V) from we to original decade at  Starting slope) + (-20 ds Identical) due to the   | Line passing through inter tion of a will a note |
| For magnified plot T  (*) Praw 20 log k line  i) Praw In for I pole at origin  lii) Shift intersection pt of w=1 x ads on an 20 log k  line a from this pt draw line parallel to to  line bepresenting I pole at origin. This line will  have slope of -20 als Idenate  iv) Thus addition of k x poles at origin will online  fill nxt factor becomes dominant to at w=wc=1a  (x) from w=10 on course will be (-20 als Idenate as  Starting Slope) + (-20 als Idenate) due to the   | teath slave of the                               |
| For magnitude plot T of = loradelsee  For magnitude plot T of = loradelsee  i) Prace I me for I pole at origin  lii) Shift intersection pt of w=1 x ado on an 20 logk  line a from this pt dear line parallel to ta  line representing I pole at origin. This line will  have slope of -20 als Idenacle  iv) Thus addition of K x poles at origin will online  fill nxt factor becomes dominant le at w=wc=10  (x) from w=10 ancomes will be (-20 als Idenacle as  Starting Slope) + (-20 da Idenacle) dome to the  | this comple pole - 1 consumption                 |
| For magnitude plot T of - lorade see  i) Prace 20 logk line  ii) Prace Line for I pole at origin  liii) Shift intersection pt of w=1 & ods on an 20 logk  Line a from this pt dear line parallel to the  line representing I pole at origin. This line will  have slope of -20 ds Ideade  iv) Thus addition of K & poles at origin will online  till nxt factor becomes dominant le at w=we=10  (V) from w=10 encoures will be (-20 ds Ideade as  Starting slope) + (-20 ds Ideade) de to the   | 1+015 1+75                                       |
| i) Praw 20 log k line ii) Praw Line for 1 pole at origin lii) Shift intersection pt of w=1 v ads on an 20 log k line a from this pt deaw line parallel to to line representing 1 pole at origin. This line will have slope of -20 ds Ideade iv) Thus addition of k v poles at origin will online fill nxt factor becomes dominant le at w=we=10  (V) from w=10 ancoures will be (-20 ds Ideade as Starting Slope) + (-20 ds Ideade) de to the   |  |
| i) Praw 20 log k line ii) Praw Line for 1 pole at origin lii) Shift intersection pt of w=1 v ads on an 20 log k line a from this pt deaw line parallel to to line representing 1 pole at origin. This line will have slope of -20 ds Ideade iv) Thus addition of k v poles at origin will online fill nxt factor becomes dominant le at w=we=10  (V) from w=10 ancoures will be (-20 ds Ideade as Starting Slope) + (-20 ds Ideade) de to the   | Con to = / - lorade see                          |
| lii) Shift intersection pt of w=1 v odB on an 20 logk  Line a from this pt diaw line parallel to to  line representing I pole at origin. This line will  have slope of -20 dB   decade  iv) Thus addition of K v poles at origin will online  fill nxt factor becomes dominant le at w=we=10  (v) from w=10 oncoures will be (-20 dB   decade as  Starting slope) + (-20 dB   decade) due to the  | magnitude plot                                   |
| Line a from this pt diaw line parallel to to sine separation pt of w=1 & ode on an 20 logk line a from this pt diaw line parallel to to line separating I pole at origin. This line will have slope of -20 all Idenacle  iv) Thus addition of K & poles at origin will online fill nxt factor becomes dominant le at w= wc=10  (V) from w=10 oncomes will be (-20 all Idenacle as Starting Stope) + (-20 dal Idenacle) die to the   | ii) Occasion 20 log k line                       |
| Line Experienting   pole at origin. This line will have slope of -20 dB   decade  iv) Thus addition of K & poles at origin will online fill nxt factor becomes dominant le at w= we= 10  (V) from w= 10 oncomes will be (-20 dB   decade as Starting Stops) + (-20 dB   decade) decade as   | lii) Slich interest pole at origin               |
| have slope of -20 cls Ideracle  iv) Trus addition of K & poles at Oligin will online  fill nxt factor becomes dominant le at w=wc=la  (v) from w= 10 oneonels will be (-20 cls Ideracle as  Starting Slope) + (-20 cla Ideracle) due to the   | The section pt of w=   v odB on an 20 logk       |
| have slope of -20 cls Ideracle  iv) Trus addition of K & poles at Oligin will online  fill nxt factor becomes dominant le at w=wc=la  (v) from w= 10 oneonels will be (-20 cls Ideracle as  Starting Slope) + (-20 cla Ideracle) due to the   | line terminalis of dear line parallel to ta      |
| fill nxt factor becomes dominant le at w=we=la  (V) from w= 10 oncourés will be (-Rochaldecache as  Starting Slope) + (-Rochaldecache) due to the   | pore at origin. Itus line will                   |
| (V) from w= 10 on couch will be (-Rochalderach as Starting Stops) + (-Rochalderach du to the  | in True of -20 dB lacade                         |
| (V) from w= 10 on couch will be (-Rochalderach as Starting Stops) + (-Rochalderach ) due to the   | lin out de la poles at oligin will ontinue       |
| Starting Stops) + (- 20 cla I duade) due to the   | The factor becomes dominant le at well-me-la     |
| Starting Stops) + (- 20 da I decade) du to tere   | (V) from w= 10 greates will be 1-200 placed as   |
| Simple pole le résultant is - hochs idecade   | - Starting Stone) + (- 20 da decade) du to tu    |
|   | - Simple pole le resultant is - 40 des descurbe  |
|   |  |
|   |  |
|   |  |
|   |  |
|   |  |
|   |  |
|   |  |



| Steps to sketch the Bode plot  1. Supress given 4000 1100 into time constant form  2. Draw or line of 20 tog k dB  3. praco a line of appropriate stope representing  |
|---|
| 3. Prace a line of appropriate dope representing poles of zeros at the origin, passing through intersuction point of well a o dB through slip this intersection pt on 20 logk line a drawn in steps.  This is addition of constant k a noise poles or such says.  Such and the origin.              |
| S. Change the slope of this line at various corner field by appropriate value i.e. depending upon colored feetor is occurring at corner frequency.  For a simple pole, slope much be changed by -20 dB Idecade, for a simple pote zero by trackelle etc. Do not draw these individual lines. Change |
| the slope of line obtained in sleps by respective value & craw line with resultant slope (online this line till it intersults nx) corner frequence continue this line slope & continue. Apply nucueus concertion for a nachable bentor  Expane the Phase anger take & obtain the take               |
| Of wax resultant phase angle of by actual laculation. Plot these pts or chaw the smooth curve obtaining the nussary these angle plot  |
|   |