

Total No. of Questions : 4]

SEAT No. :

PD19

[Total No. of Pages : 3

[6409]-212

S.E. (Electronics/Electronics & Telecommunication/Electronics & Communication Advanced Communication Technology/ Electronics Engineering (VLSI) Design & Technology) (Insem)

CONTROL SYSTEMS

(2019 Pattern) (Semester - IV) (204192)

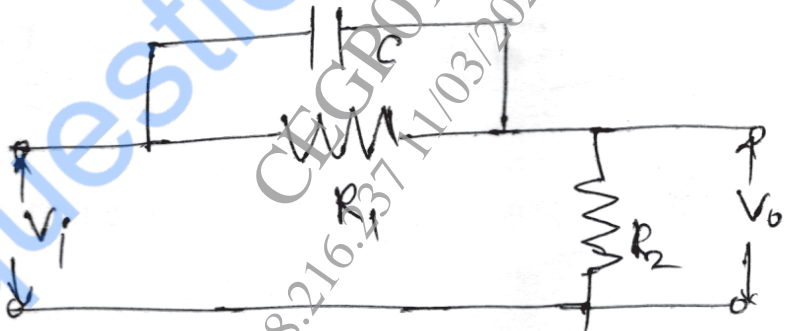
Time : 1 Hour]

[Max. Marks : 30

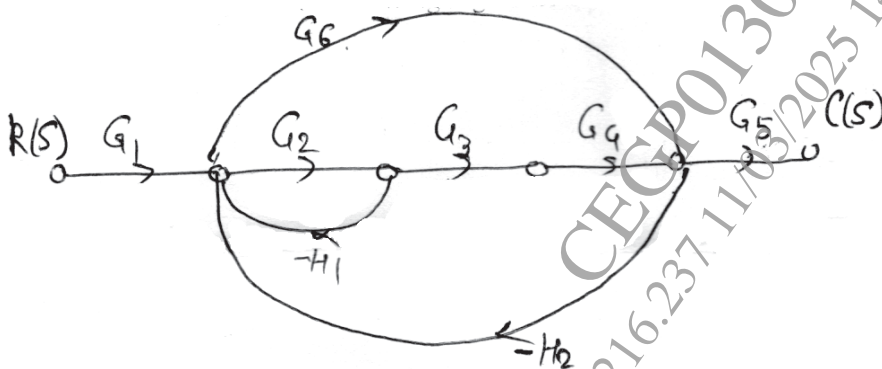
Instructions to the candidates:

- 1) Answer Q1 or Q2, Q3 or Q4.
- 2) Figures to the right indicate full marks.
- 3) Assume suitable data, if necessary.

- Q1) a) Explain Concept of Transfer function? What are the conditions to use transfer function approach? [4]
- b) Calculate Transfer function of following electrical network. [5]



- c) Calculate Masson's Gain of following signal flow Graph $C(S)/R(S)$ [6]

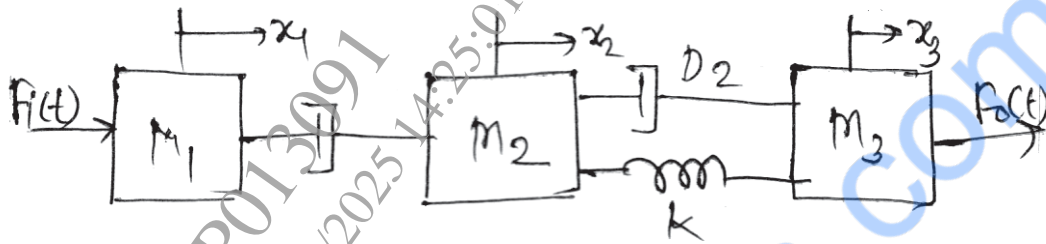


OR

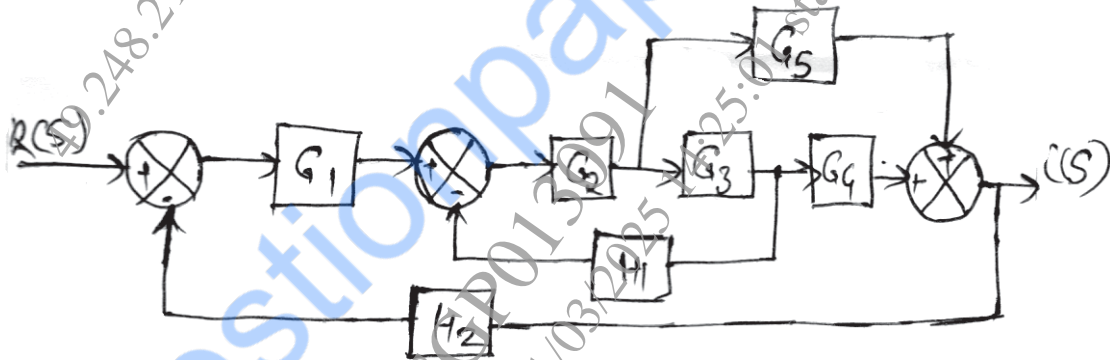
P.T.O.

Q2) a) Write Torque-Current analogy [4]

b) Calculate Transfer function of following Mechanical Network [6]



c) Reduce the given block Diagram using Block Diagram reduction rule and calculate Transfer function. [5]



Q3) a) Sketch the transient response of second order control system and explain with specification. [4]

b) The open loop transfer function of the system is [6]

$$G(S) = \frac{100(S+2)}{S(S+5)(S+10)} \quad H(S) = 1$$

Determine static error constants and steady state error if input is $r(t) = 1+t$.

c) A control system is described by the differential equation.

$$\frac{d^2 y(t)}{dt^2} + 7 \frac{dy(t)}{dt} + 12y(t) = 12x(t).$$

Find its output response for unit step input. [5]

OR

Q4) a) Explain Type and Order of the System [4]

b) A control system is described by the differential equation

$$\frac{d^2 y(t)}{dt^2} + 8 \frac{dy(t)}{dt} + 16y(t) = 16x(t).$$

Find Transfer function and Calculate Time Domain Specifications of the said Control system. Put Your comments. [6]

c) For a Control System Shown in the figure below, find the value of K_1 and K_2 so that $M_p = 25\%$ and $T_p = 4$ sec, assume unit step i/p [5]

