Subject Name: Instrumentation Engineering

Display Number Panel: Yes
Group All Questions: No

Question Number : 1 Question Id : 7621612161 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $x \neq 0$, $A = \begin{bmatrix} 1 & x & 2x \\ 1 & 3x & 5x \\ 1 & 3 & 4 \end{bmatrix}$ and det A $= 0$, then the value of x is

Options :

1. 1

2. -1

3. 2

4. 3

Question Number : 2 Question Id : 7621612162 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The value of I $= \int_0^1 x(1-x)^n dx$ is

Options :

1. $\dfrac{1}{(n+1)(n+2)}$

2. $\dfrac{1}{n^2+2}$

3. $(n+1)(n+2)$

4. $n^2 + 2n + 2$

Question Number : 3 Question Id : 7621612163 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The stationary points of $f(x) = x^3 - 6x^2 + 9x + 15$ are

Options :

1. $x = 1, 2$

2. $x = 1, 3$

3. x = 2 , 3

4. x = − 1 , 3

The value of the integral $\int\limits_{0}^{3}\int\limits_{0}^{1}\left(x^2+3y^2\right)dydx$ is

Options :

1. 4

2. 6

3. 8

4. 12

The general solution of the differential equation: x dy− y dx = a (x² + y²) is

Options :

1. $tan^{-1}\dfrac{Y}{X}=a\,y+c$

2. $tan^{-1}\dfrac{Y}{X}=a\,x+c$

3. $tan^{-1}\dfrac{X}{Y}=a\,y+c$

4. $tan^{-1}\dfrac{X}{Y}=a\,x+c$

The solution of the differential equation $y = p(x − b) + \dfrac{a}{p}$,where $p = \dfrac{dy}{dx}$ and c is any real number, is

Options :

1. $y = cx − \dfrac{a}{c} + bc$

2. $y = x + \dfrac{a}{c} + bc$

3. $y = cx + \dfrac{a}{c} − bc$

4. $y = x + ac + bc$

If $\phi(x, y, z) = xyz$ then the directional derivative of ϕ at $(1,1,1)$ in the direction of $i + j + k$ is

Options :

1. 3

2. $\dfrac{1}{3}$

3. $\dfrac{1}{\sqrt{3}}$

4. $\sqrt{3}$

Question Number : 8 Question Id : 7621612168 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The residue of the function $f(z) = \dfrac{z}{z^2 + 1}$ at the pole $z = i$

Options :

1. $-\dfrac{1}{2}$

2. $\dfrac{1}{2}$

3. -2

4. 2

Question Number : 9 Question Id : 7621612169 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If C is $|z| = 2$, the value of $\int \dfrac{e^{2z}}{(z+1)^3} dz$ over C that can be obtained by applying Residue theorem is

Options :

1. $\dfrac{4\pi i}{e}$

2. $4\pi e$

3. $\dfrac{4\pi i}{e^2}$

4. $\dfrac{4\pi i}{e^3}$

Question Number : 10 Question Id : 7621612170 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In a binomial distribution if the mean and variance are 4 and 4/3 respectively, then the number of trials is

Options :

1. 4

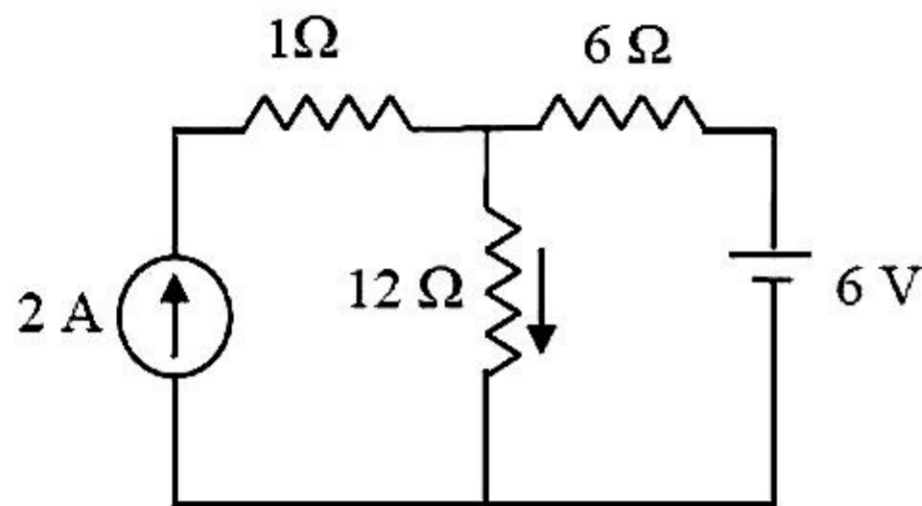2. 6

3. 10

4. 12

Question Number : 11 Question Id : 7621612171 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Calculate the value of voltage drop across 12 Ω resistor.

