Code No. 6098 / S

FACULTY OF ENGINEERING

B.E. 3/4 (ECE) I – Semester (Supplementary) Examination, July 2014

Subject : Automatic Control Systems

Time : 3 hours **Max. Marks : 75**

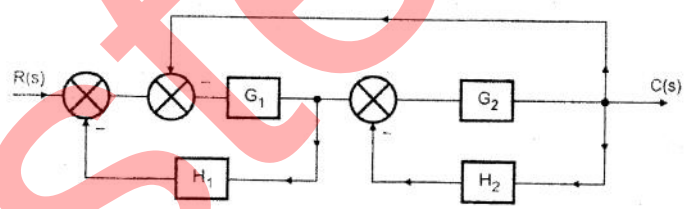
Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1	Write the advantages of an open loop systems give examples.	2
2	Explain the force voltage analogy.	3
3	Write the limitations of transfer function approach.	2
4	State the limitations of Routh's Herwitz criterion for stability.	2
5	Sketch the root locus of a unity feedback control system whose transfer function is k/S^2.	3
6	Give the advantages of Bode plots over Nyquist plot.	2
7	Explain the Nyquist criterion.	3
8	Write the disadvantages of digital control system over analog control system.	3
9	Define controllability and observability.	2
10	Obtain the solution of a state transition matrix.	3

PART – B (50 Marks)

11 Reduce the given block diagram for a given figure and hence obtain the transfer function C(s)/R(s). Veriry it using signal flow graphs.



12 a) A unity feedback system is characterized by the open-loop transfer function. $G(s) = \frac{1}{s(0.5s+1)(0.2s+1)}$. Determine the steady-state errors for unit-step, unit-ramp and unit acceleration input.

b) Explain the error series.

13 A unity feedback system has open loop transfer function $G(s) = \frac{K}{s(s^2+8s+32)}$. Sketch the root Locus. Show all the calculations.

14 Draw the Bode plot for the system having $G(s)H(s) = \frac{100(0.02s+1)}{(s+1)(0.1s+1)(0.01s+1)}$. Find the gain and phase cross over frequency.

15 a) Write the merits of digital control system over analog control system.

b) Explain the Architecture of Digital control system.

16 a) The closed loop transfer function is given by $\frac{Y(s)}{U(s)} = \frac{160(s+4)}{s^3+8s^2+192s+640}$. Obtain the state variable model using signal flow graph.

b) Explain the properties of State transition matrix.

17 Write the short notes on the following :

a) Nyquist criterion b) compensating networks c) servo components.

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