

B.Tech Sem - III (2007 Course) (Electronics) : WINTER - 2018
SUBJECT : FUNDAMENTALS OF INSTRUMENTATION AND CONTROL

Day : Wednesday
 Date : 28/11/2018

W-2018-2715

Time : 10.00 AM TO 01.00 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 **SEPARATE** answer books.
- 4) Draw neat and labelled diagram **WHEREVER** necessary.
- 5) Use of non-programmable calculator is **ALLOWED**.
- 6) Assume suitable data, if necessary.

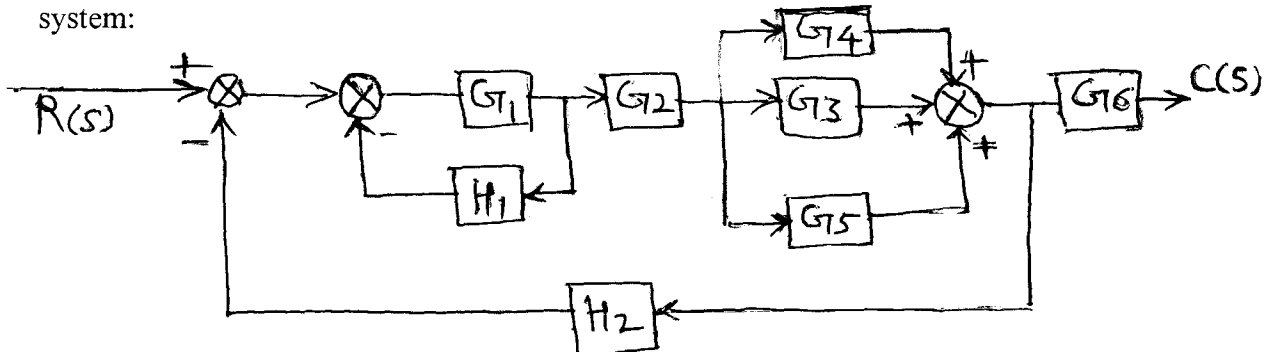
SECTION - I

Q. 1 a) Differentiate between open loop and closed loop system. (05)

b) For $G(s)H(s) = \frac{10(s+1)}{s(s+2)(s+5)}$, (05)
 determine k_p, k_v, k_a and steady state error where $r(t) = 3 + 10t$.

c) Draw the real axis loci For $G(s)H(s) = \frac{k(s+1)}{s(s+2)(s+3)}$ (04)

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



b) State and explain Masson's Gain Formula. (06)

Q. 3 a) Determine the stability of system: (07)

$$s^6 + 2s^5 + 8s^4 + 12s^3 + 20s^2 + 16s + 16.$$

using Routh's array. Also write disadvantages of Routh's criterion.

b) Draw and explain Transient Response specifications. (06)

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

$$G(s)H(s) = \frac{k(s+3)}{s(s+1)(s+2)}$$

P. T. O.

SECTION - II

- Q. 5** a) A resistance of strain gauge with a gauge factor of 2 is cemented to steel member which is subjected to a strain of 1×10^{-6} . If the original resistance value of the gauge is 130Ω . Calculate the change in resistance. (05)
- b) Describe working of synchros. (05)
- c) Write note on PI and PD control action. (04)
- Q. 6** a) Derive expression for Gauge factor of strain gauge. (07)
- b) Describe construction of working of LVDT. (06)
- Q. 7** a) Draw various signal conditioning circuits and describe its working. (07)
- b) Draw and explain signal conditioning circuit for temperature transducer. (06)
- Q. 8** Write short notes on: (13)
- a) On-off control action
- b) PLC

* * * * *