C 20555

Name..............................

Reg. No...........................

SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, JUNE 2006

EC 2K 601—CONTROL SYSTEMS

Time : Three Hours

Maximum : 100 Marks

Answer **all** *questions.*

I. (a) Differentiate open loop and closed loop systems.

(b) Explain the concept of feedback.

(c) State the advantages of Routh-Hurwitz criterion.

(d) Explain the theory of Nyquist criterion.

(e) Explain the steps of mapping between S plane Z plane.

(f) Define multi-rate sampling. Explain its significance.

(g) Explain the concept of state variables.

(h) Enumerate the properties of state transition matrix.

($8 \times 5 = 40$ marks)

II. (a) (i) State and derive the properties of Laplace transform.

(ii) Derive Mason's Gain formula.

Or

(b) (i) Explain the advantages of block diagram reduction technique with an example.

(ii) Define and explain 'Order and type of filter'.

III. (a) (i) Differentiate continuous time system from discrete time system.

(ii) What is steady state error ? Obtain an expression for it.

Or

(b) (i) Explain the steps to construct root locus.

(ii) Explain in detail the theory of lag-lead compensators.

IV. (a) State and derive the properties of Z transform.

Or

(b) (i) What is pulse transfer function ? Explain. Give an example.

(ii) Give an account on stability analysis using Routh-Hurwitz criterion.

V. (a) (i) What is diagonalization ? Explain.

(ii) What are state space models ? Explain.

Or

(b) (i) Derive the properties of state transition matrix.

(ii) Obtain the relation between Poles and Eigenvalues.

($4 \times 15 = 60$ marks)