Options :

1. 6 V

2. 24 V

3. 15 V

4. 12 V

Question Number : 12 Question Id : 7621612172 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Two impedances of a circuit $Z_1 = 4 + j3$ and $Z_2 = 3 + j4$ are connected in series. The power factor of the circuit is

Options :

1. $1/\sqrt{2}$

2. $1/\sqrt{3}$

3. 1

4. 1/2

Question Number : 13 Question Id : 7621612173 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Find the Thevenin equivalent resistance from terminals A and B for the following circuit.

Options :

1. 6 Ω

2. 24 Ω

3. 36 Ω

4. 12 Ω
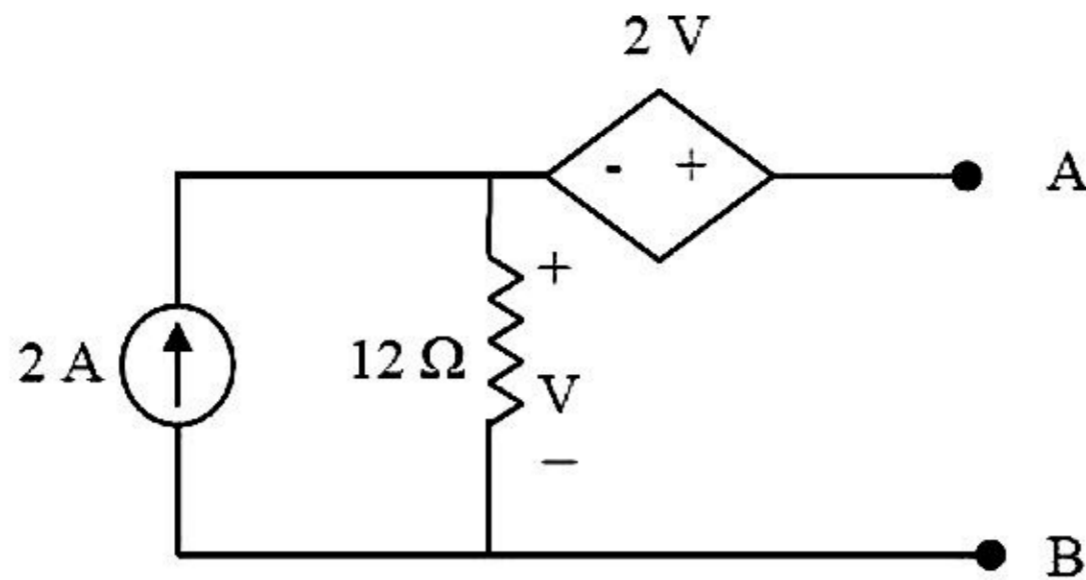
Question Number : 14 Question Id : 7621612174 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In a two port network, if input port V_1 and I_1 are expressed in terms of output port V_2 and $-I_2$, then the network matrix is called

Options :

1. Admittance matrix

2. Transmission matrix

3. Impedance matrix

4. Hybrid matrix

Question Number : 15 Question Id : 7621612175 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In an RLC series circuit with a dc supply voltage of V, if a closed switch is opened at time $t = 0$, then the current is

Options :

1. 0

2. V/R

3. V/√RC

4. V√L/R

Question Number : 16 Question Id : 7621612176 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Two resistors (50 ± 3) Ω and (75 ± 4) Ω are connected in series, where 3 Ω and 4 Ω are standard deviations. The resultant resistance is

Options :

1. $(125 \pm 5)\,\Omega$

2. $(125 \pm 3.5)\,\Omega$

3. $(125 \pm 2\sqrt{3})\,\Omega$

4. $(125 \pm 7)\,\Omega$

Question Number : 17 Question Id : 7621612177 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In measurement instrument, which of the following are totally undesirable static characteristics?

