Reg.No. _____

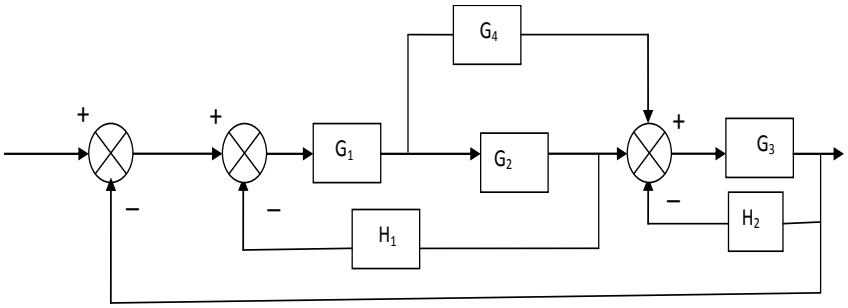
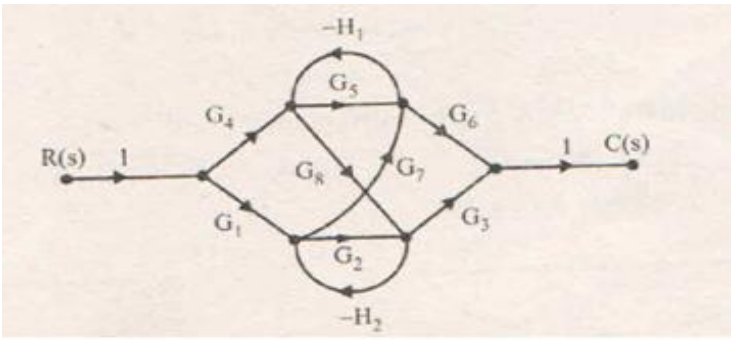
Karunya UNIVERSITY

(Karunya Institute of Technology & Sciences)
(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

End Semester Examination – April/May – 2017

Code : 15EI2006 **Duration : 3hrs**
Sub. Name : Bio Control Systems **Max. marks : 100**

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	Compare the features of engineering and physiological control systems with examples.	CO1	10
	b.	Determine the overall transfer function of the system C(s)/R(s). 	CO1	10
		(OR)		
2.	a.	Derive the transfer function for field controlled DC motor.	CO1	10
	b.	Using Mason's gain formula, determine the overall gain of the system shown below 	CO1	10
3.	a.	What are the time domain specification? Wrote short notes on them.	CO2	10
	b.	Obtain the response of undamped second order system for unit step input.	CO2	10
		(OR)		
4.	a.	A unity feedback control system has an open loop transfer function G(s)=10/s(s+2). Find the rise time, percentage over shoot, peak time and settling time.	CO2	10
	b.	Obtain the mathematical model of chemical regulation of ventilation.	CO3	10
5.	a.	Sketch the root locus of the system whose open loop transfer function is $G(s) = \frac{K}{s(s+2)(s+4)}$.	CO3	20
		(OR)		
6.	a.	Using Routh-Hurwitz criterion determine the stability of the system represented by the characteristic equations. $s^5+s^4+2s^3+2s^2+3s+5 = 0$. Comment on the location of the roots of the characteristic equation.	CO3	15
	b.	Enumerture the fetaures of frequency response analysis.	CO2	5
7.	a.	Sketch the bode plot for the following transfer function.	CO2	20

		$G(s) = 75(1+0.2s)/s(s^2 + 16s +100)$		
		(OR)		
8.	a.	The open loop transfer function of a system is given by $G(s) = 1/s(1+s)(1+2s)$. Sketch the polar plot and determine gain margin and phase margin.	CO2	20
		Compulsory:		
9.	a.	Explain the concept of stretch reflex with respect to control system concept**.**	CO3	10
	b.	Obtain the mathematical model for the regulation of cardiac output**.**	CO3	10

ALL THE BEST