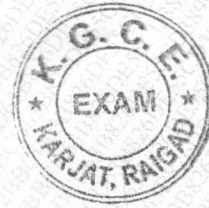


Time: 3 Hours

Total Marks: 80

N.B:

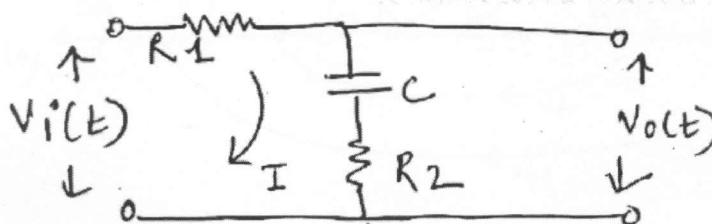
- (1) Attempt **four** questions, question **no:1** is Compulsory.
- (2) Assume suitable data wherever required.
- (3) Answers to the questions should be grouped together.
- (4) Figure to the **right** of question indicates **full** marks.



1. Attempt all:

20

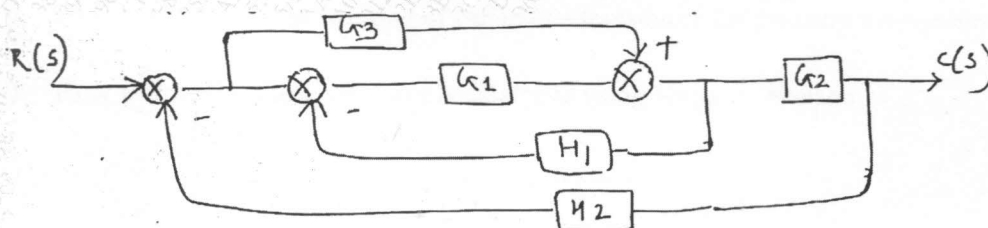
- (a) Define accuracy, precision, linearity and sensitivity
- (b) Find the transfer function of the given electrical network



- (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

2.

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



3

- (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

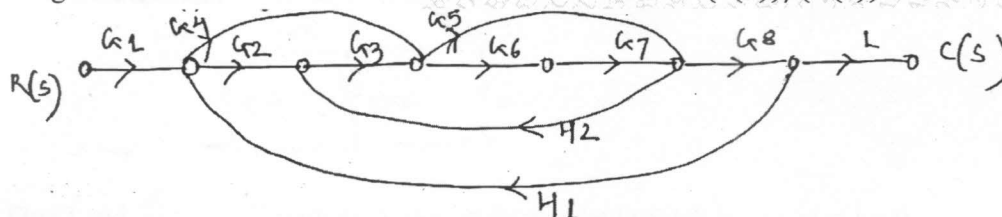
4

- (a) Explain the components of analog data acquisition system 05
- (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 05
- (c) Explain in detail the working principal of LVDT with neat diagram and explain its application 10

5

- (a) Using Mason's Gain formula evaluate the transfer function $(c(S))/(R(s))$ 10



- (b) Explain the working principle of Q meter Mention the sources of errors in Q meter 10

6

- (a)
- (i) Explain multiplexing and discuss any one multiplexing system 05
- (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 05
- (i) Draw and explain the working of capacitive transducer for pressure measurement 05
- (ii) How stability of the system can be analyzed using Nyquist criterion 05
-