

GUJARAT TECHNOLOGICAL UNIVERSITY
DIPLOMA ENGINEERING – SEMESTER – IV • EXAMINATION – WINTER • 2014

Subject Code: 3341701**Date: 26-11-2014****Subject Name: Control Instrumentation System****Time: 02:30 pm - 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. English version is considered to be Authentic.

- Q.1** (a) Compares open loop system with closed loop system. **07**
 (b) Give rules for block diagram reduction. **07**
- Q.2** (a) Draw and explain Standard test signals with their equations. **07**
 (b) Derive transfer function for given figure-1 using signal flow graph. **07**
- OR
- (b) Prepare table for analogous quantities in force- torque and voltage analogy. **07**
- Q.3** (a) Determine stability of given characteristic equation using Routh-Hurwitz criteria **07**
 $2S^4 + 2S^3 + 8S^2 + 4S + 3 = 0$
 (b) State the rules for construction of Root Locus. **07**
- OR
- Q.3** (a) Describe steady state error and error constant of control system for step, ramp, parabolic input and type-0, 1, 2 systems. **07**
 (b) Classify control system stability according to location of the roots (poles) of characteristic equation. **07**
- Q.4** (a) Describe concept of Polar plot in brief. **07**
 (b) (i) Define Gain Margin and Phase Margin. **03**
 (ii) Explain Two position control action. **04**
- OR
- Q.4** (a) Obtain mathematical model for series RLC circuit. **07**
 (b) Describe concept of Nyquist stability criteria in brief. **07**
- Q.5** (a) Explain time response of 1st order system with unit step input. **07**
 (b) Define feed forward, cascaded control and Split range control. **07**
- OR
- Q.5** (a) Sketch output for P, I, P+I mode of control action for step input. **07**
 (b) Draw time response of second order system with unit step input and define following terms- delay time t_d , rise time t_r , peak time t_p , maximum overshoot M_p and settling time t_s . **07**

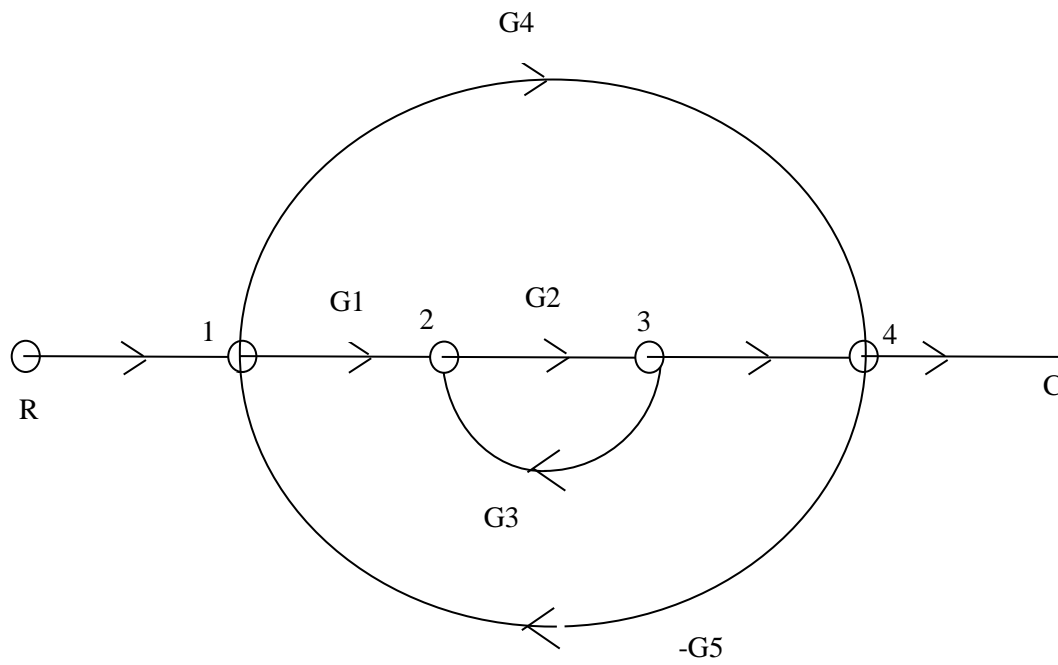


Figure • 1
