B.TECH. SEM -IV ELECTRONICS 2014 COURSE (CBCS) :
SUMMER - 2018
SUBJECT : INSTRUMENTATION & CONTROL SYSTEM

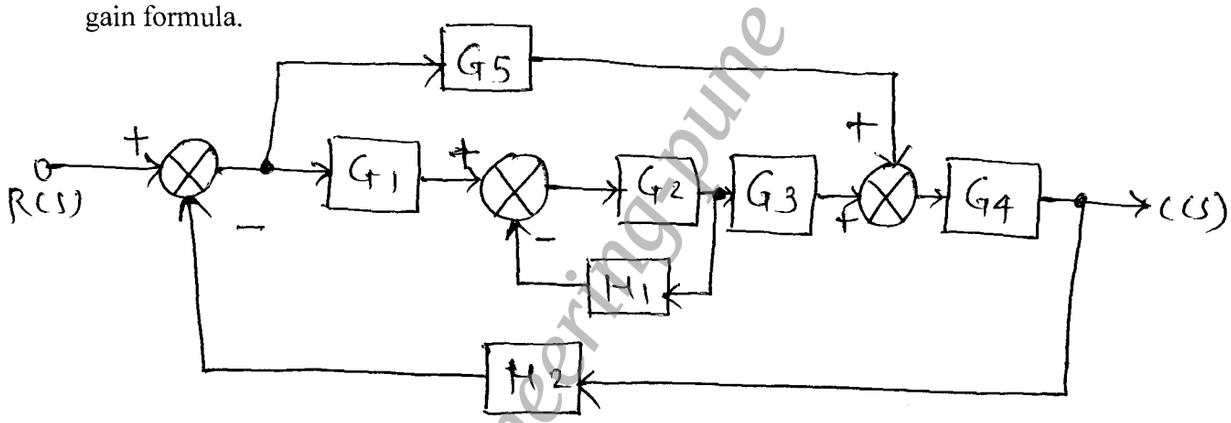
Day : **Thursday** Time : **10.00 AM TO 01.00 PM**
Date : **07/06/2018** Max. Marks : 60

S-2018-2293

N.B.:

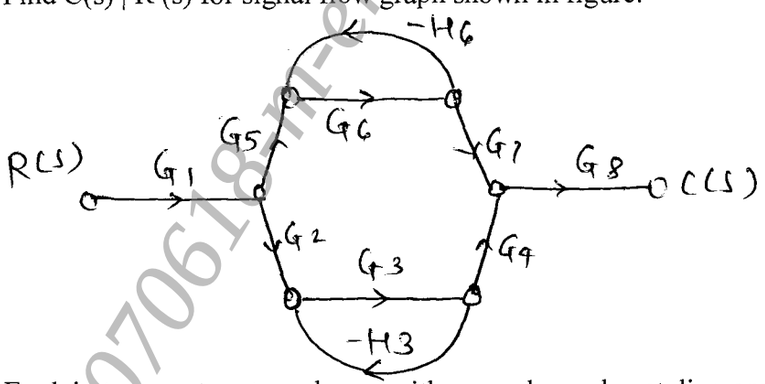
1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Use of nonprogrammable **CALCULATOR** is allowed.
4) Assume suitable data if necessary.

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



OR

Find C(s) | R (s) for signal flow graph shown in figure.



Q.2 Explain temperature transducers with examples and neat diagram. **[10]**

OR

a) Differentiate between following with suitable example: **[05]**
i) Active and passive transducer
ii) Primary and secondary transducer

b) List the advantages of capacitive transducer. **[05]**

Q.3 Define steady state error. Derive the expression for static error coefficients and steady state error for type – 2 system for (i) unit step (ii) unit ramp. **[10]**

OR

P.T.O.

A unity feedback system has $G(s) = \frac{k}{s(s+1)(1+0.4s)}$ if r(t) = 4t and k = 2. **[10]**

Find steady state error.

Q.4 For a system with characteristics equation **[10]**
$F(s) = s^6 + 3s^5 + 4s^4 + 6s^3 + 3s + 2 = 0$ examine stability.

OR

Sketch root locus for system with $G(s).\ H(s) = \frac{k(s+4)}{s(s^2+2s+2)}$. **[10]**

Q.5 A unity feedback control system has $G(s) = \frac{100}{s(s+0.5)(s+10)}$. **[10]**

OR

Draw polar plot for a system given by $G(s).\ H(s) = \frac{100}{s(s+2)(s+4)(s+8)}$ **[10]**
find whether the system is stable and if so find GM and PM.

Q.6 **a)** Design ladder diagram of PLC for equation y = (A + B) . CD. **[05]**

b) Design ladder diagram of PLC for Y = AB + AC + BC. **[05]**

OR

Describe PI and PID control action. **[10]**

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