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)

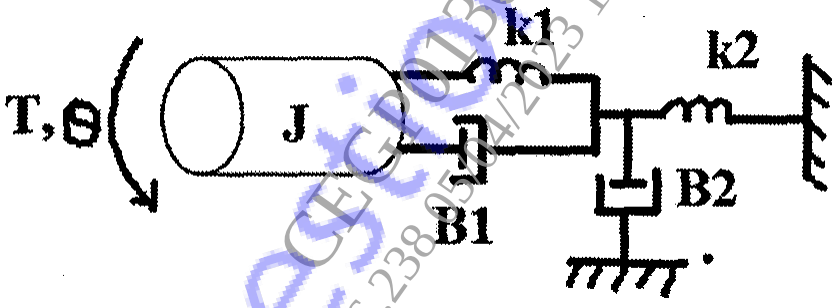
Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

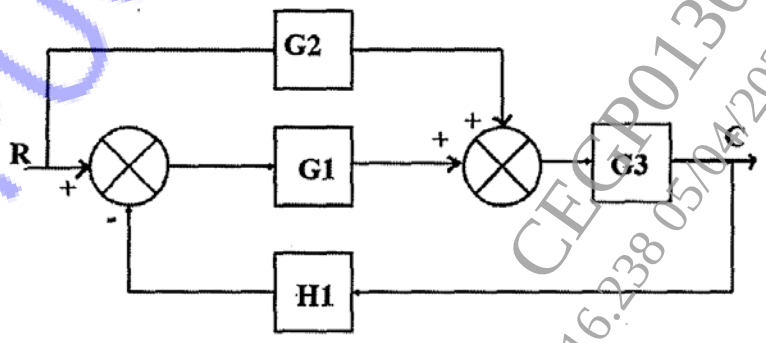
1) ***Answer Q.1 or Q.2, Q.3 or Q.4.***
2) ***Figures to the right side indicate full marks.***
3) ***Assume the suitable data, if necessary.***

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

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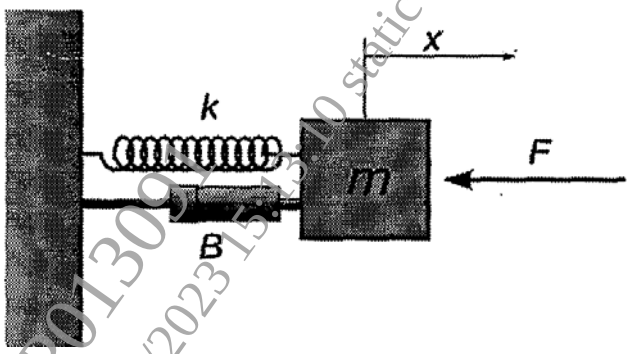
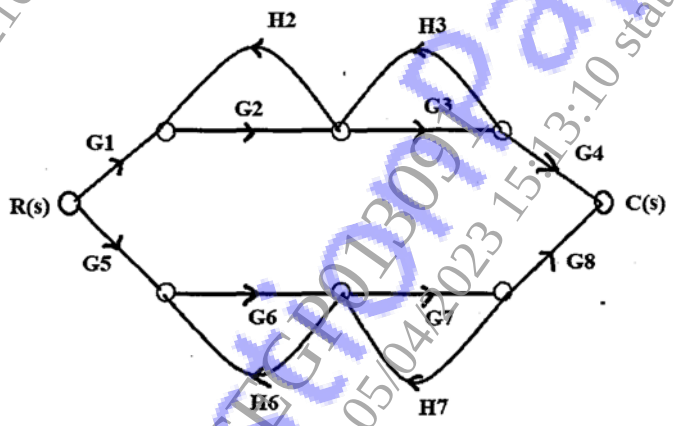
Q2) a) Determine the transfer function of the given mechanical system. **[4]**



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]**

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c) For closed loop transfer function, $\frac{C(s)}{R(s)} = \frac{3(s+2)}{(s+4)(s+1)^2}$ 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 $G(s)H(s) = \frac{1000(s+2)}{(s+3)(s+4)^3}$. 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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