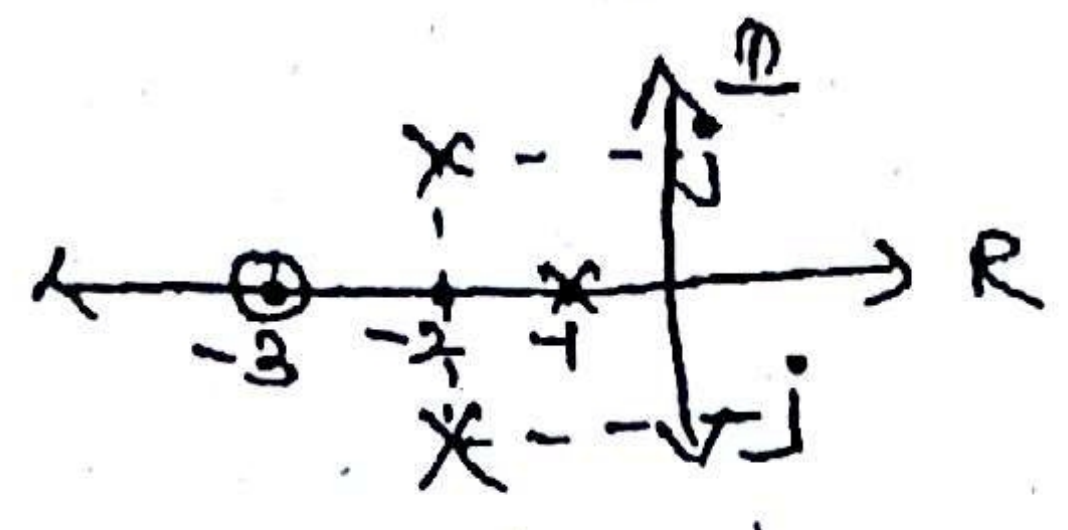(3 Hours) [Total Marks : 80

(N.B. Attempt any **four** questions.)

1. Solve any four :—
   (a) Differentiate between Dual Beam/Dual Trace Oscilloscope.   5
   (b) Find Time Response of 1st Order system to unit step.   5
   (c) What are factors involved in selection of a voltmeter.   5
   (d) Determine T.F. if d.c. gain is equal to 10 for system whose pole-zero plot is   5