Options :

1. Drift, reproducibility and dead zone

2. Sensitivity, static error and dead zone

3. Drift, static error, dead zone & non-linearity

4. Reproducibility, sensitivity and non-linearity

Question Number : 18 Question Id : 7621612178 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Errors due to loading effects of instruments are under the category of

Options :

1. Gross errors

2. Random errors

3. Parallax errors

4. Systematic errors

Question Number : 19 Question Id : 7621612179 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

There are two meters A and B. Meter A has lower range than meter B. Choose correct statement from the following.

Options :

1. Meter A has more precision

2. Meter B has more precision

3. Meter A has low accuracy

4. Meter B has low accuracy

Question Number : 20 Question Id : 7621612180 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Identify the incorrect current equation for the following figure.
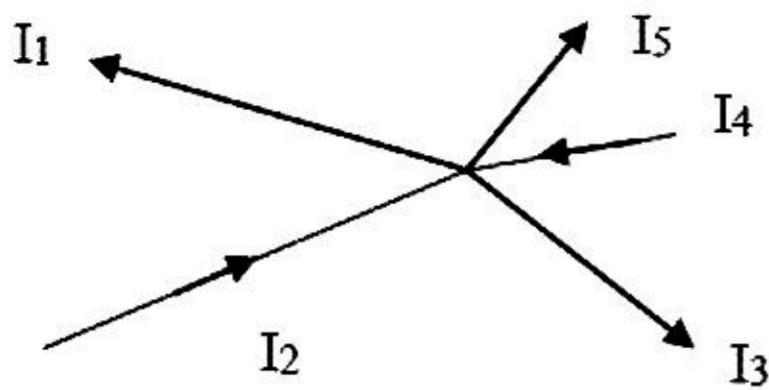
Options :

1. $I_4 - I_5 = I_1 - I_2 + I_3$

2. $I_2 - I_4 = I_1 - I_3 + I_5$

3. $I_2 - I_3 - I_5 = I_1 - I_4$

4. $I_1 - I_2 - I_4 = I_3 + I_5$

Question Number : 21 Question Id : 7621612181 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A transducer has an output impedance of 1 kΩ and the load resistance is 1 Ω. The transducer behaves as

Options :

1. a constant current source

2. a constant voltage source

3. a constant power source

4. constant voltage & current source

Question Number : 22 Question Id : 7621612182 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The resistance of a Thermistor _____ as the temperature _____

Options :

1. remain same ....……increases

2. increases ....…decreases

3. decreases ....…increases

4. remain same ....…decreases

Question Number : 23 Question Id : 7621612183 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A rotameter is used for measurement of _____ and has _____ scale

Options :

1. flow rate .... non-linear

2. flow rate ....…linear

3. rotation angle...................…non-linear

4. rotation angle ……………….. linear

The natural frequency of a diaphragm element is proportional to

Options :

1. square of thickness

2. square of diameter

3. 1/ square of thickness

4. 1/ square of diameter

If 't' and 'D' are thickness of wall and mean diameter of a bellows element, then the displacement 'd' is

Options :

1. $d \propto \dfrac{D^2}{t^3}$

2. $d \propto \dfrac{D^3}{t^2}$

3. $d \propto \dfrac{D^2}{t^2}$

4. $d \propto \dfrac{D}{t^3}$

In wire wound strain gauges, the change in resistance of the wire due to strain is mainly because of

Options :

1. change in both length and resistivity

2. change in both diameter and resistivity

3. change in length, diameter and resistivity

4. change in both length and diameter

The size of iron cored transducer as compared to air cored transducer is

Options :

1. exactly same

2. nearly same

3. bigger

4. smaller

Question Number : 28 Question Id : 7621612188 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Thermo-couple transducers and Piezo-electric transducers are _____ respectively.

Options :

1. active and inverse transducers

2. passive and inverse transducers

3. active and passive transducers

4. inverse and active transducers

Question Number : 29 Question Id : 7621612189 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The resistance value of a thermistor is 5000 Ω at 25^0C and its resistance temperature coefficient is 0.04 /^{0}C. A measurement with a lead resistance of 10 Ω will cause an error of

Options :

1. 0.01^0C

2. 0.05^0C

3. 0.5^0C

4. 0.1^0C

Question Number : 30 Question Id : 7621612190 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Choose a correct statement from the following. An LVDT has

Options :

