GUJARAT TECHNOLOGICAL UNIVERSITY
M.E Sem-I   Examination January 2010

Subject code: 711603   **Subject Name:** **Computerized Process Control**
Date: 25 / 01 / 2010   **Time: 12.00 – 2.30 pm**
                                                                         Total Marks: 60

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Explain Distributed Computer Control System with a block diagram and   **06**
Discuss its advantages & disadvantages.
(b) What is industrial automation? List all and explain any two factors, which   **06**
have contributed to the development of modern automation technology.

Q.2 **(a)** Define transducer & explain the advantages and disadvantages of Electrical   **06**
Transducer.
(b) Explain with a block diagram, the computer control of a Fed-batch   **06**
Fermentor.
OR
(b) Describe with a diagram, the Temperature Control system for Plastic   **06**
Injection Molding process.

Q.3 **(a)** Explain the Transfer function for the second order control system for   **06**
Manometer.
(b) Explain and discuss the digital to analog converter and analog to digital   **06**
converter.
OR
Q.3 **(a)** Discuss Non-interacting multi capacity control system.   **06**
(b) Describe the Operators interface.   **06**

Q.4 **(a)** Determine the transfer function C(s) / R(s) for the system shown in figure below: **06**
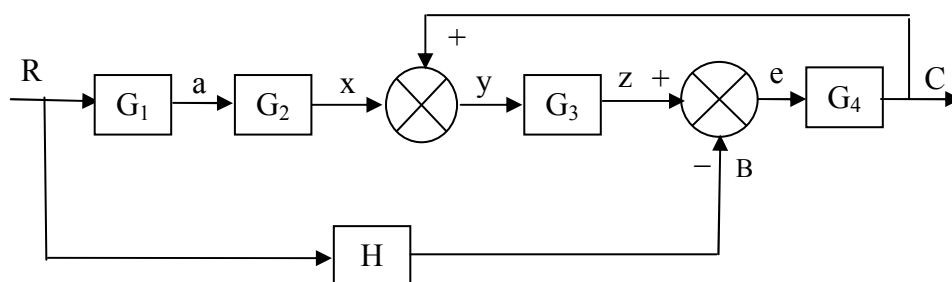
(b) Explain and discuss the Temperature control in CSTR, Chemical unit.   **06**
OR
Q.4 **(a)** A unit step change is given to a PI controller. If the proportional sensitivity   **06**
or gain Kc is 4, the integral time τ_I is 2, obtain the response of the PI
controller.
(b) Explain mechanism and working of Pneumatic control valve.   **06**

Q.5 Explain the Root-Locus method in brief. Sketch the root-locus diagram for **12** the system having open-loop transfer function

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

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) Explain and discuss Bode diagram for the second order system. **06**
(b) Explain the limitations of the Routh test for stability. **06**

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