

University of Mumbai

Examination 2020

Program: ETRX Engineering

Curriculum Scheme: Rev 2016

Examination: Second Year Semester IV

Course Code: ELX 406 and Course Name: LINEAR CONTROL SYSTEM

Time: 1 hour

Max. Marks: 50

For the students:- All the Questions are compulsory and carry equal marks .

Q1.	Benefits of feedback:
Option A:	Performance of system is greater.
Option B:	Need for system much larger path gain and system instability.
Option C:	Controlled variable accurately follows the desired value
Option D:	Affected by parameter variations
Q2.	Effect of feedback on sensitivity is minimum in:
Option A:	Open loop control system
Option B:	Closed loop control system
Option C:	None of the mentioned
Option D:	Both of the mentioned
Q3.	Feedback control systems are:
Option A:	Insensitive to both forward and feedback path parameter changes
Option B:	Less sensitive to feedback path parameter changes than to forward path parameter changes
Option C:	Less sensitive to forward path parameter changes than to feedback path parameter changes
Option D:	Equally sensitive to forward feedback path parameter changes
Q4.	Consider the following statements with respect to the feedback of the control systems:1. Feedback can improve stability or be harmful to stability if it is not properly applied.2. Feedback can always improve stability3. In many situations the feedback can reduce the effect of noise and disturbance on system performance.4. In general the sensitivity of the system gain of a feedback system of a parameter variation depends on where the parameter is located.
Option A:	1,2 and 3 only

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Option B:	1,3 and 4 only
Option C:	1,2 and 4 only
Option D:	1,2,3 and 4 only
Q5.	The closed system has higher _____ than open loop control system, this implies increased speed of response.
Option A:	Gain
Option B:	Bandwidth
Option C:	Frequency
Option D:	Speed
Q6.	Transient response analysis is done for _____ systems
Option A:	Unstable
Option B:	Stable
Option C:	Conditionally stable
Option D:	Marginally stable
Q7.	The input signals to control systems are not known fully ahead of time, the characteristics of control system which suddenly strain a control system are:
Option A:	Sudden shock
Option B:	Sudden change
Option C:	Constant velocity and acceleration
Option D:	All of the mentioned
Q8.	Standard test signals in control system are:
Option A:	Impulse signal
Option B:	Ramp signal
Option C:	Unit step signal
Option D:	All of the mentioned

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Q9.	The nature of transient response is revealed by _____
Option A:	Sine wave
Option B:	Cos wave
Option C:	Tan wave
Option D:	Test signals
Q10.	Step signal is the signal whose values is :
Option A:	1 for all values greater than zero
Option B:	Indeterminate at zero
Option C:	It is zero for time less than zero
Option D:	All of the mentioned
Q11.	Ramp input :
Option A:	Denotes constant velocity
Option B:	Value increases linearly with time
Option C:	It denotes constant velocity and varies linearly with time
Option D:	It varies exponentially with time
Q12.	To find system's response by means of convolution integral _____ of the system is used
Option A:	Sum
Option B:	Difference
Option C:	Exponential
Option D:	Weighing
Q13.	Routh Hurwitz criterion gives:
Option A:	Number of roots in the right half of the s-plane
Option B:	Value of the roots
Option C:	Number of roots in the left half of the s-plane
Option D:	Number of roots in the top half of the s-plane

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Q14.	A system has poles at 0.01 Hz, 1 Hz and 80Hz, zeroes at 5Hz, 100Hz and 200Hz. The approximate phase of the system response at 20 Hz is :
Option A:	-90°
Option B:	0°
Option C:	90°
Option D:	-180°
Q15.	Assertion (A): Relative stability of the system reduces due to the presence of transportation lag. Reason (R): Transportation lag can be conveniently handled by Bode plot.
Option A:	Both A and R are true but R is correct explanation of A
Option B:	Both A and R are true
Option C:	A is true but R is false
Option D:	A is false but R is true
Q16.	When the number of poles is equal to the number of zeroes, how many branches of root locus tends towards infinity?
Option A:	Equal to number of zeroes
Option B:	1
Option C:	2
Option D:	0
Q17.	If root loci plots of a particular control system do not intersect the imaginary axis at any point, then the gain margin of the system will be:
Option A:	0
Option B:	0.707
Option C:	1
Option D:	Infinite
Q18.	The addition of open loop zero pulls the root loci towards:

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Option A:	The left and therefore system becomes more stable
Option B:	The right and therefore system becomes unstable
Option C:	Imaginary axis and therefore system becomes marginally stable
Option D:	The left and therefore system becomes unstable
Q19.	If the gain of the system is reduced to a zero value, the roots of the system in the s-plane,
Option A:	Coincide with zero
Option B:	Move away from zero
Option C:	Move away from poles
Option D:	Coincide with the poles
Q20.	Which one of the following are correct?The root locus is the path of the roots of the characteristic equation traced out in the s-plane?
Option A:	As the input of the system is changed
Option B:	As the output of the system is changed
Option C:	As a system parameter is changed
Option D:	As the sensitivity is changed
Q21.	What is the number of the root locus segments which do not terminate on zeroes?
Option A:	The number of poles
Option B:	The number of zeroes
Option C:	The difference between the number of poles and zeroes
Option D:	The sum of the number of poles and the number of the zeroes
Q22.	Which one of the following is not the property of root loci?
Option A:	The root locus is symmetrical about imaginary axis
Option B:	They start from the open loop poles and terminate at the open loop zeroes
Option C:	The breakaway points are determined from $dK/ds = 0$
Option D:	Segments of the real axis are the part of the root locus if and only is the total

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	number of real poles and zeroes to their right is odd.
Q23.	Which one of the following applications software's is used to obtain an accurate root locus for?
Option A:	LISP
Option B:	MATLAB
Option C:	dBase
Option D:	Oracle
Q24.	Consider the loop transfer function $K(s+6)/(s+3)(s+5)$ In the root locus diagram the centroid will be located at:
Option A:	-4
Option B:	-1
Option C:	-2
Option D:	-3
Q25.	Which of the test signals are best utilized by the stability analysis.
Option A:	Impulse
Option B:	Step
Option C:	Ramp
Option D:	Parabolic