U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

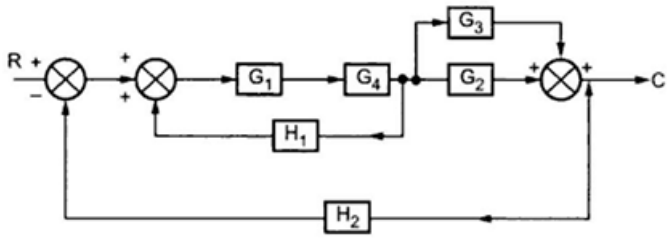
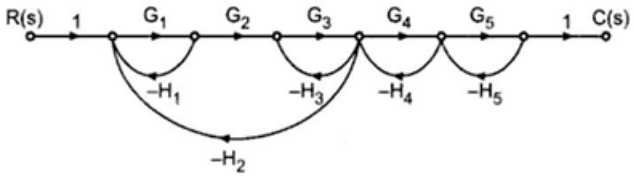
Autonomous Institute Affiliated to VTU

August 2024 Semester End Main Examinations

Programme: B.E. **Semester: IV**
Branch: Medical Electronics Engineering **Duration: 3 hrs.**
Course Code: 23MD4ESPCS **Max Marks: 100**
Course: Physiological Control Systems

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			MODULE - I	CO	PO	Marks
1	a)		Determine the transfer function C(s) / R(s) of the system shown in the Figure 1. (a)  **Figure 1. (a)**	CO1	PO3	**10**
	b)		Find $\frac{C(s)}{R(s)}$ for the Figure 1. (b)  **Figure 1. (b)**	CO1	PO3	**10**
			OR			
2	a)		How would you substantiate that muscle stretch reflex provides a good example of negative feedback in physiological control system?	CO2	PO1	**10**
	b)		Describe the mathematical formulation that characterize the input output properties of linearized model of muscle mechanics.	CO2	PO1	**10**
			MODULE - II			
3	a)		Illustrate the schematic representation of the processes involved in the regulation of glucose and insulin. Brief the steady state analysis of glucose regulation under normal condition, Type-1 diabetes and Type-2 diabetes.	CO2	PO2	**12**

		b)	Summarize the importance of cardiac output curve considering the factors that affect slope and position and factors that affect only position.	*O2*	*PO2*	**08**
			MODULE - III			
	4	a)	List the advantages of Routh's criterion.	*CO3*	*PO1*	**06**
		b)	Write the general steps followed to construct root locus.	*CO3*	*PO1*	**08**
		c)	Elaborate the stability analysis of the pupillary light reflex considering a basic scheme of block diagram.	*CO3*	*PO1*	**06**
			MODULE - IV			
	5	a)	Which are the three fundamental problems in system analysis. Explain them with a neat block diagram.	*CO4*	*PO2*	**12**
		b)	Discuss the Kao's cross-circulation experiments.	*CO4*	*PO3*	**08**
			MODULE - V			
	6	a)	Enumerate the steps followed to sketch the bode plot.	*CO3*	*PO3*	**10**
		b)	Specify the general frequency response specifications.	*CO3*	*PO3*	**10**
			OR			
	7	a)	Show the frequency responses of the linearized lung mechanics model.	*CO3*	*PO2*	**10**
		b)	Discuss the frequency response of glucose-insulin regulation.	*CO3*	*PO2*	**10**

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