

SE - Sem - IV (Biomed.) R.

SE - B Med - Sem IV (R)

16/6/14

EICS
Electronics Instruments &
Control Systems

(3 Hours)

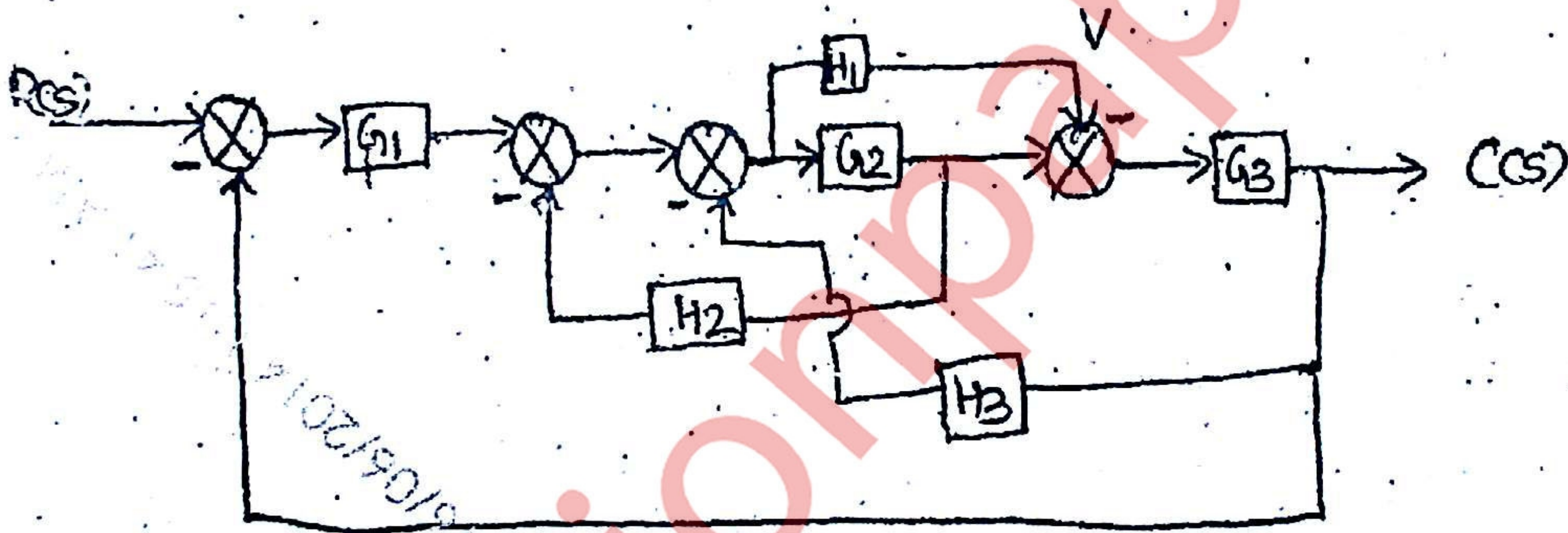
QP Code : NP-19877

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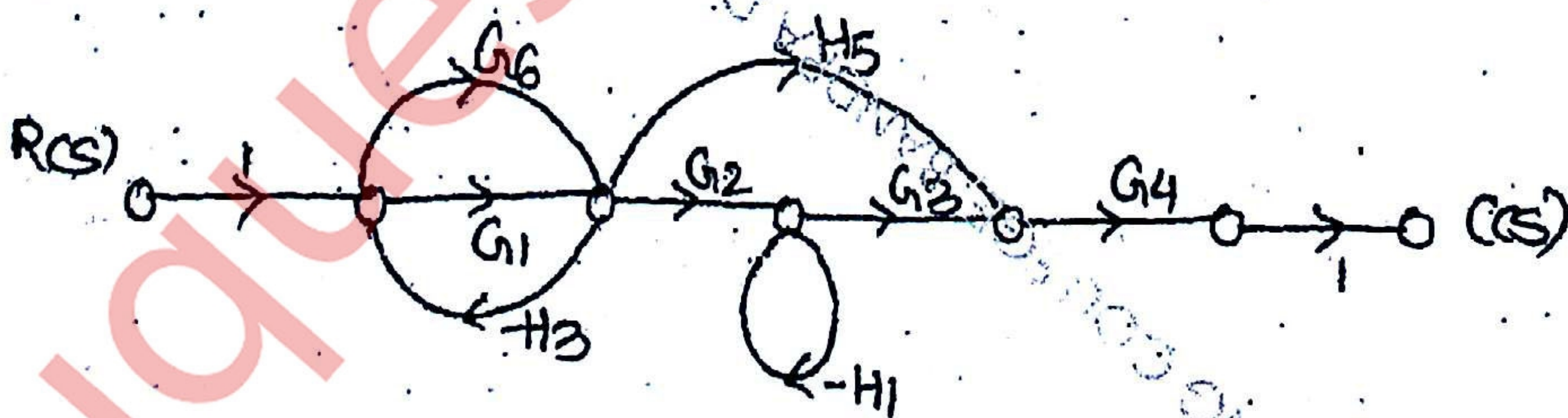
[Total Marks : 80

- N.B. (1) Question No. 1 is compulsory.
(2) Attempt any three out of remaining five questions.
(3) Figures to the right indicate full marks.
(4) Assume suitable data wherever necessary.