1. one primary & two secondary windings and supply frequency between 0 & 50 Hz

2. two primary & one secondary windings and supply frequency between 0 & 50 Hz

3. one primary & two secondary windings and supply frequency between 50 Hz & 20 kHz

4. two primary & one secondary windings and supply frequency between 50 Hz & 20 kHz

Question Number : 31 Question Id : 7621612191 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

When the humidity changes from 100% to 0%, the resistance of resistive hygrometer changes from

Options :

1. 10^9 to $10^4 \Omega$

2. 10^4 to 10Ω

3. 10 to 10^4 Ω

4. 10^4 to 10^9 Ω

When seismic transducers are used in the acceleration mode, they should be designed with

Options :

1. weak springs and small mass

2. weak springs and heavy mass

3. stiff springs and heavy mass

4. stiff springs and small mass

The current gain in the common emitter configuration is 50. Then the current gain in the common base configuration is

Options :

1. 98

2. 0.98

3. 100

4. 9.8

The voltage gain of common collector amplifier is

Options :

1. Unity and the signal undergoes phase inversion

2. Unity and the signal undergoes no phase inversion

3. More than unity and the signal undergoes no phase inversion

4. More than unity and the signal undergoes phase inversion

In an amplifier with feedback, A_{OL} =100 and β = 0.04. If 20 mV is the input signal needed to derive an output V_0 without feedback, then the input signal required to obtain the same output with feedback is

Options :

1. 200 mV

2. 50 mV

3. 2000 mV

4. 100 mV

L - C oscillators are not used in the audio frequency range mainly because

Options :

1. Positive feedback cannot be employed

2. Size of the inductor is small

3. Negative feedback cannot be employed

4. Size of the inductor is very large

In a perfect symmetrical differential amplifier

Options :

1. Common mode gain is zero and CMMR is infinite

2. Common mode gain is infinite and CMMR is zero

3. Common mode gain is unity and CMMR is infinite

4. Common mode gain is unity and CMMR is zero

The transfer characteristic of MOSFET is a plot of

Options :

1. Drain current vs. V_{GS}

2. Drain current vs. V_{DS}

3. Gate current vs. V_{GS}

4. Source current vs. V_{DS}

An operational amplifier has unity gain frequency of 200 MHz with a 3 dB frequency band width of 20 kHz. Then the gain is

Options :

1. 1000 dB

2. 80 dB

3. 800 dB

4. 100 dB

The output voltage of a dc voltage circuit is 48 V at full-load. If the voltage regulation is 4%, find the output voltage at no-load.

Options :

1. 46 V

2. 52 V

3. 50 V

4. 44 V

The coupling which gives highest gain in amplifiers is

Options :

1. Resistive coupling

2. Transformer coupling

3. Capacitance coupling

4. Impedance coupling

In a negative feedback amplifier, the output impedance will be decreased, if the

Options :

1. sampled signal is current

2. sampled signal is voltage

3. feedback signal is voltage

4. feedback signal is current

An n-channel MOSFET is better than p-channel type MOSFET, because of

Options :

1. good TTL compatibility

2. better drive capability

3. faster operation

4. better noise immunity

The conduction takes place less than half of the cycle in _____ power amplifiers.

1. Class AB

2. Class B

3. Class C

4. Class A

Question Number : 45 Question Id : 7621612205 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A RC differentiator circuit converts a triangular wave into

Options :

1. Ramp wave

2. Square wave

3. Spike wave

4. Saw-tooth wave

Question Number : 46 Question Id : 7621612206 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which configuration is used in constant current sweep generator circuit using BJT?

Options :

1. Darlington pair

2. Common base

3. Common emitter

4. Common collector

Question Number : 47 Question Id : 7621612207 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The transfer characteristic of half wave precision rectifier is

Options :

1. linear in first quadrant passing through origin

2. linear in first quadrant with intercept on x-axis

3. non-linear in first quadrant with intercept on x-axis

4. parallel to x-axis

Question Number : 48 Question Id : 7621612208 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The time period 'T' of a astable multi-vibrator when running as a voltage – to – frequency converter is

Options :

1. $2RC\ Ln\left(1+\dfrac{V}{V_{CC}}\right)$

2. $2RC\ Ln\left(1-\dfrac{V}{V_{CC}}\right)$

3. $2RC \, Ln\left(1 - \dfrac{V_{CC}}{V}\right)$

4. $2RC \, Ln\left(1 + \dfrac{V_{CC}}{V}\right)$

Question Number : 49 Question Id : 7621612209 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following is a non-maskable and vectored interrupt?

