

23

Supplementary

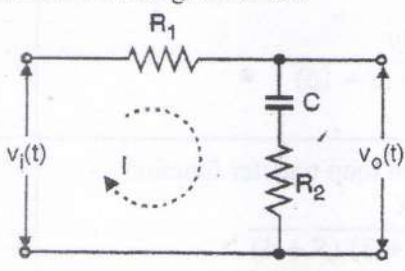
05/02/2025

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

May-June 20 / Nov - Dec 2024 July-Aug 20 / Feb-March 20			Jan/Feb 2025
(B. Tech / M. Tech.) Program: EXTC Scheme I/H/II/III: III			
Regular/ Supplementary Examination: FY/SY/TY/LY Semester: I/II/III/IV/V/VI/VII/VIII			
Course Code: EXC304 Course Name: Electronic Instrumentation & Control Systems			
Date of Exam:	Duration: 02.5 Hours	Max. Marks: 60	

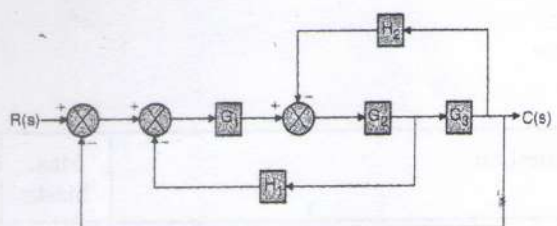
Instructions:

- (1) All questions are compulsory.
- (2) Draw neat diagrams wherever applicable.
- (3) Assume suitable data, if necessary.

Q. No.	Question	Max. Marks	CO	BT level
	Solve any two questions out of three (05 marks each)	10		
a)	Define Accuracy, Precision, Linearity, and Sensitivity with suitable example.	5	1	U
b)	Find the transfer function for the given circuit 	5	3	U
c)	Compare the temperature transducer w.r.t. their characteristics and measurement ranges.	5	2	U
Q 2	Solve any two questions out of three (05 marks each)	10		
a)	Explain concept of relative, absolute, and robust stability.	5	5	U
b)	Write short note on: Steady state error in feedback control system.	5	4	U
c)	Explain relative stability using Gain Margin (G.M.) and Phase Margin (P.M.)	5	6	U
Q.3	Solve any two questions out of three. (10 marks each)	20		
a)	Derive an Expression for resistance measurement using Wheatstone Bridge.	10	1	U

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b)	Using Block diagram reduction techniques, find closed loop transfer function. 	10	3	U
c)	Explain the principle, working, and construction of LVDT. What is meant by residual voltage?	10	2	U
Q.4	Solve any two questions out of three. (10 marks each)	20		
a)	A unity feedback control system has $G(s) = \frac{100}{s(s+0.5)(s+10)}$ Find GM, PM, ω_{gc} , ω_{pc}	10	6	AP
b)	An unity feedback system has the open loop transfer function $G(s) = \frac{K}{s(s+1)(s+3)(s+4)}$ Draw complete root locus and comment over stability	10	5	AP
c)	using Routh-Harwitz criterion for the unity feedback system with open loop transfer function $G(s) = \frac{K}{s(s+5)(s+1)(s+2)}$ find: Range of K, marginal value of K (K_{Mar}), location of poles when system is marginally stable	10	4	AP
