Problems on Bode Plot

1) Draw the Bode's plot for the system whose open loop transfer function is given by

   $G(s) = \frac{e^{-s}}{s(s+)(s+2)}$

   Also find the value of K that could cause sustained oscillations in the system. (Sum-04)

2) Draw the Bode for a given open loop transfer function as (Win-04)

   $G(s) = \frac{25\,(s+2)e^{-0.3s}}{s^2(s+1)(s+10)}$

   Also find the value of K for:

   (i) Gain margin of 10 db's

   (ii) Phase margin of(-90^0)

   (iii) For gain cross over frequency $\omega_g = 0.5$

3) Draw the Bode for the system, whose open loop transfer function as (Win-05)

   $G(s) = \frac{2500\,(s+10)}{s^2(s+1)(s+10)}$

   Indicate the gain margin and phase margin.

4) The open loop transfer function of a certain unity feedback system is: (Sum-05)

   $G(s) = \frac{K}{s(s+2)(s+10)}$

   Construct the approximate Bode asymptotic and phase angle plot for a value of K such that the system is just on the verge of instability at that value of K

5) Given

   $G(s) = \frac{170\left(\frac{S}{10}+1\right)}{S\left(1+\frac{S}{1.75}\right)\left(1+\frac{S}{60}\right)}$

   Draw Bode Plot.

   Determine gain cross over frequency, phase cross over frequency, gain margin and phase margin. Also determine the stability of closed loop system. (Sum-06)

6) A certain unity feedback system is given by (Win-06)

   $G(s) = \frac{K}{s(1+s)(1+0.1s)}$

   Draw the Bode plot and determine from the plot value of K so as to have:

   (i) Gain margin = 5 Db

   (ii) Phase margin = 50^0

7) Draw the bode plot whose OLTF is given by, (Sum-07)

   $GH(s) = \frac{150\,(s+2)e^{-0.01s}}{s(s-1)(s^2+4s+25)}$

8) Given that

G(s) = $\frac{10}{s\,(1+0.8s)\,(1+0.5s)}$

Draw the Bode plot, find phase cross over frequency and gain cross over frequency (Sum-09)

9) Construct the Bode Plot whose : (Win-09)

GH(s) =$\frac{12s^2(s+4)}{(s+1)\,(s+7)\,(s^2+4s+121)}$

Also find

(i) Gain margin

(ii) Phase margin

(iii) Gain cross over frequency

10) The open loop transfer function of a certain unity feedback system is: (Win-11)

G(s) = $\frac{K}{s(s+2)(s+20)}$

Construct the Bode Plot and determine the limiting value of K to be system stable.

11) Draw the Bode plot for the system, whose open loop transfer function is (Win-07)

G(s) =$\frac{75(1+0.2s)}{s\,(s^2+16s+100)}$

12) Sketch the Bode plot for the transfer function: (Sum-11)

G(s) = $\frac{1000}{s\,(1+0.1s)\,(1+0.001s)}$

Determine

(i) Gain cross over frequency

(ii) Phase cross over frequency

(iii) G.M and P.M

(iv) Stability of the given system

13) Draw the Bode plot for the following transfer function (Sum-10)

G(s) = $\frac{Ke^{-0.2s}}{s(\,2+s)(1+.12s)}$

Find gain margin and Phase margin for the system to be stable.

14) Draw the Bode plot for the system and determine value of 'K' so that : (Win-10)

(iii) Gain margin = 12 dB and

(iv) Phase margin = 30^0

G(s).H(s) = $\frac{K}{s(1+s)(1+\frac{s}{10})}$

15) For a certain feedback system (Sum-12)

