

**B.Tech. SEM -V Bio Medical 2014 Course (CBCS) : WINTER - 2018**  
**SUBJECT: INSTRUMENTATION AND CONTROL SYSTEM**

Day: Thursday  
 Date: 22/11/2018

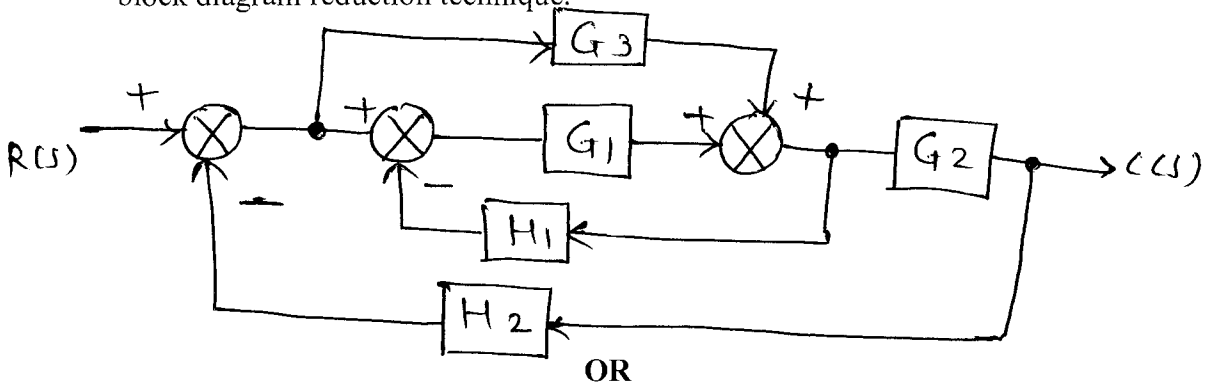
**W-2018-2430**

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

**N.B:**

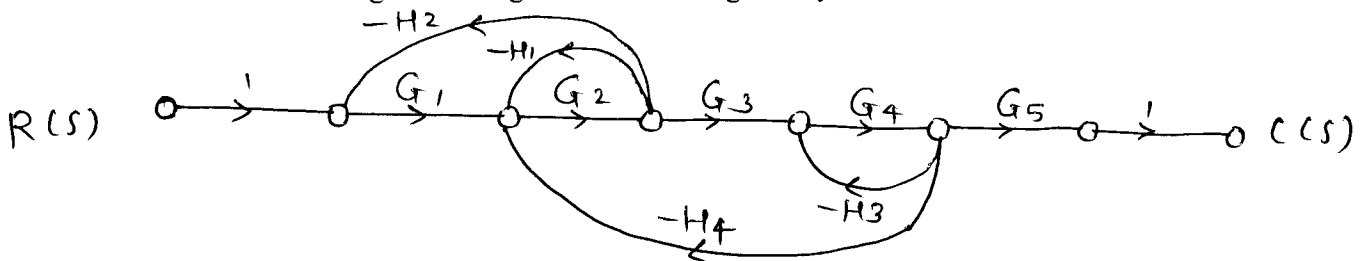
- 1) All questions are **COMUPLSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Assume suitable data if necessary.

**Q.1** Write block diagram reduction rules. Also find the transfer function using block diagram reduction technique. **(10)**



**OR**

**Q.1** Differentiate between open loop and closed loop system. Find transfer function using mason's gain formula for given system. **(10)**



**Q.2 a)** Describe construction and working of synchros. **(05)**

**b)** What is residual voltage? Draw and label construction of LVDT in details. **(05)**

**OR**

**Q.2** Describe construction and working of Electromagnetic flow meter. **(10)**

**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**

**Q.3** For unity feedback system with  $G(s) = \frac{500}{s(s+15)}$  **(10)**

Calculate  $W_n$ ,  $W_d$ ,  $\xi$ ,  $T_d$ ,  $T_p$ , and  $\% M_p$ ,  $T_s$ .

**P.T.O.**

**Q.4** Determine the stability of system whose characteristic equation is given by  $2s^5 + s^4 + 6s^3 + s + 1 = 0$ . (10)

**OR**

**Q.4** Sketch the root locus for the system having  $G(s)H(S) = \frac{K}{s(s+5)(s+10)}$  (10)  
Comment on stability.

**Q.5** State and explain nyquist stability criteria. (10)  
**OR**

**Q.5** For a system having open loop transfer function (10)  
 $G(s)H(S) = \frac{10}{s(s+1)(s+10)}$   
Determine stability of the system by plotting Bode plot of system.

**Q.6** Describe proportional (P), Integral (I), and derivative (D) control action in detail. (10)

**OR**

**Q.6** Describe PLC in detail. Also write its applications. (10)

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