

**B.TECH SEM - III (2007 COURSE) (E & TC ENGG.) : SUMMER -
2018**

SUBJECT: FUNDAMENTALS OF INSTRUMENTATION AND CONTROL

Day: Wednesday
Date: 23/05/2018

S-2018-2597

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

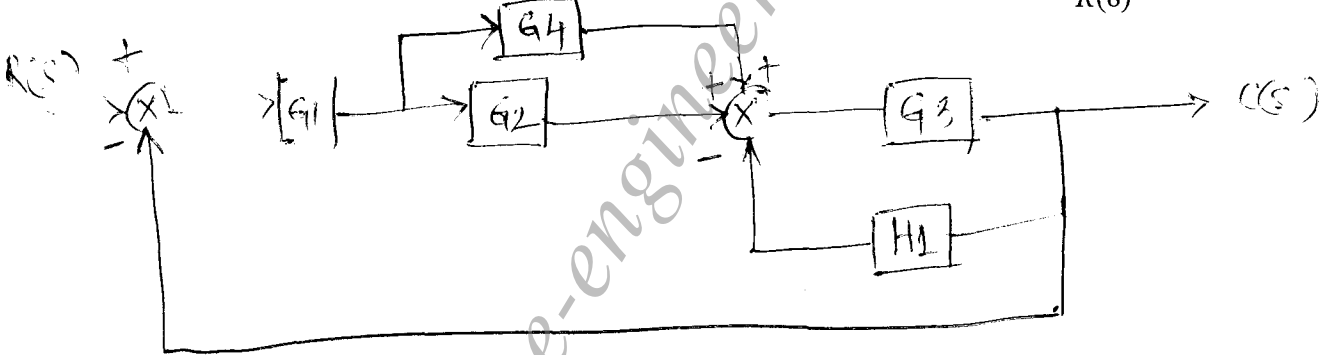
N.B:

- 1) Q. No. 1 and Q. No.5 are **COMPULSORY**. Out of the 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 book.
- 4) Draw neat diagrams **WHEREVER** necessary.
- 5) Use of non- programmable **CALCULATOR** is allowed.

SECTION-I

- Q.1 a) Define:** (07)
- i) Gain Margin
 - ii) Steady state error
 - iii) Order of system

- b) Using block diagram reduction technique to find transfer function $\frac{C(s)}{R(s)}$** (07)



- Q.2 a) If $G(s).H(s) = \frac{20}{s(1+4s)(1+s)}$,** (07)

Determine K_p , K_v , K_a and steady state error for input $2 + 4t + \frac{t^2}{2}$.

- b) Define transfer function. Differentiate between feed forward and feedback control system. Give real time examples of each type of system.** (06)

- Q.3 a) State and explain Routh's stability criterion.** (06)

- b) Define steady state error. Derive the expression for static error coefficient and steady state error for type-2 system for following inputs:** (07)
- i) Unit Step
 - ii) Unit Ramp

- Q.4 Draw a lode plot for a system given by,** (13)

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

Also obtain G.M. and P.M.

P.T.O.

SECTION-II

- Q.5** a) Write principle, construction and working of Thermocouple. Also compare it with RTD. (07)
- b) Compare relay logic and PLC. (04)
- c) What is need of signal conditioning? (03)
- Q.6** a) Explain construction and working of LVDT. (07)
- b) What is Piezo- electric effect? Explain Piezo-electric type accelerometer. (06)
- Q.7** a) Write a note on Instrumentation amplifier. (06)
- b) Explain the use of inverting and non-inverting amplifier as a signal conditioning circuit for electromagnetic type flow meter. (07)
- Q.8** a) Explain PID control action. (06)
- b) Draw block diagram of PLC and explain it. (07)

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