2008 ANDHRA UNIVERSITY
B.E/B.TECH DEGREE EXAMINATIONS
CONTROL SYSTEM
(ELECTRONICS AND COMMUNICATION ENGINEERING)

TIME: 3 HOUR
MARK: 70

Question No.1 Is Compulsory And Answer Any Other 5 Questions
All Questions Carry Equal Marks

1
a)List the effects of negative feedback on the performance of a system

b)Define the "system sensitivity ". For a good system, should it be high or low ? Explain

c)What is the break away point on the root locus?How do you determine the breaking point?

d)Explain Routh's Hurwithz stability criterion

e)Define the gain margin and phase margin of a closed loop control system

f0Distinguish between absolute stability and conditional stability

g)what is the purpose of Nichol' chart?

2)
a)For the given block diagram shown below, determine its transfer function. Use block diagram reduction technique
(a Diagram is given)

b)what are the rules for the construction of signal flow graph?

c)Find for the following system shown below,C/R by using Mason's gain formula
(diagram given)

3)a)what is steady state error? Derive the expressions for static error coefficients Kp,Kv and Ka

b)A unity feedback control system is characterised by an open loop transfer function G(S)=K/s(S+10) Determine the gain K so that the system will have a damping ratio of 0.5 . For this value of 'K',determine settling time, peak overshoot and time to peak overshoot for a step input

4)
a)Determine the stability of the system that has the following characteristic equation whose transfer function is
G(S).H(S)=K(S+3)/S(S+2)(S+4)(S+5)

b)what are the uses of tachometers in control systems?

c)Determine the stability of the system that has the following characteristic equation using R-H criterion
S6+2S5+8s4+17S3+20S2+16s+16=0

5)
a)Discuss the rules of construction of Root locus

b)Sketch the root locus of a system whose open loop transfer function with unity feedback is given by

6)
a)Explain time domain specifications of a control system

b)The open-loop transfer function of a unity feedback control system is
G(S)=100?S(1+0.002S) Draw the Bode plots and from them calculate the phase margin and gain margin of the system

7)
a)Apply Nyquist criterion to determine the stability of the system with $G(S).H(S)=7(S-1)/(S-2)(S-4)$

b)Draw the polar plots of the system whose

i)$G(S).H(S)=1/S(1+S?)$

ii)$G(S).H(S)=S$

8)write short notes on the following

a)merits and demerits of a.c and d.c seromotors

b)M and N circles

c)Frequency domain specifications of control system tricks