Options :

1. INTR

2. RST 5.5

3. RST 6.5

4. TRAP

Question Number : 50 Question Id : 7621612210 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Choose a correct statement from the following

Options :

1. Both NOR gate and NOT gate are universal gates

2. NOR gate is universal gate

3. NAND gate is not universal gate

4. Both NAND and AND gates are universal gates

Question Number : 51 Question Id : 7621612211 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In a NOR circuit SR flip flop, the ' Not Allowed ' condition is

Options :

1. $S = 1, R = 0$

2. $S = 0, R = 1$

3. $S = 1, R = 1$

4. $S = 0, R = 0$

Question Number : 52 Question Id : 7621612212 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The unique number of states of a ring counter using 3 D flip-flops are

Options :

1. 3

2. 9

3. 8

4. 4

Question Number : 53 Question Id : 7621612213 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An input device is interfaced with Intel 8085 microprocessor as memory mapped I/O. If the address of the device is 3000 H and the data is to be transferred from the device to Accumulator of the processor, then the sequence of instructions would be

Options :

1. LXI   H, 3000H
   MOV M, A

2. LHLD 3000H
   MOV A, M

3. LHLD 3000H
   MOV M, A

4. LXI   H, 3000H
   MOV A, M

Question Number : 54 Question Id : 7621612214 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An 8085 microprocessor has _____ general purpose registers.

Options :

1. six 16 bit

2. six 8 bit

3. three 8 bit

4. two 16 bit

Question Number : 55 Question Id : 7621612215 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The binary equivalent of decimal number 435 is

Options :

1. 1110110011

2. 1101100011

3. 1100110011

4. 1100111011

Question Number : 56 Question Id : 7621612216 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In Boolean algebra $X(X + XY) = X$ is called _____ postulate.

Options :

1. Commutative

2. Distributive

3. Associative

4. Absorption

The output of the Boolean function $Y = \overline{A + A\bar{B} + A\bar{B}C}$ is

Options :

1. A

2. $\bar{A}$

3. B

4. $\bar{C}$

Out of S, R, J, K, Present, Clear inputs to flip flops, the synchronous inputs are

Options :

1. S, R, Present and Clear only

2. S, R, J and K only

3. S and R only

4. Present and Clear only

Which of the following logic families has the highest fan out?

Options :

1. CMOS

2. TTL

3. MOS

4. ECL

A mono stable multi-vibrator can be constructed with

Options :

1. two NOR gates

2. one NAND and one NOT gate

3. two NOT gates

4. three NAND gates

The decimal equivalent of hexadecimal number BC6F is

Options :

1. 49007

2. 48237

3. 49004

4. 48239

Question Number : 62 Question Id : 7621612222 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The discrete time system given by y(n) = x(n^2) is

Options :

1. non casual, time invariant and linear

2. casual, time variant and non linear

3. casual, time invariant and non linear

4. non Casual, time variant and non linear

Question Number : 63 Question Id : 7621612223 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The Fourier transform of $\dfrac{d^n f(t)}{dt^n}$ is

Options :

1. $(j\omega^n)F(\omega)$

2. $(j\omega)^n F(\omega)$

3. $(j\omega)F(\omega)$

4. $(j\omega)F(\omega)^n$

Question Number : 64 Question Id : 7621612224 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For a unit step function $\left.\begin{array}{l} x[n] = 1, n \geq 0 \\ x[n] = 0, \ otherwise \end{array}\right\}$, the z transform is given by

Options :

1. $X(z) = \dfrac{1}{1-z^{-1}}, |z| > 1$

2. $X(z) = \dfrac{1}{1-z^{-1}}, |z| > 0$

3. $X(z) = \dfrac{1}{1+z^{-1}}, |z| > 0$

4. $X(z) = \dfrac{1}{1+z^{-1}}, |z| > 1$

Question Number : 65 Question Id : 7621612225 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For a FM wave, carrier modulating frequency is 10 kHz and bandwidth is 2 MHz . If the modulating signal amplitude is doubled, the bandwidth will be

Options :

1. 2 MHz

2. 2 kHz

3. 4 MHz

4. 4 kHz

Final value theorem is used to find

Options :

