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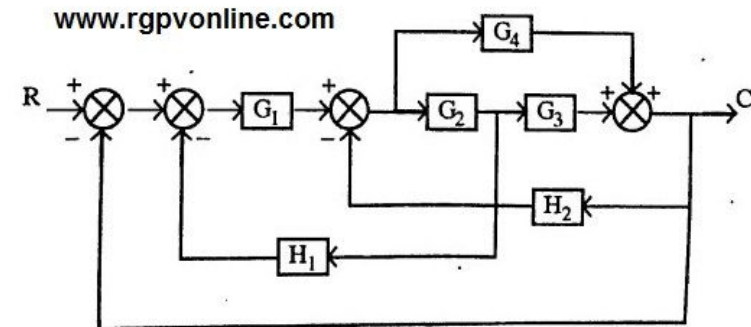
**EE-801****B.E. VIII Semester**  
Examination, June 2017**Control System****Time : Three Hours**

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**Maximum Marks : 70**

- Note:** i) Attempt any five questions.  
ii) All questions carry equal marks.

1. a) Define control system. Differentiate between open loop system and closed loop system with suitable examples. 7  
b) Find the closed loop transfer function using block diagram reduction technique of following one. 7

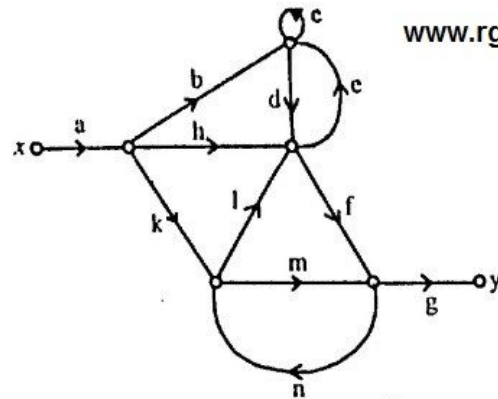


2. a) Derive the overall transfer function relating the output  $\theta(s)$  and the input  $V_a(s)$  for armature controlled d.c. servo motor. Also give relation between torque constant  $K_T$  and back emf constant  $K_b$ . 7

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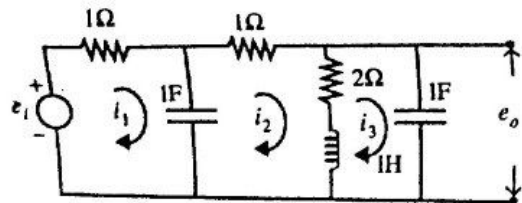
[2]

- b) Determine the transfer function  $y/x$  by Mason's gain formula. 7.



3. a) Derive the expression for second order control system when input is subject to unit step. 7
- b) The open loop transfer function of unity feedback system is given by  $G(s) = K/s(s+1)(s+2)$ . Find the minimum value of K for which the steady state error is less than 0.1 for unit ramp input. 7

4. a) For the network shown in figure. Obtain the state model of the system. www.rgpvonline.com
- b) Find the eigen value of the above system.
- c) And comment on stability. 14



[3]

5. a) Discuss the effect of adding a pole and a zero on root loci. 7
- b) The open loop transfer function of a control system is given by  $G(s)H(s) = \frac{K}{s(s+6)(s^2+4s+13)}$  sketch the root locus. And state stability condition. 7

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6. For a unity feedback system  $G(s) = \frac{800(s+2)}{s^2(s+10)(s+40)}$  sketch the bode plot, and comment on stability. 14
7. A unity feedback control system has  $G(s) = 10/s(s+1)(s+2)$ . Draw Nyquist plot and comment on closed loop stability. 14

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8. Write short notes (any two) 2x7=14
- a) Compensation in control system
- b) A.C. Servo motors
- c) Different types of controllers
- d) Synchros

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