

Roll No. 11EE02030 [Total No. of Pages : 2]

**5E5043**

**B.Tech. V Semester (Main /Back) Examination, Nov./Dec. - 2017**

**Electrical and Electronics Engg.**

**5EX3A Control System**

**Common With EE**

Time : 3 Hours

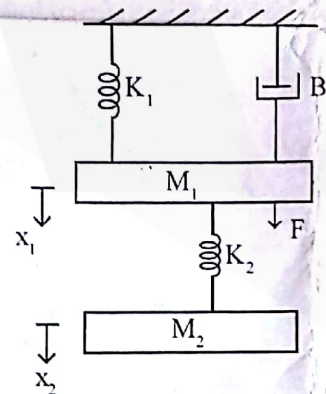
Maximum Marks : 80  
Min. Passing Marks : 26

**Instructions to Candidates:**

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

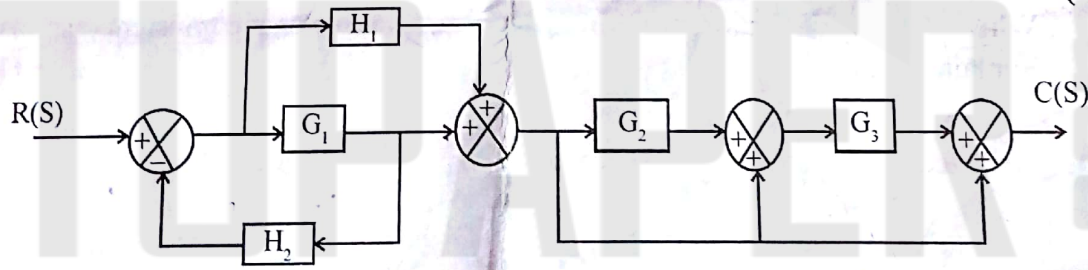
**Unit - I**

1. a) Differentiate between open loop & close loop control systems with suitable example of both. (8)
- b) Draw the force - voltage analogy for the system. (8)



OR

2. Simplify the block diagram and obtain the transfer function relating C(S) & R(S). (16)



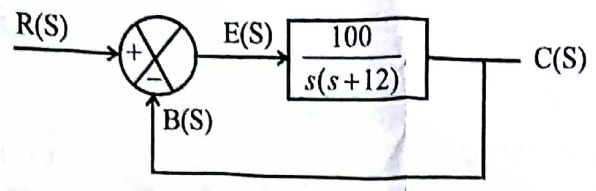
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(1)

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Unit - II

3. a) Perform the time response analysis of First order system with unit step input. (8)  
 b) For the system described in the figure determine the time to reach peak overshoot and its peak overshoot when a unit step signal is applied at input. (8)



OR

4. a) Explain the concept of steady state error and error constants. (8)  
 b) For unity feedback system whose open loop transfer function is

$$G(S) = \frac{50}{(1+0.1s)(1+2s)}$$

Find position, velocity and acceleration error constants. (8)

Unit - III

5. a) Explain the importance of control system components. (8)  
 b) Explain the principle of operation of Tachometer. (8)

OR

6. Sketch the root locus plot of unity feedback system with open loop transfer system

$$G(S) = \frac{K}{s(s+2)(s+4)}$$

(16)

Unit - IV

7. Sketch the Bode plot of  $G(S) = \frac{K(s+3)}{s(s+1)(s+2)}$ . (16)

OR

8. Write technical note on : (8×2=16)  
 i) Nicholas chart  
 ii) Gain & Phase Margin

Unit - V

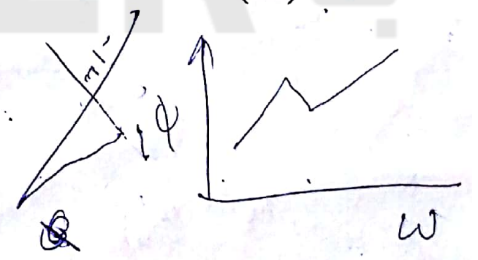
9. Which type of compensator improves the steady state error and transient response? Explain in detail. (16)

OR

10. Write technical note on PID controller. (16)



(2)



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