2.12 40099 CONTROL SYSTEMS

UNIT-1 SYSTEMS AND REPRESENTATION:

Basic elements in control systems: – Open and closed lop systems – Electrical analogy of mechanical and thermal systems – Transfer function – AC and DC servomotors – Block diagram reduction techniques – Signal flow graphs.

UNIT-2 TIME RESPONSE:

Time response: – Time domain specifications – Types of test input – I and I order system response – Error coefficients – Generalized error series – Steady state error – Rot locus construction- Effects of P, PI, PID modes of feedback control –Time response analysis.

UNIT-3 FREQUENCY RESPONSE:

Frequency response: – Bode plot – Polar plot – Determination of closed lop response from open lop response – Corelation between frequency domain and time domain specifications

UNIT-4 STABILITY AND COMPENSATOR DESIGN:

Characteristics equation – Routh Hurwitz criterion – Nyquist stability criterion- Performance criteria – Effect of Lag, lead and lag-lead compensation on frequency response-Design of Lag, lead and lag lead compensator using bode plots.

UNIT-5 STATE VARIABLE ANALYSIS:

Concept of state variables – State models for linear and time invariant Systems – Solution of state and output equation in controllable canonical form – Concepts of controllability and observabilty.

Reference Books:

1. Control Systems Engineering" by I J Nagrath and M Gopal
2. Automatic Control Systems" by B C Kuo