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KECE/ INST/ VI/ CBGS/ Process Instru^n INST Sys/ 10.5.16

QP Code : 597900

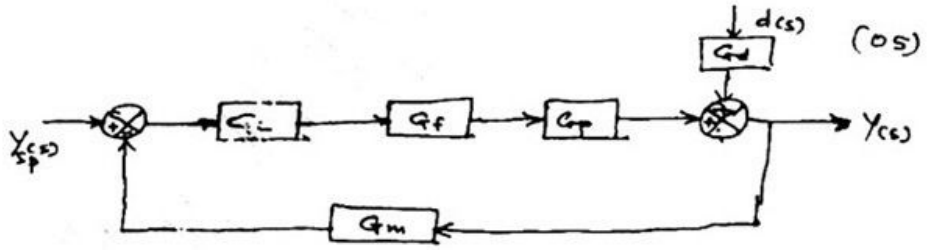
(3 Hours) [Total Marks :80

N.B. : (1) Question no. **1** is **compulsory.**
(2) From Q. No. **2** to Q. No. **6.** Solve any **three.**
(3) **Assume** suitable **data** wherever **necessary**.

1. Answer any **four**:- **20**
   (a) Explain Gain margin and phase margin.
   (b) Compare Batch process and continuous process.
   (c) Explain Reset windup and its significance.
   (d) Explain Override control with an example.
   (e) Explain smith predictor compensator. **muADDA.com**

2. (a) Explain Z-N method for closed loop system for tuning of controllers. **5**
   (b) In an application of Z-N method a process begins oscillation with 30% proportional Band in an 11.5 min. period. Find nominal PID controller settings. **5**
   (c) Explain Electronic PID controller with neat diagram. **10**

3. (a) What is setpoint tracking and disturbance Rejection. Explain with an example **5**
   (b) **5**



   Find equation for Y(s) in terms of Ysp(s) and d(s)
   (c) Explain Relay based tuning technique. What are the advantages over Cohen-Coon technique. **muADDA.com** **10**

4. (a) Explain with an example, What is Interaction? Explain decoupling method used in multivariable control. **10**
   (b) What are the objectives of Adaptive control. Explain Self Tuning Regulator. **10**

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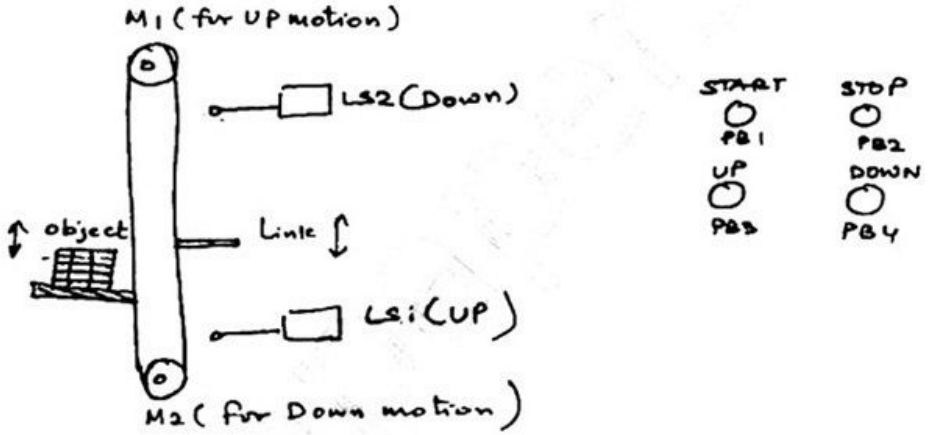
5. (a) Explain feed forward control in detail. Also find equation of controller. Draw feed forward control system for Stirred Tank Heater system. **10**

(b) A 5-m diameter cylindrical tank is emptied by a constant outflow of $1.0 m^3/min$. An on off controller is used to open and close a fill value with an open flow of $2.0 m^3/min$ for level control, the Neutral zone-is 1m and setpoint is 12m. **10**

(i) Calculate cycling period

(ii) Plot level versus time

6. (a) **10**



The Elevator shown in figure above employs a platform to move objects up and down. The objective is when 'UP'Button (PB3) is push the platform carries object to the up position upto LSI(Link on other side of object touches LSI), similarly when DOWN Button is pressed (PB4), the platform carries object down til LS2. M1 and M2 are separate motors used for this operation Process start with START(PBI) pressed and stops with STOP(PB2) pressed.

(b) Explain Inverse response. Also give one example. **10**

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