

Total No. of Questions : 4]

SEAT No. :

PA-4962

[Total No. of Pages : 3

[6008]-207

S.E. (Electronics/E & TC) (Insem)

CONTROL SYSTEM

(2019 Pattern) (Semester - II) (Theory) (204192)

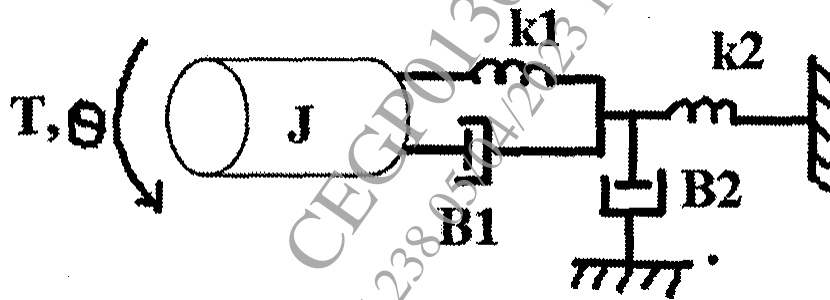
Time : 1 Hour]

[Max. Marks : 30

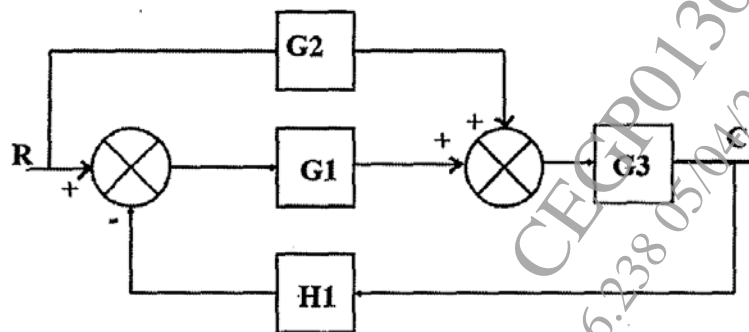
Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4.
- 2) Figures to the right side indicate full marks.
- 3) Assume the suitable data, if necessary.

- Q1) a) Explain open loop and closed loop systems with real time example. [4]
- b) For the given mechanical system find the transfer function. [5]



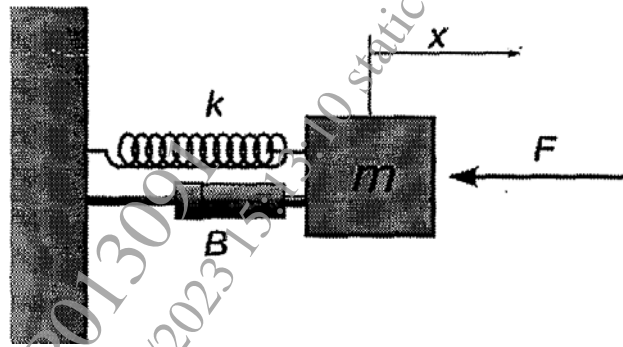
- c) Reduce the following block diagram and obtain the transfer function C/R [6]



OR

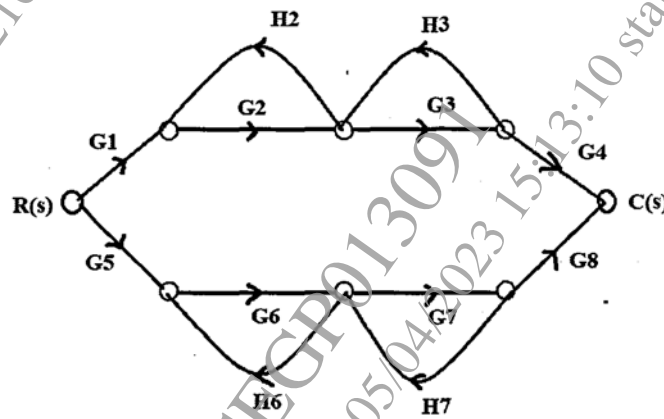
P.T.O.

Q2) a) Determine the transfer function of the given mechanical system. [4]



b) Write the features of closed loop system continuously. [5]

c) Using Meson's gain formula find the transfer $C(s)/R(s)$. [6]



Q3) a) Define the following [4]

i) Peak time

ii) Rise time

iii) Settling time

iv) Delay time

b) A unit step input is applied to the unity feedback system for which open loop transfer function $G(s) = \frac{16}{s(s+6)}$ find closed loop transfer function, natural frequency, damping frequency and damping factor. [6]

- c) For closed loop transfer function, $\frac{G(s)}{R(s)} = \frac{3(s+2)}{(s+4)(s+1)^2}$ of a control system. Find the system response to unit step input. [5]

OR

- Q4)** a) For the following draw the responses, their pole-zero location with mentioning the range of damping factor. [4]

- i) Underdamped
- ii) Overdamped
- iii) Critically damped
- iv) Undamped

- b) The open loop transfer function of the system is $G(s)H(s) = \frac{1000(s+2)}{(s+3)(s+4)}$. Evaluate type of system, error coefficient and also find the steady state error subjected to input $4t$. [6]

- c) A control system is described by the differential equation $\frac{d^2y(t)}{dt^2} + 7\frac{dy}{dt} + 12y(t) = 12x(t)$. Find its output response for unit step input. [5]

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