University of Mumbai

Examination 2020 under cluster 4 (PCE)

Program: BE Mechanical Engineering
Curriculum Scheme: Rev2012
Examination: Third Year Semester V
Course Code: MEC502 and Course Name: Mechanical Measurements and control

Time: 1 hour   Max. Marks: 50

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

Q1.	The use of _____ instruments is merely confined within laboratories as standardizing instruments
Option A:	Absolute
Option B:	Indicating
Option C:	Recording
Option D:	Instrumenting
Q2.	A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly
Option A:	Deflecting
Option B:	Controlling
Option C:	Damping
Option D:	Recording
Q3.	The non-coincidence between loading and unloading curves is known as---
Option A:	Zero drift characteristics
Option B:	Sensitivity drift characteristics
Option C:	Hysteresis
Option D:	Zero drift plus sensitivity drift characteristics
Q4.	Backlash is commonly experienced in gear sets used to convert between translational and rotational motion. Backlash is a typical cause of
Option A:	Hysteresis
Option B:	Dead space
Option C:	Zero drift
Option D:	Sensitivity drift
Q5.	The function of potentiometer is
Option A:	To convert linear motion to rotary motion
Option B:	No conversion of energy forms
Option C:	Conversion from rotary to linear motion
Option D:	To convert rotary motion to linear rotary displacement to velocity
Q6.	In wire wound strain gauges, the change in resistance is due to
Option A:	Change in length of the wire
Option B:	Change in resistivity
Option C:	Change in diameter of the wire
Option D:	Change in both length and diameter
Q7.	The effect of tachometer feedback in a control system is to reduce

Option A:	Only time constant
Option B:	Only gain
Option C:	Damping
Option D:	Both gain and time constant
Q8.	For better results a strain gauge should have low
Option A:	Resistance temperature co-efficient
Option B:	Gauge factor
Option C:	diameter
Option D:	Resistance value
Q9.	Current flows through a circuit spontaneously when two dissimilar metals are joined to form a thermocouple, provided the two junctions formed are maintained at different temperatures. This effect is termed as _____.
Option A:	Thomson effect
Option B:	Seebeck effect
Option C:	Ranki effect
Option D:	Stefan effect
Q10.	A dead-weight pressure gauge is used for _____.
Option A:	static pressure measurement
Option B:	dynamic pressure measurement
Option C:	high-vacuum measurement
Option D:	low-volume measurement
Q11.	McLeod gauge works on _____.
Option A:	Newton's law
Option B:	Hook's law
Option C:	Boyle's law
Option D:	Pascal's law
Q12.	Rotameter is a _____
Option A:	Drag force flow meter
Option B:	Variable head flow meter
Option C:	Variable area flow meter
Option D:	Rotation propeller flow meter
Q13.	Which notation represents the feedback path in closed loop system representation?
Option A:	b(t)
Option B:	c(t)
Option C:	e(t)
Option D:	r(t)
Q14.	Transfer function of positive feedback close loop system is
Option A:	$G(s)/(1+G(s)H(s))$
Option B:	$G(s)/1-G(s)H(s)$
Option C:	$G(s)/(G(s)+H(s))$

Option D:	G(s)/G(s)H(s)
Q15.	Transfer function of mass spring damper system is_____
Option A:	$1/ (Ms^2 +Bs+K)$
Option B:	$1/ (Ms^2 -Bs+K)$
Option C:	$1/ (Ms^2 +Bs+1)$
Option D:	$1/ (s^2 +s+K)$
Q16.	The type 2 system has _____at the origin.
Option A:	No pole
Option B:	Single pole
Option C:	Two poles
Option D:	Three poles
Q17.	_____ is the time required for the response to reach 50% of the final value in the first attempt.
Option A:	Rise time
Option B:	Peak time
Option C:	Delay time
Option D:	Settling time
Q18.	Laplace transform of unit step signal is _____.
Option A:	A/s
Option B:	A
Option C:	1
Option D:	1/s
Q19.	Phase margin of a system is used to represent _____.
Option A:	Time response
Option B:	Relative stability
Option C:	Absolute stability
Option D:	Frequency response
Q20.	For a stable system_____.
Option A:	gain margin must be positive but phase margin can be positive or negative
Option B:	phase margin must be positive but gain margin can be positive or negative
Option C:	both gain margin and phase margin must be positive
Option D:	one of them must be zero
Q21.	The on-off controller is a _____ type of system.
Option A:	Digital
Option B:	Discontinuous
Option C:	Linear
Option D:	non-linear
Q22.	The integral control:
Option A:	Increases the steady state error
Option B:	Decreases the steady state error

Option C:	Increases the noise and stability
Option D:	Decreases the damping coefficient
Q23.	Which one of the following is not true in case 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 zeros
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 if the total number of real poles and zeros to their right is odd.
Q24.	For the loop transfer function K(s+6) / (s+3) (s+5). The centroid in the root locus will be located at:
Option A:	-1
Option B:	-2
Option C:	-3
Option D:	-4
Q25.	To determine the state of dynamic system _____ plays an important role
Option A:	State vector
Option B:	State space
Option C:	State scalar
Option D:	State variables

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Question	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	A
Q2.	C
Q3.	C
Q4	B
Q5	D
Q6	D
Q7	C
Q8.	A
Q9.	B
Q10.	A
Q11.	C
Q12.	C
Q13.	A
Q14.	A
Q15.	A
Q16.	C
Q17.	C
Q18.	D
Q19.	B
Q20.	C
Q21.	B
Q22.	A
Q23.	A
Q24.	B
Q25.	D