1. (a) Compare a dual beam oscilloscope with dual trace oscilloscope. 20
(b) Explain true R.M.S. responding meter.
(c) Define and differentiate between open loop and closed loop system.
(d) How is time domain different from frequency domain ?
2. (a) Check the stability of the system whose characteristic equation is— 4
 $s^5 + s^4 + 2s^3 + 2s^2 + 3s + 5 = 0$
(b) Using block diagram reduction technique find the transfer function of the given 8
system.



- (c) State the Mason's gain formula. Determine the transfer function for the given system using Mason's gain formula. 8



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3. (a) Obtain the root locus of the system—

$$G(s)H(s) = \frac{k}{s(s+4)(s^2+4s+20)}$$

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- (b) Obtain the bode plot for the given control system. Also find out Gain Margin (GM), Phase Margin (PM), Gain cross over frequency (GCF) and phase cross over frequency (PCF).

$$G(s) = \frac{10s}{s+5}$$

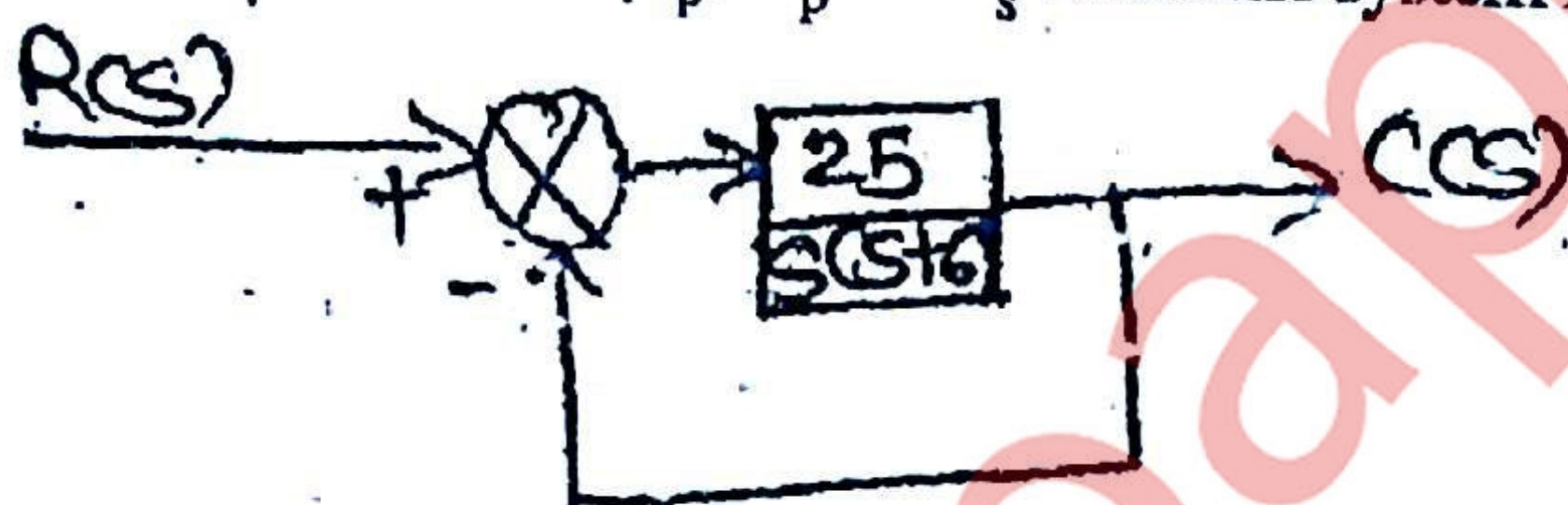
OR

- (b) Obtain the Polar Plot for the given system.

