C 6261 (Pages : 2) Name.....

Reg. No.....

SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, JUNE 2005

EC 2K 601—CONTROL SYSTEMS

(New Scheme)

Time : Three Hours Maximum : 100 Marks

I. (a) State Mason's gain formula. Explain the terms.

(b) State Initial value and Final value theorem of Laplace transform.

(c) Explain the concept of stability.

(d) Define :

(i) Gain margin.

(ii) Phase margin.

(e) What is sampling ? Explain.

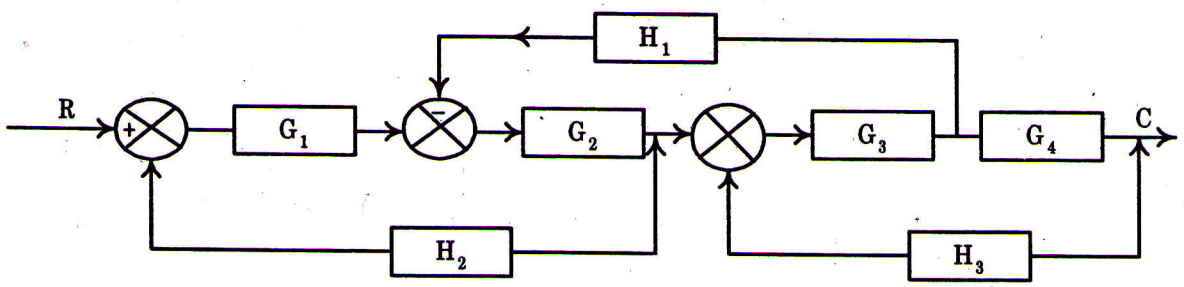
(f) State Jury's criterion.

(g) What is diagonalization ?

(h) List the properties of state transition matrix.

(8 × 5 = 40 marks)

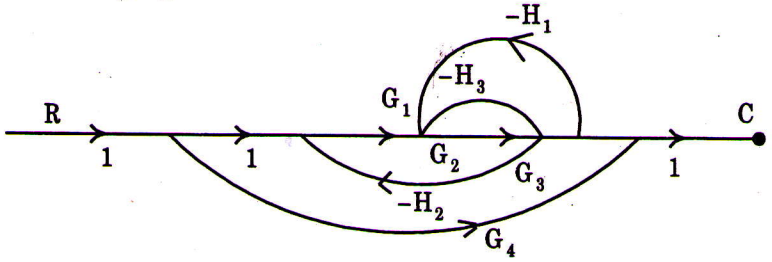
II. (a) Reduce the block diagram shown in Figure below :



(15 marks)

Or

(b) For the signal flow graph shown below find C/R :



(15 marks)

Turn over

III. (a) Explain in detail the construction of bode diagram with an example. (15 marks)

Or

(b) (i) State and explain the significance of Routh-Hurwitz criterion, with an example. (8 marks)

(ii) Give an account on lag-lead compensators. (7 marks)

IV. (a) (i) List and derive all the properties of Z transform. (8 marks)

(ii) Derive the mathematical equations for the sampling process. (7 marks)

Or

(b) (i) Write a note on Bilinear transformation. (8 marks)

(ii) Define and explain cyclic and multirate sampling. (7 marks)

V. (a) (i) Derive the properties of state transition matrix. (8 marks)

(ii) Explain the concept of state variables. (7 marks)

Or

(b) (i) Obtain the relation between transfer function and state space model for continuous cases. (8 marks)

(ii) Explain the significance of state space model. (7 marks)

(4 × 15 = 60 marks)