G(s).H(s) = $\frac{3\,(s+1)\,(s+6)}{s^2(s^2+18s+400)}$

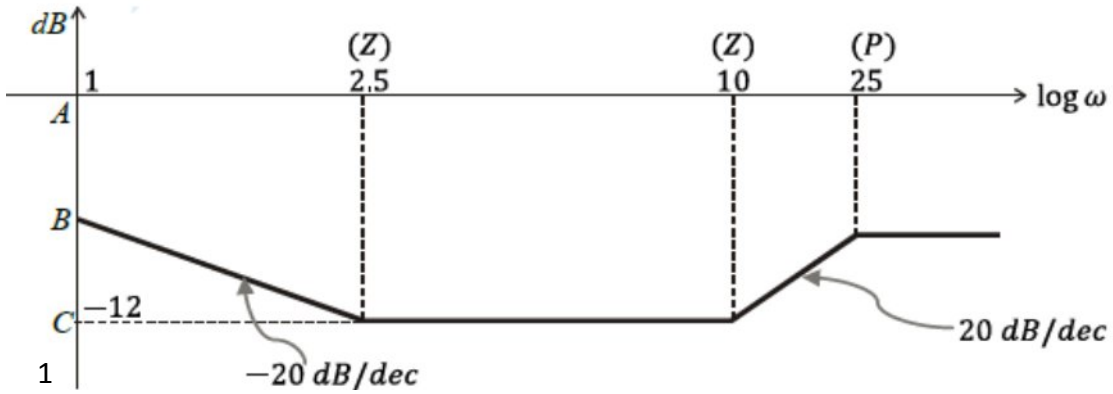
Sketch the Bode Plot and Comment on G.M and P.M and stability.

16) Sketch the Bode plot for a unity feedback system characterized by the loop transfer function (Sum-08)

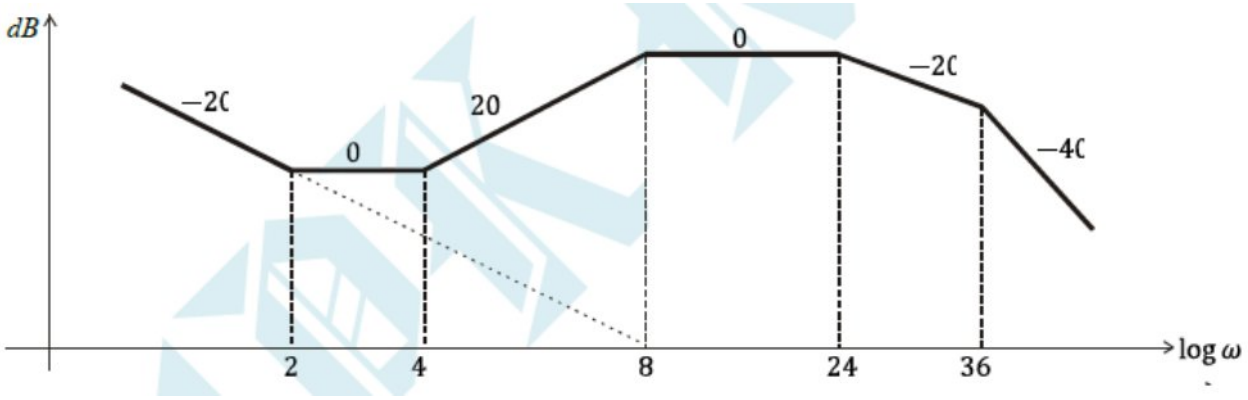
G(s) = $\frac{K\,(1+0.2s)\,(1+0.025s)}{s^3(1+0.001s)\,(1+0.005s)}$

Show that the system is conditionally stable. Find the range of K for which the system is stable.

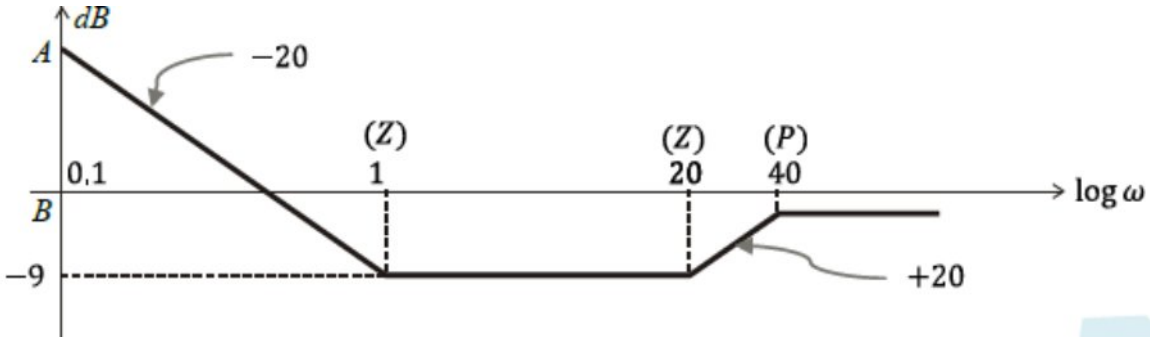
17) Find the transfer function from the Bode plot shown in fig. (Sum-10)