$$G(s) = \frac{1+5s}{1+3s}$$

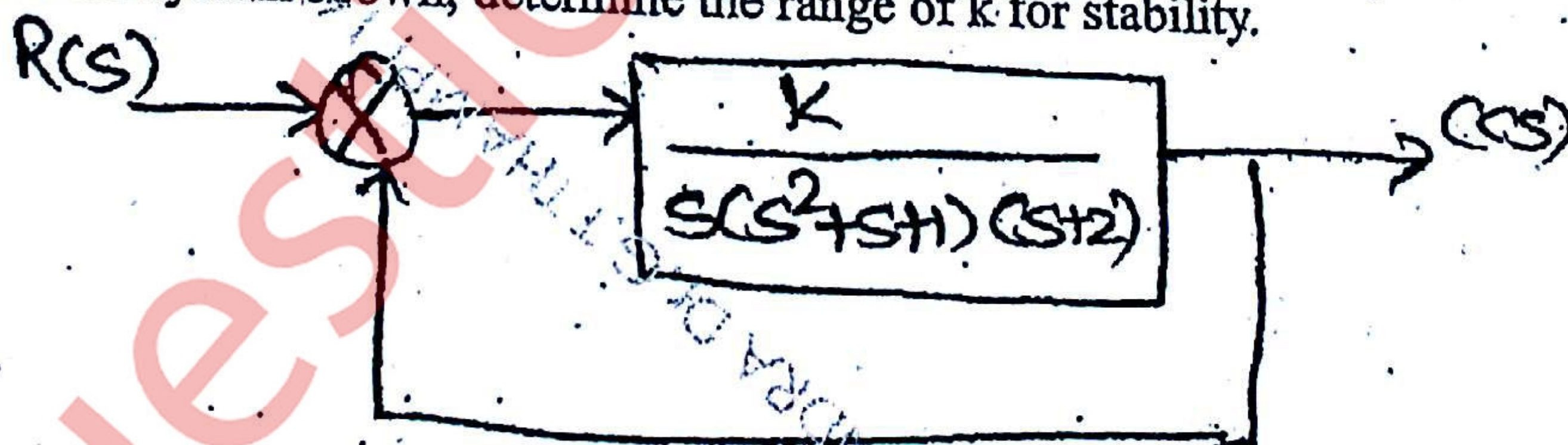
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4. (a) Explain effect of zeta on a second order system. 5
 (b) For the system shown, find t_r , t_p , m_p and t_s when the system is subjected to a unit step input. 5

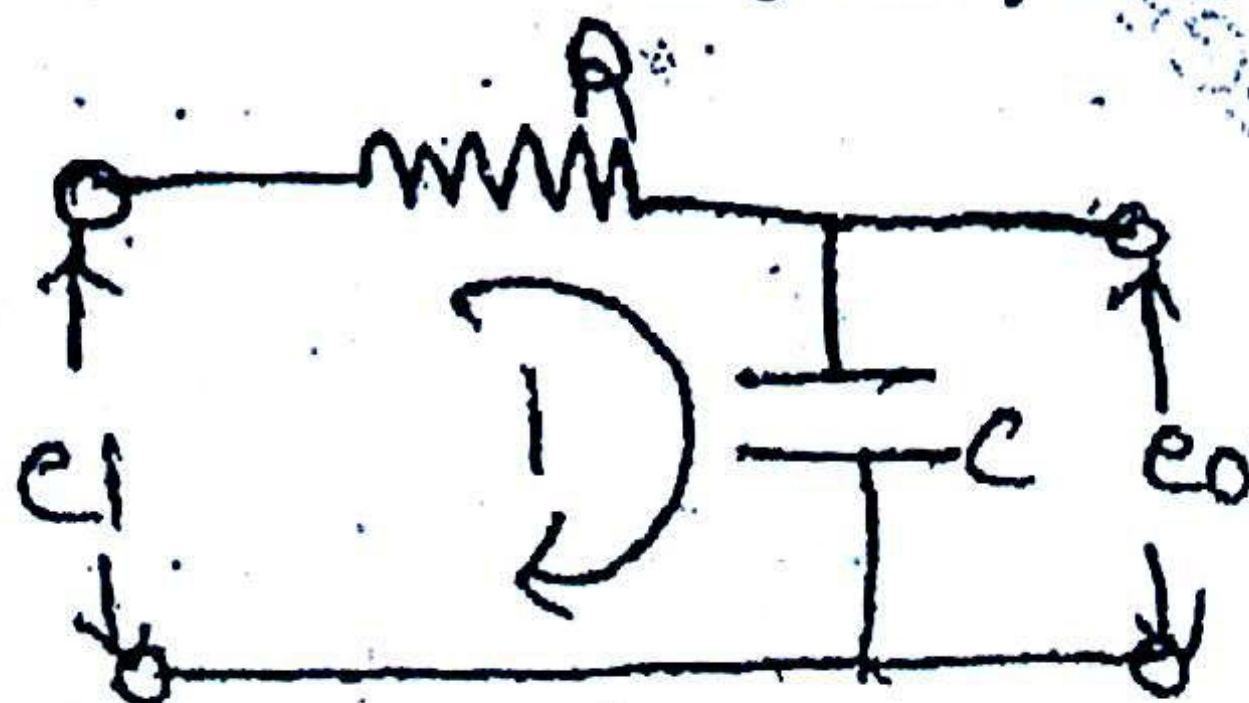


- (c) Explain Focus and intensity control in C.R.O. 5
 (d) State the requirements of good laboratory signal generator. 5

5. (a) Draw and explain basic block diagram of CRO. Explain each function block in detail. 10
 (b) For the system shown, determine the range of k for stability. 5



- (c) Obtain the transfer function of the given system. 5



6. (a) Explain Peak and Average responding voltmeter. 10
 (b) Explain in detail, working of digital frequency meter. 10