UNIT-III

	QUESTIONS (SHORT)	CO	Cognitive Level
1	What is the relation between dominant roots and settling time?	C214.3	Understand
2	Give the pictorial representation of poles for unstable, limitedly stable and stable systems.	C214.3	Understand
3	Define relative stability.	C214.3	Remember
4	Find the value of K and frequency of oscillations, if a system with CE $s^2+(2K-1)s+1=0$ will sustain oscillations.	C214.4	Understand
5	What is the effect of adding poles to G(s)H(s) on root locus?	C214.4	Understand
6	What is the effect of adding zeros to G(s)H(s) on root locus?	C214.4	Understand
7	The OLTF of a UFB system is given by G(s) $=\frac{Ks(s+2)}{(s-2)(s-3)}$. How many root locus branches are there?	C214.4	Understand
8	The OLTF of a UFB system is given by G(s) $=\frac{K(s+2)}{(s+1)(s-1)}$. How many root loci will terminate on infinity?	C214.4	Understand
	QUESTIONS (ESSAY)	CO	Cognitive Level
1	(a)The characteristic equation of a control system is given by $s^4+20Ks^3+5s^2+(10+K)s+15=0$. Determine the range of values of K for the system to be stable. (b) A certain unity negative feedback system has the open loop transfer function G(s)= $\frac{K(s+1)}{s(s-1)(s+6)}$. Find the value of K which makes the closed loop system lose stability. What are the locations of unstable poles in the s-plane for this value of K?	C214.3	Understand
2	(a)How many roots of a characteristic polynomial of a system s^4-s^2-2s+2 have positive real parts? (b) Determine the value K for which the characteristic polynomial of a system $s^4+8s^3+24s^2+32s+K$ has roots with zero real part.	C214.3	Understand
3	(a) The open loop transfer function of a unity feedback system is given by G(s)H(s)= $\frac{Ke^{-s}}{s(s^2+5s+9)}$. Determine the value of K for the system to be stable. (b) Determine the value of K(K>0) such that the characteristic equation $s^3+3(K+1)s^2+(7K+5)s+(4K+7)=0$ has roots more negative than s=-1.	C214.3	Apply
4	(a) The open loop transfer function of a unity feedback system is given by G(s)H(s)=$\frac{K(s+1)}{(s^3+as^2+2s+1)}$ .Determine the values of K and a, if the system oscillates with a frequency 2 rad/sec. (b) What are the difficulties with Routh criterion? How to overcome them?	C214.3	

	(c) Explain in detail about relative stability.		
5	Explain the rules to construct Root Locus.	C214.4	Remember
6	(a)Consider a feedback system with characteristic equation $1+\frac{k}{s(s+1)(s+2)}$=0. Sketch the root locus when open loop gain is varied from 0 to ∞. (b) The open loop transfer function of a unity feedback system is given by G(s)H(s)=$\frac{K(s+2)(s+1)}{(s+0.1)(s-1)}$. Sketch the root locus when open loop gain K is varied from 0 to ∞.	C214.4	Apply
7	The open loop transfer function of a unity feedback system is given by G(s)H(s)=$\frac{K}{s(s+4)(s^2+4s+20)}$. (a) Sketch the root locus for 0≤K≤∞ (b) At what value of K does the system become unstable? (c) What is frequency of sustained oscillations of the system when it just loses stability?	C214.4	Apply
8	(a)The open loop transfer function of a unity feedback system is given by G(s)H(s)=$\frac{K(s+2)}{(s^2+2s+2)}$. Sketch the root locus when open loop gain K is varied from 0 to ∞. (b) The open loop transfer function of a unity feedback system is given by G(s)H(s)=$\frac{Ke^{-s}}{s(s+2)}$. Sketch the root locus when open loop gain K is varied from 0 to ∞.	C214.4	Apply