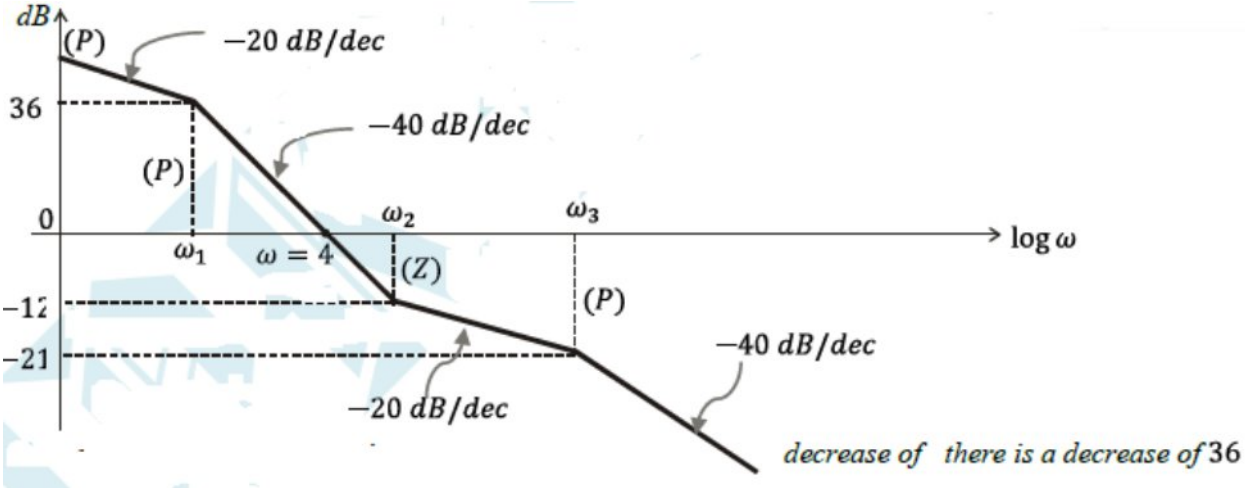
18) Find the open-loop TF of a system, whose approximate plot is as shown.



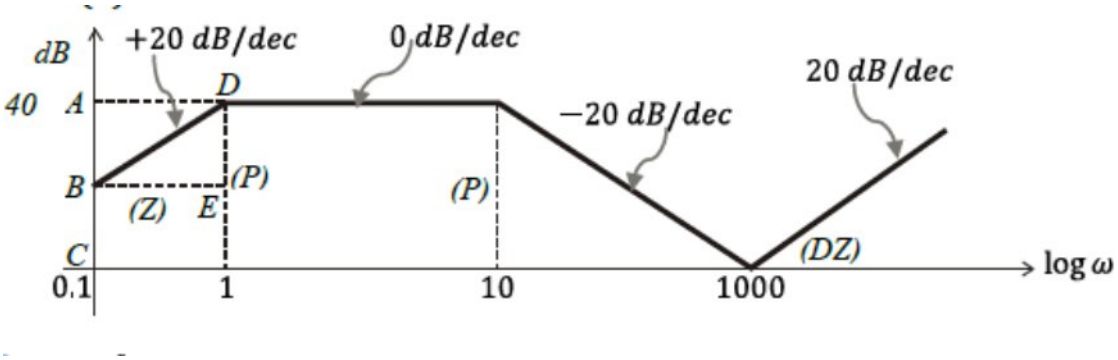
19) Find the open-loop TF of a system, whose approximate plot is as shown.



