Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – WINTER 2012

Subject code: 711603N Date: 12-01-2013

Subject Name: Computerized Process Control

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.**

Q.1 **(a)** Explain the basic concepts of measurement and discuss the generalized measurement system. **07**

(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) Explain with a block diagram the computer control of distillation column. **07**

OR

(b) Explain with a block diagram the computer control of heat exchanger. **07**

Q.3 **(a)** Discuss Non-interacting multi capacity control system. **07**

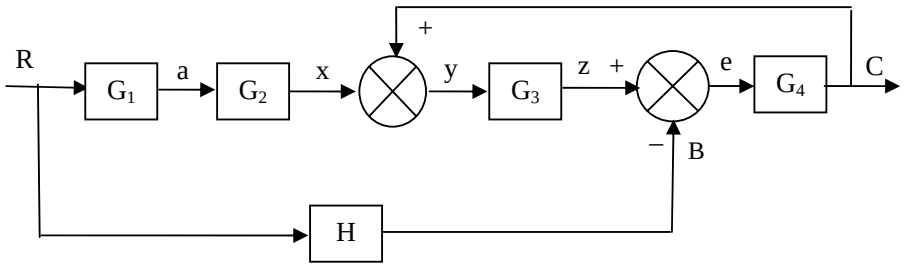
(b) Explain & discuss the communication in DCS system and describe about CSMA/CD Protocol. **07**

OR

Q.3 **(a)** Explain Distributed Computer Control System with a block diagram and Discuss its advantages & disadvantages. **07**

(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**

OR

Q.4 **(a)** List out the factors which have contributed to the development of modern automation technology & discuss in detail about Standardization of Data Communication links & Networks. **07**

(b) Discuss the advantages of Digital Computer Control. **07**

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

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

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

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 non-interacting 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. **07**

(b) Discuss about the Working Principle of Thermocouple. **07**

****