BE Semester- VI (INSTRUMENTATION AND CONTROL ENGG)
Question Bank

(IC 605 PROCESS CONTROL-I)

All questions carry equal marks(10 marks)

Q.1	Write short note on resistance and capacitance of thermal and Gaseous system in details.
Q.2	When cascade control loop is very useful? How the inner controller can be tuned to get the maximum advantages? Explain cascade controller scheme for distillation column control.
Q.3	What do you mean by process load? Explain magnitude of process load in details.
Q.4	Write short note on optimizing or computing machine control in details.
Q.5	How Zeigler Nichols method is useful in tuning of PID Controller? If a system having a step response of gain K of 2 , delay time of 6 sec, and time constant of 18 sec, find a suitable PID controller for the system.
Q.6	Give the Proportional Integral Derivative (PID) control schematic for a single capacitance liquid level process.
Q.7	What do you mean by distillation condenser? Write short note on condenser controls.
Q.8	Write short note on Batch process control.
Q.9	Explain process degree of freedom and control degree of freedom in details. Find process degree of freedom for liquid to liquid heat exchanger.
Q.10	Explain the working of two element control scheme of a boiler.
Q.11	Write short note on distillation equipment.
Q.12	Explain multi position control in details.
Q.13	Explain self regulation, transient; direct acting controller and nominal load for process.
Q.14	Explain operation of floating point control with neat sketch and necessary Waveforms.
Q.15	Explain operation of PI control with neat sketch and necessary waveforms.
Q.16	Design electronic PID controller with necessary derivations
Q.17	Define proportional band. Design electronic proportional controller and also state its limitations.
Q.18	Explain Zeigler Nicholas method for PI controller tuning.
Q.19	Give the principles governing distillation column. Explain distillation column control with neat sketch
Q.20	Explain feed forward control loop with suitable example and neat sketch
Q.21	Explain any one control scheme for condensation in heat exchangers.
Q.22	Explain three element boiler drum level control with neat sketch.
Q.23	Explain any one scheme for temperature control of superheated steam in boiler.
Q.24	Explain any one control scheme for evaporation in heat exchangers
Q.25	Explain ratio control loop with suitable example and neat sketch.
Q.26	Briefly narrate the occurrence of differential gap in two position controller. Give electronic implementation of two position controller.

Q.27	Give the generalized design procedure of Feedforward Control and show the schematic of it.
Q.28	Write short note on Vapor recompression control in distillation column.
Q.29	How magnitude of process load affects the performance of the control system? Explain with suitable example.
Q.30	What are the different methods available for tuning of PID Controller? Explain relay feedback method in details.
Q.31	Define following term: 1) Transient 2) Process Load 3) Servo response 4) Regulatory response 5) Transport lag
Q.32	Write short note on Evaporation controls.
Q.33	Explain cascade control design criterion? Design cascade control scheme for valve positioner.
Q.34	A PI controller has Kp=4.5 and Ki=7 (second)^-1. Find the controller output for an error given by Ep = 3*Sin(pi*t). What is the phase shift between error and controller output?
Q.35	A proportional derivative controller has a 0.4 to 2.0 Volt input measurement range, a 0 to 5 Volt output, Kp = 4.5 %/% and Kd = 0.07 per (%/minute). The period of the fastest expected signal change is 1.5 s. Implement this controller with Op amp circuits.
Q.36	What are the effects of disturbance on the system? Explain process disturbances in details.
Q.37	Why proportional control action should not be used alone? Give the Proportional (P) control schematic for a single capacitance liquid level process.
Q.38	Why evaporation control is required in chemical process? Explain single effect and multi effect evaporator.
Q.39	Write short note on storage vessel and surge vessel control in details.
Q.40	A furnace has a heating rate of 50 deg per min for full valve opening and a measuring element time constant of 60 sec. The measuring element time constant can be reduced to 20 sec. Would this change be worthwhile if proportional control is used?