

**B.Tech. SEM -IV Electronics 2014 Course (CBCS) : WINTER - 2017**

**SUBJECT : INSTRUMENTATION & CONTROL SYSTEM**

Day : **Wednesday**  
Date : **22/11/2017**

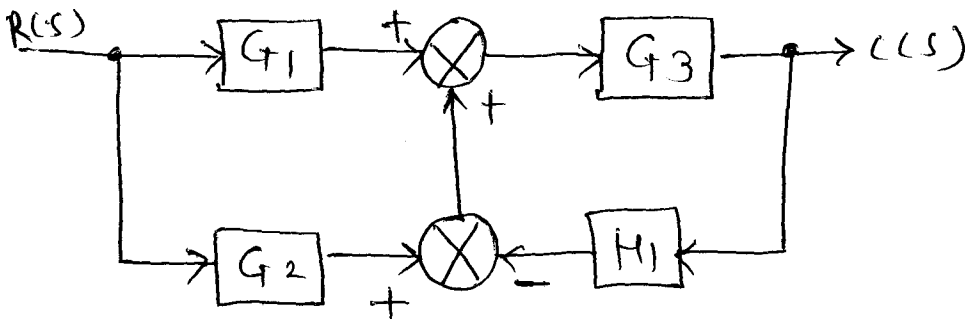
Time : **02.30 PM TO 05.30 PM**  
Max. Marks : **60**

**W-2017-2085**

**N.B.:**

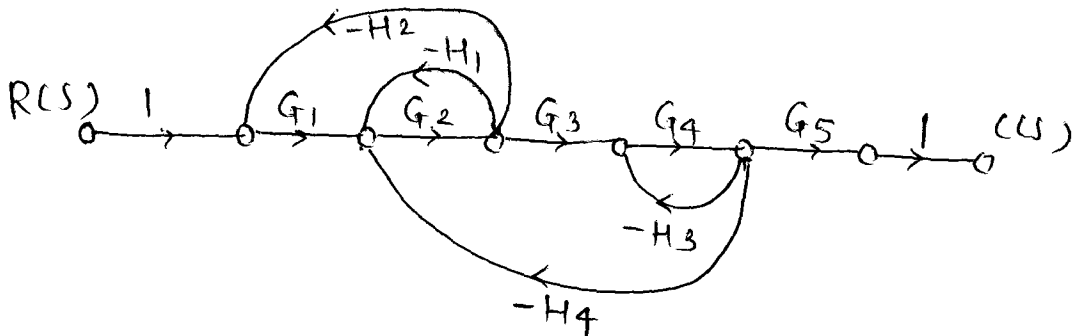
- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of nonprogrammable **CALCULATOR** is allowed.
- 4) Assume suitable data if necessary.

**Q.1** Draw SFG for given block diagram and find transfer function using masson's gain formula. [10]



**OR**

Find  $C(s) | R(s)$  by mason's gain formula. [10]



**Q.2** Discuss the construction and working of capacitive transducer. [10]

**OR**

- a) Describe signal conditioning circuit for RTD. [05]
- b) Define gauge factor and obtain its expression. [05]

**Q.3** A unity feedback system has  $G(s) = \frac{40(s+2)}{s(s+1)(s+4)}$ . [10]

Determine: **i)** type of system **ii)** All error coefficient and error of ramp input with magnitude 4.

**OR**

**P.T.O.**

Draw typical time response for underdamped 2<sup>nd</sup> order system. [10]  
Define: Delay time  $T_d$ , Rise time  $T_r$ , Peak time  $T_p$ , peak overshoot  $M_p$  and setting time  $T_s$ .

Q.4 For a system  $G(s). H(s) = \frac{k(1+s)^2}{s^3}$ , find range of 'k' for system to be stable. [10]

**OR**

Sketch complete root locus of system having [10]  
 $G(s). H(s) = \frac{k}{s(s+1)(s+2)(s+3)}$ .

Q.5 A unity feedback control system has  $G(s) = \frac{80}{s(s+2)(s+20)}$  draw the [10]  
asymptotic bode plot. Determine GM, PM,  $W_{gc}$  and  $W_{pc}$ . Comment on stability

**OR**

Draw polar plot for a system given by  $G(s). H(s) = \frac{10}{s(1+0.1s)(1+0.01s)}$ . [10]  
Find whether the system is stable and if so find GM and PM.

Q.6 Explain working of on-off controller, also define neutral zone. [10]

**OR**

Describe PI with advantages. [10]

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