Enrolment No.\_\_\_\_

## GUJARAT TECHNOLOGICAL UNIVERSITY M. E. - SEMESTER – I • EXAMINATION – WINTER 2012

Sub	ject	code: 711603N Date: 12-01-2013	
Sub	ject	Name: Computerized Process Control	
Time: 02.30 pm – 05.00 pm Total Marks: 7			
Inst	truct	tions:	
	1. 2. 3	Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks	
Q.1	(a)	Explain the basic concepts of measurement and discuss the generalized measurement system.	07
	<b>(b)</b>	Describe Principle, Working & Mechanism of Proportional-Integral controller.	07
Q.2	(a)	Explain & Discuss about Back-up concept of D D C with diagram.	07
	<b>(b)</b>	Explain with a block diagram the computer control of distillation column. OR	07
	<b>(b)</b>	Explain with a block diagram the computer control of heat exchanger.	07
Q.3	(a) (b)	Discuss Non-interacting multi capacity control system. Explain & discuss the communication in DCS system and describe about CSMA/CD Protocol.	07 07
		OR	
Q.3	<b>(a)</b>	Explain Distributed Computer Control System with a block diagram and Discuss its advantages & disadvantages.	07
	<b>(b)</b>	Describe the Servo & Regulator Control System	07
Q.4	(a)	Determine the transfer function $C(s) / R(s)$ for the system shown in figure below:	07



(b) Explain and discuss Bode diagram for the second order system. 07

- Q.4 (a) List out the factors which have contributed to the development of modern automation 07 technology & discuss in detail about Standardization of Data Communication links & Networks.
  - (b) Discuss the advantages of Digital Computer Control.

-----P.T.O.-----

Q.5 Explain the Root-Locus method in brief. Sketch the root-locus diagram for the 14 system having open-loop transfer function

07

$$G(s) = \frac{K_C(0.5s+1)}{s(s+1)(s+0.5)}$$

Indicate all poles, Zero, Center of gravity, Breakaway point, direction where loci travels. Determine the value of  $K_c$  for which the system becomes just unstable.

## OR

- Q.5 (a) A proportional controller having Kc = 6 is used to control two first order noninteracting system having time constants 1 and 0.6. A unit step change introduced into the set point of the control system. Determine the maximum value of the response and the offset.
  - (b) Discuss about the Working Principle of Thermocouple.

07

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