

**B.Tech Sem - III (2007 Course) (Electronics) : SUMMER - 2019**  
**SUBJECT : FUNDAMENTALS OF INSTRUMENTATION AND CONTROL**

Day : Monday  
 Date : 13/05/2019

S-2019-2980

Time : 02.30 PM TO 05.30 PM  
 Max. Marks : 80

**N.B.**

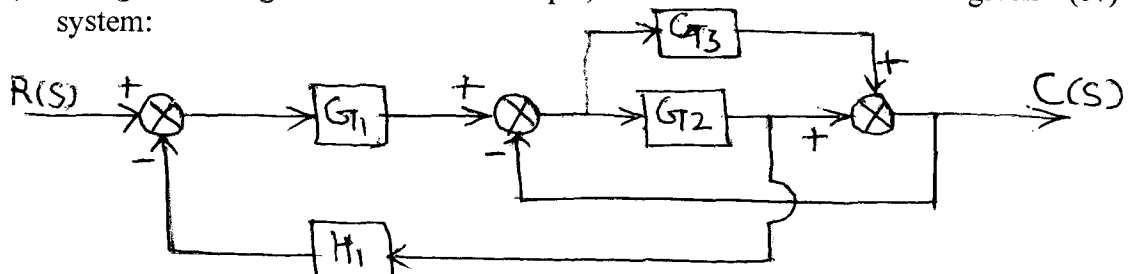
- 1) **Q. No. 1 and Q. No. 5 are COMPULSORY.** Out of remaining attempt **ANY TWO** questions from each section.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SAME** answer books.
- 4) Draw neat and labelled diagram **WHEREVER** necessary.
- 5) Use of non-programmable calculator is **ALLOWED**.
- 6) Assume suitable data, if necessary.

**SECTION - I**

- Q. 1** a) State and explain Mason's Gain Formula. (05)  
 b) Derive expression for steady state error. (05)  
 c) Draw the real axis loci and angle of asymptotes for: (04)

$$G(s)H(s) = \frac{k}{s(s+6)(s+9)}$$

- Q. 2** a) Using block diagram reduction technique, obtain Transfer function for given system: (07)



- b) Describe feedback and feed forward control system. (06)
- Q. 3** a) Determine stability using Routh's array: (07)

$$G(s)H(s) = \frac{100}{s^4 + 6s^3 + 30s^2 + 60s + 100}$$

- b) Obtain maximum overshoot, peak time, rise time and setting time ( $t_s$ ) for a system given by: (06)

$$G(s)H(s) = \frac{25}{s(s+5)}$$

- Q. 4** Draw Bode plot of system with (13)

$$G(s)H(s) = \frac{10}{s(s+1)(s+5)}$$

and obtain G. M. and P. M.

**P. T. O.**

**SECTION - II**

- Q. 5** a) Describe construction and working of piezo-electric accelerometer. (05)  
b) Write note on synchros. (05)  
c) Describe P and D control action. (04)
- Q. 6** a) Describe construction and working of Electromagnetic flow meter. (07)  
b) Explain construction and working of RTD. (06)
- Q. 7** a) Explain need of signal conditioning. Also draw various signal conditioning circuits. (07)  
b) Draw and explain signal conditioning circuit for temperature transducer. (06)
- Q. 8** Write short notes on: (13)  
a) PID control action  
b) PLC architecture

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