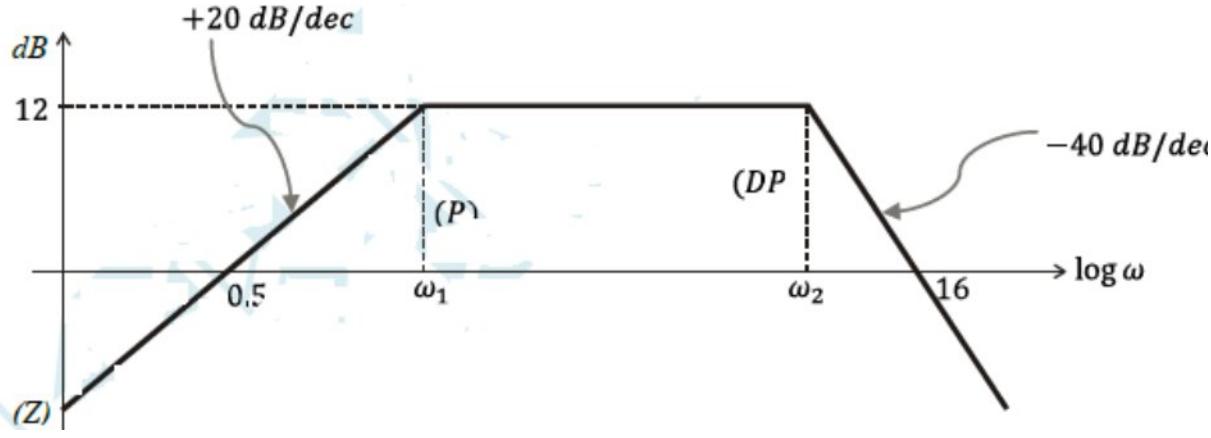
20) Derive the Transfer function of the system from the data given on the Bode diagram given below.



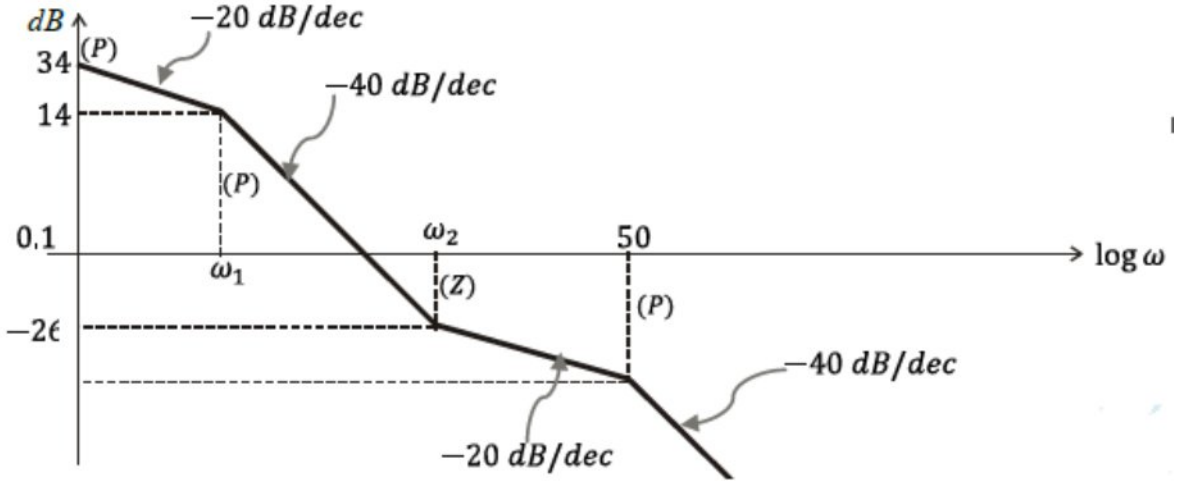
21) The sketch given shows the Bode Magnitude plot for a system. Obtain the Transfer function



22) Estimate the Transfer function for the Bode Magnitude plot shown in figure.



23) The bode plot (magnitude) of a unity feed back control system is as shown in the fig. Obtain the phase plot



24) Plot the Bode diagram for the following transfer function and obtain the gain and phase cross over frequencies G(S) =Ks^2 / (1+0.2S) (1+0.02S).Determine the value of K for a gain cross over frequency of 20 rad/sec.
25) Sketch the Bode plot and hence find Gain cross over frequency, Phase cross over frequency, Gain margin and Phase margin.
G(S) = 0.75(1+0.2S)/ S (1+0.5S) (1+0.1S)
26) Draw the Bode Plot for the transfer function- G(s) = 50/s (1+0.25s) (1+0.1s). From the plot determine Gain Margin & Phase Margin