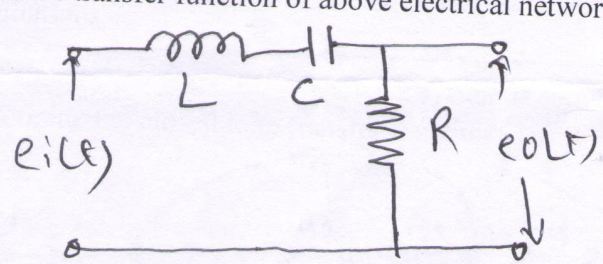


K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

April - May 2023 B. Tech: Electronics and Telecommunication Engineering Examination: SY Course Code: EXC304 and Course Name: Electronic Instrumentation & Control Systems Date of Exam: 01/06/23	Scheme II Semester: III Max. Marks: 60
Duration: 2.5 Hours	

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

		Max. Marks	CO	BT level
Q 1	Solve any six questions out of eight:	12		
i)	Define linearity?	2	1	U
ii)	Define seeback effect .	2	6	U
iii)	Write balance equation for Schering bridge.	2	4	U
iv)	Write centroid formula in root locus.	2	3	U
v)	Define mason's gain formula.	2	4	R
vi)	Draw Schering bridge and write balance condition equation.	2	3	U
vii)	What is breakaway point in root locus.	2	4	U
viii)	State gain cross over and phase crossover frequency.	2	5	U
Q.2	Solve any four questions out of six.	16		
i)	Find the transfer function of above electrical network. 	4	6	AP
ii)	Write steps to build root locus .	4	1	U

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

April – May 2023

B. Tech: Electronics and Telecommunication Engineering

Examination: SY

Course Code: **EXC304** and Course Name: **Electronic Instrumentation & Control Systems**

Date of Exam: 01/06/23

Duration: 2.5 Hours

Scheme II

Semester: III

Max. Marks: 60

iii)	Solve using mason's gain formula.	4	2	Ap
iv)	Using Routh's stability criterion determine the number of roots in right half plane, comment on stability of the system; $F(S) = S^6 + 2S^5 + 8S^4 + 12S^3 + 20S^2 + 16S + 16 = 0$	4	3	Ap
v)	Discuss how Maxwell's bridge can be used for the measurement of inductance with proper derivation and diagram.	4	4	Ap
vi)	Draw and explain a block diagram of measurement system.	4	5	U
Q.3	Solve any two questions out of three.	16		
i)	Discuss how Wheatstone bridge can be used for the measurement of resistance with proper derivation and diagram.	8	4	U
ii)	For a unity feedback system, $G(s) = K / S(S+1)(S+2)(S+4)$ find range of k, marginal value of k and frequency of sustained oscillations.	8	5	Ap
iii)	The signal flow graph for a feedback system is shown in fig. Determine the closed loop transfer function $C(S)/R(S)$.	8	1	Ap
Q.4	Solve any two questions out of three.	16		

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

April – May 2023

B. Tech: Electronics and Telecommunication Engineering

Scheme II

Examination: SY

Semester: III

Course Code: **EXC304** and Course Name: **Electronic Instrumentation & Control Systems**

Date of Exam: 01/06/23

Duration: 2.5 Hours

Max. Marks: 60

i)	A unity feedback system has an open loop transfer function $G(s)$ $H(s) = K / S (S+3) (S+5)$, construct the root locus.	8	2	Ap
ii)	A unity feedback control system has $G(s) = 100 / S(S+1) (S+2)$, Draw the bode plot, determine gain margin, phase margin, gain crossover frequency, phase crossover frequency, comment on stability.	8	3	Ap
iii)	With the help of diagram explain thermistor and its operation.	8	6	U
