Examination 2020- Inter Cluster

Program: BE Instrumentation Engineering

Curriculum Scheme: Revised 2012

Examination: Third Year Semester V

Course Code: ISC504 and Course Name: Signal Conditioning Circuit Design

Time: 1hour

Max. Marks: 50

Q1.	In the sample and hold circuit, the period during which the voltage across capacitor
	is equal to input voltage is known as,
Option A:	Charging period
Option B:	Hold period
Option C:	Delay period
Option D:	Sample period
Q2.	A current balance bridge is used for potential measurement. The fixed resistors are $R_1=R_2=5$ K Ω , $R_3=1$ K Ω , $R_4=990$ Ω , $R_5=10$ Ω with a 10-V supply. Find the current necessary to null the bridge if the potential is 12 mV.
Option A:	1.2mA
Option B:	12mA
Option C:	1.2A
Option D:	2A
Q3.	The locking range of PLL is always:
Option A:	Same as its capture range
Option B:	Greater than capture range
Option C:	Smaller than capture range
Option D:	Half of the tracking range
Q4.	In analog signal conditioning, the loading of one circuit by another causes -
Option A:	unwanted signals to the output
Option B:	Oscillations at the output
Option C:	Uncertainty in the amplitude of a voltage as it is passed through the measurement process.
Option D:	Oscillations at the input
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Q5.	A signal conditioning circuit for a strain gauge type of pressure sensor transducer would use a instrumentation amplifier with the programmable gain for
Option A:	Signal amplification
Option B:	Signal linearization
Option C:	Noise filtering
Option D:	Sensor excitation

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Q6.	In photovoltaic detector the value of resistance and short circuit current are 1 K Ω
	and current is 5 μ A. The output voltage is-
Option A:	5 v
Option B:	5 mA
Option C:	0.5 V
Option D:	0.05 V
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07.	Benefit of using voltage follower circuit with thermistor temperature sensor is
Option A:	It provides infinite gain
Option B:	It provides impedance matching
Option C:	It amplifies voltage
Option D:	It balances ground effect on either side of input and output
08.	The divider of has $R_1=10k \Omega$ and $V_s=10V$. Suppose is a sensor whose resistance
X o.	varies from 4.00 kQ to 12.0 kQ has some dynamic variable varies over a range.
	Find the minimum of $V_{\rm D}$
Option A.	1 43V
Option B:	13 AV
Option C:	10.7V
Option D:	1.043 V 14 2V
Option D.	14.5 V
00	In piezoalectric transducer, electrical output is proportional to
Q9.	In plezoelectric transducer, electrical output is proportional to-
Option A:	Applied resistance
Option B:	Applied temperature
Option C:	Applied voltage
Option D:	Applied force
0.1.0	
Q10.	A 555 timer in monostable application mode can be used for
Option A:	Pulse position modulation
Option B:	Frequency shift keying
Option C:	Speed control and measurement
Option D:	Digital phase detector
Q11.	An unbalanced Wheatstone Bridge has R1, R4 and R2, R3 in opposite arms (legs).
	DC supply connected at intersection of R1, R3 and R2, R4. Output voltage
	measured at intersection of R1, R2 and R3, R4. Determine output voltage, if R1=
	80 Ω , R2=120 Ω , R3=480 Ω , R4=160 Ω and DC supply of 100 V.
Option A:	35 V
Option B:	100 V
Option C:	70 V
Option D:	0 V
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Q12.	The change in resistance of a metal wire owing to strain is due to
	S1: Change in dimension of wire expressed by factor $(1-2\mu)$
	S2: Change in resistance?
Option A:	S1 is false & S2 is true
Option B:	S2 is true & S1 is false
Option C:	Both S1 & S2 are true
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Option D:	Both S1 & S2 are false
Q13.	A current to voltage converter produces,
Option A:	proportional output voltage for a variable input current
Option B:	proportional output current for a variable input voltage
Option C:	variable output voltage for a constant input current
Option D:	constant output voltage for a variable input current
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Q14.	Select the temperature sensor that you would select for high temperature
-	measurement circuit (above 1000°C).
Option A:	RTD
Option B:	Thermistor
Option C:	Thermocouple
Option D:	Filled system thermometer
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015.	Most light sensitive transducer for conversion of light into electrical power is the
Option A:	Photodiode
Option B:	Solar cell
Option C:	Photoconductive cell
Option D:	Photovoltaic cell
Q16.	The smallest resistor in a 12 bit weighted resistor DAC is $2.5k\Omega$, what will be the
	largest resistor value?
Option A:	40.96ΜΩ
Option B:	10.24ΜΩ
Option C:	61.44 MΩ
Option D:	18.43ΜΩ
Q17.	Which factor makes the differentiator circuit unstable?
Option A:	Output impedance
Option B:	Input voltage
Option C:	Gain
Option D:	Noise
Q18.	Which of the following are adjustable voltage regulator?
Option A:	78XX series
Option B:	79XX series
Option C:	IC 555
Option D:	LM317
Q19.	A certain inverting amplifier has a closed-loop voltage gain of 25. The Op-amp has
	an open-loop voltage gain of 100,000. If an OP-amp with an open-loop voltage
	gain of 200,000 is substituted in the arrangement. the closed-loop gain:
Option A:	Doubles
Option B:	Remains at 25
Option C:	Drops to 12.5

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Option D:	Increases slightly
Q20.	Drawback of counter type A/D converter
Option A:	Counter clears automatically
Option B:	More complex
Option C:	High conversion time
Option D:	Low speed
Q21.	Given that the breakdown voltage is 5V, $R1=10k\Omega$, $R2=100k\Omega$, $R3=200k\Omega$,
	R4=10 Ω . The source voltage V _S =25V.
Option A:	10%
Option B:	20.22%
Option C:	14.28%
Option D:	15.66%
Q22.	Which bridge is utilized in signal conditioning circuits for balancing purpose?
Option A:	Maxwell Bridge
Option B:	Wheatstone Bridge
Option C:	Wein Bridge
Option D:	Kelvin Bridge
Q23.	Find output voltage equation for 3 bit DAC converter with R and 2R resistor?
Option A:	$V_0 = -R_F [(b_2/8R) + (b_1/4R) + (b_0/2R)]$
Option B:	$V_0 = -R_F [(b_2/R) + (b_1/2R) + (b_0/4R)]$
Option C:	$V_0 = -R_F [(b_2/2R) + (b_1/4R) + (b_0/8R)]$
Option D:	$V_0 = -R_F [(b_0/4R) + (b_1/2R) + (b_2/R)]$
Q24.	What is the range of the voltage level of the LM317 adjusted voltage regulator
Option A:	0 V to 5 V
Option B:	1.2 V to 37 V
Option C:	-5 V to -24 V
Option D:	5 V to 24 V
Q25.	Calculate the cut-off frequencies of a bandpass filter with $R1 = R2 = 5 \text{ k}\Omega$ and $C1$
	$= C2 = 0.1 \ \mu F$
Option A:	$F_{OL} = 636.6 \text{ Hz}, F_{OH} = 636.6 \text{ Hz}$
Option B:	$F_{OL} = 636.6 \text{ Hz}, F_{OH} = 318.3 \text{ Hz}$
Option C:	$F_{OL} = 318.3 \text{ Hz}, F_{OH} = 636.6 \text{ Hz}$
Option D:	$F_{OL} = 318.3 \text{ Hz}, F_{OH} = 318.3 \text{ Hz}$