   (e) Derive transfer function for closed loop system.   5

2. (a) Reduce given B.D. to its simple form and hence find $\dfrac{C(s)}{R(s)}$ 10
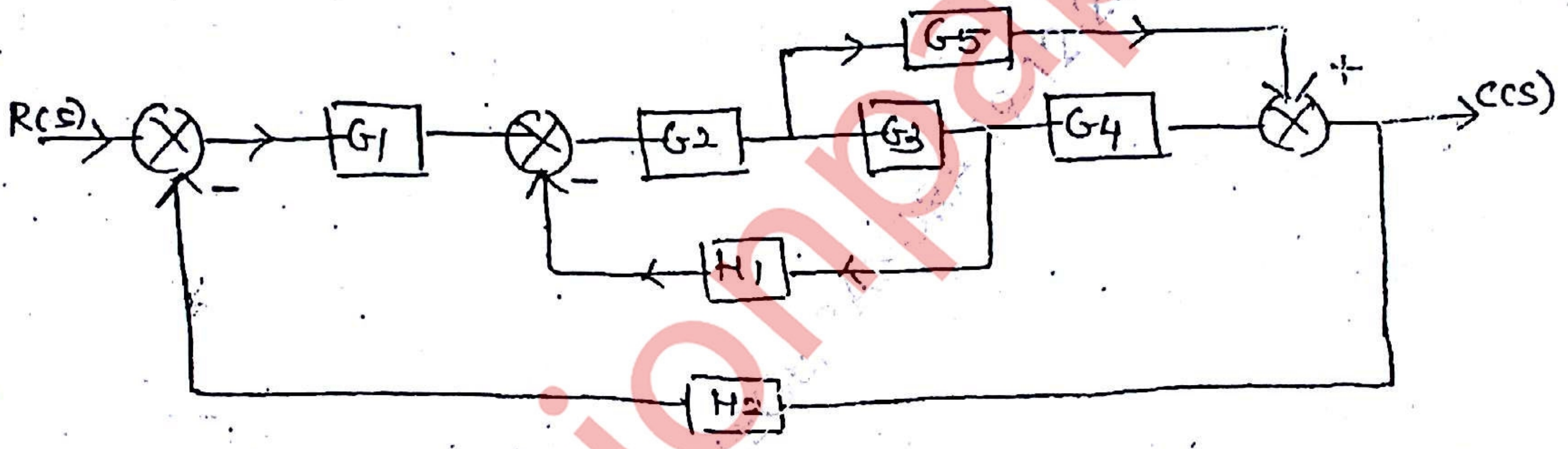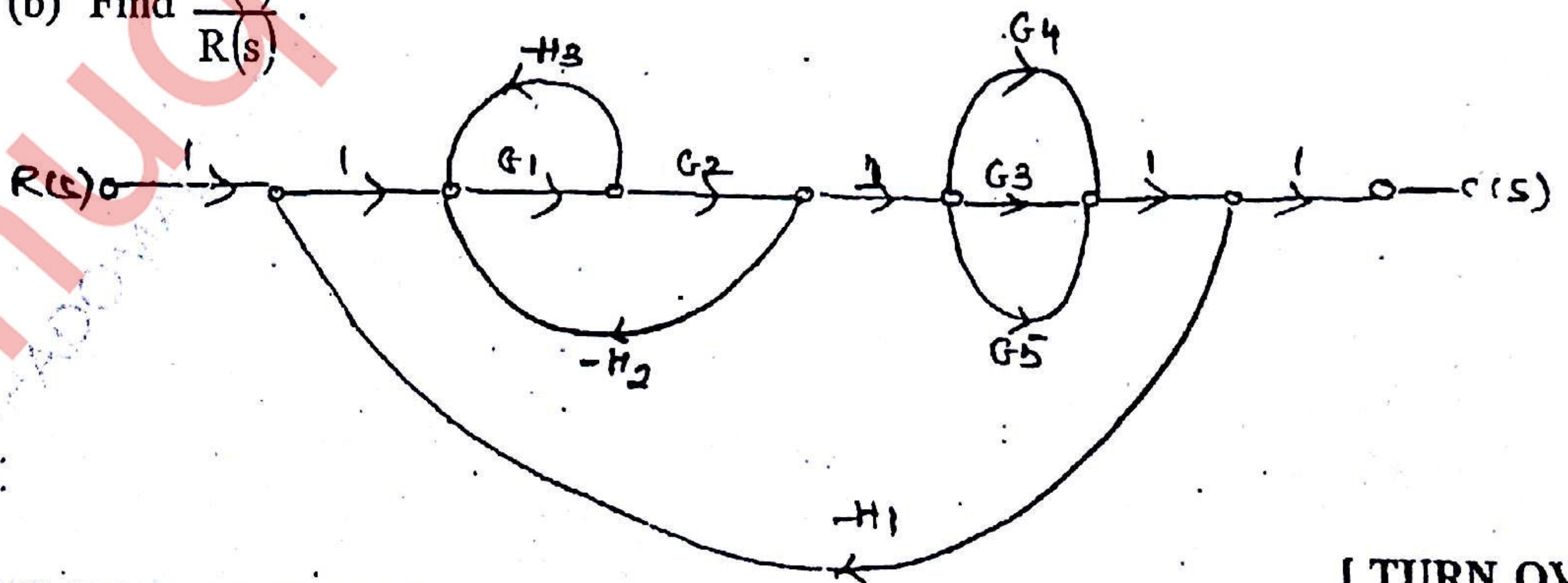

   (b) What is lissajous pattern ? How it is useful in frequency and phase measurement ?   10

3. (a) Draw Magnitude and Phase Bode Plot for following function and calculate Wgc, Wpc, GM, PM. Comment on stability.   12

$$G(s)H(s) = \frac{80}{s(s+2)(s+20)}$$

   (b) Find $\dfrac{C(s)}{R(s)}$.   8

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4. (a) Determine whether given system is stable or not :—   7
$$s^6 + 2s^5 + 8s^4 + 12s^3 + 20s^2 + 16s + 16 = 0 \ .$$

   (b) Determine how many roots will lie to RHS :—   3
$$s^5 + 4s^4 + 10s^2 + 5s + 24 = 0 \ .$$

   (c) With neat Block Diagram and Waveforms explain operation of digital phasemeter.   10

5. (a) Describe working of R-2R ladder DAC.

   (b) A second order system is given by —   1

$$\frac{C(s)}{R(s)} = \frac{25}{s^2 + 6s + 25}$$

   Find its rise time, peak time, peak overshoot and setting time if subjected to unit step input.

6. (a) Explain function of Delay Line, Time Base and Trigger circuit in CRO.   10

   (b) Sketch Root Locus for system having   10

$$G(s)H(s) = \frac{K}{s\left(s^2 + 2s + 2\right)}$$

GN-Con: 12099-14.