

Time: 3 Hours

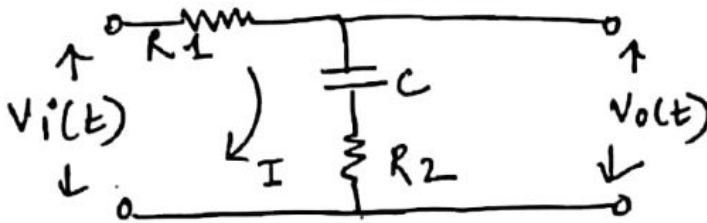
Total Marks: 80

- Attempt four questions, question no:1 is Compulsory.
- Assume suitable data wherever required.
- Answers to the questions should be grouped together.
- Figure to the right of question indicates full marks.

Attempt all:

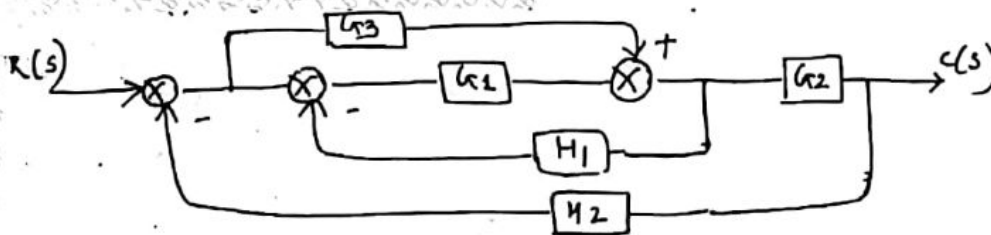
20

- a) Define accuracy, precision, linearity and sensitivity
- b) Find the transfer function of the given electrical network



- c) List various types of temperature transducers and write the applications of each transducers
- d) Explain basic telemetry system
- e) $s^3 - 4s^2 + s + 6 = 0$ is the characteristic equation of a certain control system. Determine its stability by Hurwitz method

- f) Explain measurement of inductance using Maxwell bridge .Also list the applications of it 10
- g) Using Block diagram reduction techniques, find closed loop transfer function 10



- (a) Sketch the root locus of a unity feedback control system with $G(s) = \frac{K}{s(s+5)(s+10)}$.Comment on the stability 10
- (b) A Unity feedback control system has $G(S) = \frac{80}{s(s+2)(s+20)}$. Draw the bode plot and predict stability y

4

- (a) Explain the components of analog data acquisition system
- (b) For a unity feedback system

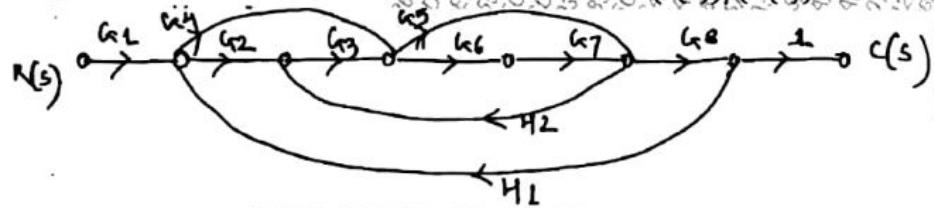
$$G(s) = \frac{k}{s(1+0.4s)(1+0.25s)}$$

find range of values of K, marginal value of K and frequency of sustained oscillations

- (c) Explain in detail the working principal of LVDT with neat diagram and explain its application

5

- (a) Using Mason's Gain formula evaluate the transfer function $(C(S))/(R(S))$



- (b) Explain the working principle of Q meter Mention the sources of errors in Q meter

6

- (a)
 - (i) Explain multiplexing and discuss any one multiplexing system
 - (ii) For a unity feedback system having open loop transfer function

$$\frac{K(s+2)}{s(s^3+7s^2+12s)}$$

Find the type of system and all error coefficients

- (i) Draw and explain the working of capacitive transducer for pressure measurement
- (ii) How stability of the system can be analyzed using Nyquist criterion