School of Engineering

Department of Mechanical Engineering
Mid Term Examination

Exam Date: 26 Sep 2023
Time : 90 Minutes
Marks : 50

Sem VII - BME072 - Automatic Control Systems

Your answer should be specific to the question asked
Draw neat labeled diagrams wherever necessary

1)	How does a root locus plot help in control system design?	K2	(2)
2)	Define a non-linear control system and explain how it differs from a linear control system.	K1	(3)
3)	Discuss the solution-time criterion and its significance in optimal control design.	K2	(4)
4)	Define the Ricatti equation in optimal control theory. How is it used to determine optimal control strategies?	K2	(6)
5)	Discuss the concept of optimal control in the context of minimizing a quadratic performance index. How does it lead to improved system performance?	K3	(6)
6)	Evaluate the stability of a control system using both root locus and Nyquist plot methods.	K3	(9)
7)	Compare and contrast the advantages and disadvantages of phase lead and phase lag compensators.	K4	(8)
8)	Evaluate the suitability of the phase plane method for analyzing non-linear systems with limit cycles.	K4	(12)

OR

	Assess the robustness of the describing function method in handling uncertainties and nonlinearities in control systems.	K4	(12)