

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

Nov - Dec 2025

B. Tech Program / Electronics and Telecommunication Engineering - Scheme III / II B

Regular Examination SY Semester III

Course Code: EXC304 and Course Name: **Electronic Instrumentation and Control System**

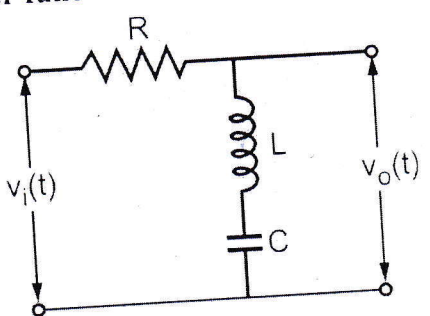
Date of Exam: 29/11/2025

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
Q 1	Solve any two questions out of three: (05 marks each)	10		
a)	List all 10 rules of Block Diagram Reduction, and state the steps to solve the Signal Flow Graph using Mason's Gain Formula.	5	4	U
b)	List Formula for Static Error Coefficients K_p , K_v , K_a , and draw standard test signals with their Laplace transform.	5	5	U
c)	Explain relative stability using Gain Margin (G.M.) and Phase Margin (P.M.)	5	6	U
Q 2	Solve any two questions out of three: (05 marks each)	10		
a)	Define Accuracy, Precision, Linearity, and Sensitivity with suitable examples.	5	1	U
b)	Write the selection criteria of the transducer.	5	2	U
c)	Obtain the transfer function of the given circuit. 	5	3	U

Nov - Dec 2025

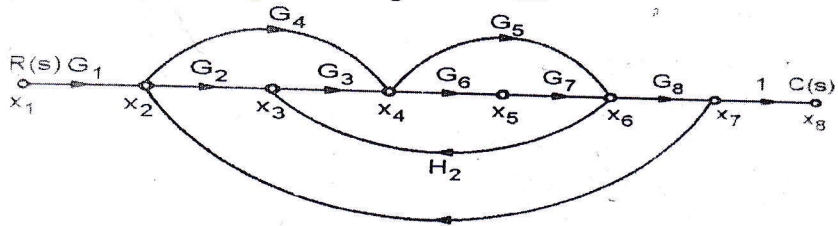
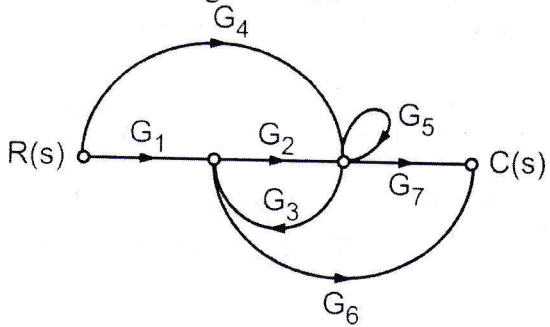
B. Tech Program / Electronics and Telecommunication Engineering - Scheme III / IIB
Regular Examination SY Semester III

Course Code: **EXC304** and Course Name: **Electronic Instrumentation and Control System**

Date of Exam: **29/11/2025**

Duration: **02.5 Hours**

Max. Marks: **60**

Q.3	Solve any two questions out of three. (10 marks each)	20		
a)	Explain the working principle of LVDT with a neat diagram and state its advantages and disadvantages.	10	1	U
b)	Find $C(s)/R(s)$ using Mason's gain formula 	10	2	U
c)	Determine the overall transfer function $C(s)/R(s)$ for the Signal Flow Graph shown in the figure below 	10	3	U
Q.4	Solve any two questions out of three. (10 marks each)	20		
a)	Reduce the following block diagram and obtain the transfer function .	10	4	AP

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

Nov – Dec 2025

B. Tech Program / Electronics and Telecommunication Engineering - Scheme III / ~~III~~ B

Regular Examination SY Semester III

Course Code: **EXC304** and Course Name: **Electronic Instrumentation and Control System**

Date of Exam: **29/11/2025**

Duration: **02.5 Hours**

Max. Marks: **60**

b)	Sketch the root locus of unity feedback system with $G_S = \frac{K}{S(S+5)(S+10)}$	10	5	AP
c)	Construct the Bode plot for the following transfer function $G_{(s)} \cdot H_{(s)} = \frac{100}{S(S+1)(S+2)}$ Find Phase Margin (PM), Gain Margin (GM), Phase crossover frequency (ω_{pc}), and Gain crossover frequency (ω_{gc}).	10	6	AP
