

University of Mumbai

Examination 2020

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev2019

Examination: SE Semester III

Course Code: ECC305 and Course Name :Electronic Instrumentation and Control

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Which among the following are 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
2.	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
3.	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
4.	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
Option B:	1,3 and 4 only
Option C:	1,2 and 4 only
Option D:	1,2,3 and 4 only
1.	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
6.	Transient response analysis is done for _____ systems
Option A:	Unstable
Option B:	Stable
Option C:	Conditionally stable
Option D:	Marginally stable
7.	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
8.	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
9.	The nature of transient response is revealed by _____
Option A:	Sine wave
Option B:	Cos wave
Option C:	Tan wave
Option D:	Test signals
10.	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
11.	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
12.	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
13.	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
14.	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°
15.	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
16.	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
17.	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
18.	The addition of open loop zero pulls the root loci towards:
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
19.	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
20.	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

Q2	Solve any Two Questions out of Three 10 marks each
A	<i>Explain the working of Linear Variable Differential Transformer</i>
B	<i>Derive the expression to find the unknown resistance using wheatstones bridge.</i>
C	<i>The open loop transfer function is given as $G(S) = K/S^2+2S+2$, sketch the root locus and comment on stability.</i>
Q3.	Solve any Two Questions out of Three 10 marks each
A	<i>Determine the stability using rouths array method $A(s)=2S^5+5S^4+4S^3+6S^2+S$</i>
B	<i>Sketch the bode plot for the given transfer function $G(S) = S+3/(S+2)$ $(S^2+2S+25)$</i>
C	<i>Write a short note on adaptive control system.</i>