1. final and initial value of system output

2. initial value of system input

3. initial value of system output

4. steady state value of system output

A synchronous Amplitude Shift Keying Demodulator consists of

Options :

1. Square law detector, Half wave rectifier and Voltage limiter

2. Half wave rectifier, Low pass filter, Voltage limiter and Comparator

3. Square law detector, Low pass filter,   Comparator and Voltage limiter

4. Half wave rectifier, Square law detector, Low pass filter and Comparator

In Quadrature phase shift keying, the sine wave carrier takes four phase reversals such as

Options :

1. 0°, 90°, 180°, and 270°

2. 0°, 45°, 90°, and 180°

3. 0°, 120°, 240°, and 360°

4. 60°, 150°, 240°, and 330°

A carrier wave is simultaneously modulated by two sine waves with modulation indices M_1 and M_2. The resultant modulation index is

Options :

1. $M_1 - M_2$

2. $\sqrt{\dfrac{M_1^2 + M_2^2}{2}}$

3. $\sqrt{M_1 M_2}$

4. $M_1 + M_2$

The signal $x(t) = \begin{cases} t^{-1/2}, & t \geq 1 \\ 0, & t < 1 \end{cases}$ has

Options :

1. infinite energy & infinite average power

2. infinite energy & zero average power

3. zero energy & infinite average power

4. zero energy & zero average power

Consider two signals $x_1[n] = e^{j2n}$ and $x_2[n] = e^{\frac{j\pi n}{8}}$. Choose correct statement from the following.

Options :

1. Both the signals are aperiodic

2. Both the signals are periodic

3. First signal is aperiodic and second signal is periodic

4. First signal is periodic and second signal is aperiodic

The Laplace transform of a function $f(t)$ is $(s) = 1/(s-6)^2$. Then

Options :

1. $f(t) = -te^{6t}$

2. $f(t) = te^{-6t}$

3. $f(t) = -te^{-6t}$

4. $f(t) = te^{6t}$

To realize a 8 to 1 multiplexer, the minimum number of 2 to1 multiplexers required is

Options :

1. 9

2. 8

3. 6

4. 7

The basic step size of a 9-bit digital to analog converter is 10 mV. If 000000000 represents 0 V, the output produced for the input 101101110 is

Options :

1. 4.70 mV

2. 4.64 mV

3. 4.54 mV

4. 4.06 mV

The vector address of the interrupt RST 5.5 is

Options :

1. 003CH

2. 002CH

3. 0034H

4. 0024H

The final value theorem cannot be applied to which of the following Laplace function?

Options :

1. $F(s) = \dfrac{10}{s(s+2)}$

2. $F(s) = \dfrac{2s+5}{7s^2+6s}$

3. $F(s) = \dfrac{11}{(s+1)(s^2+4)}$

4. $F(s) = \dfrac{11}{(s+1)(s^2+4s)}$

The modulus of 4-bit Johnson counter is

Options :

1. 16

2. 17

3. 5

4. 4

The circuit normally used in digital instruments to convert sine wave into rectangular pulses is

Options :

1. Schmitt trigger

2. Sample and Hold circuit

3. Differential amplifier

4. Saw-tooth generator

Which type of meter cannot be used for ac and dc measurements?

Options :

1. Rectifier type meter

2. Electro dynamo meter

3. Electro-static type

4. Induction type meter

The torque - weight ratio of an instrument indicates

Options :

1. selectivity

2. accuracy

3. sensitivity

4. fidelity

A 5 MHz cathode ray oscilloscope (CRO) has

Options :

1. 5 MHz horizontal oscillator

2. 5 MHz vertical oscillator

3. 5 MHz sweep

4. 5 MHz supply frequency

Question Number : 82 Question Id : 7621612242 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A 0 to 150 V voltmeter has a guaranteed accuracy of 1 % full scale reading. The voltage measured by the instrument is 80 V. The percentage limiting error is,

Options :

1. 0.875

2. 1.875

3. 1.000

4. 1.800

Question Number : 83 Question Id : 7621612243 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Two millimeters, with a full scale current of 5 mA and 20 mA are connected in parallel and they read 1 mA and 2 mA respectively. Then the ratio of their internal resistances is

Options :

1. 4:1

2. 1:2

3. 1:4

4. 2:1

Question Number : 84 Question Id : 7621612244 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In low power factor wattmeter, a compensating coil is connected in

Options :

1. shunt with voltage coil

2. shunt with current coil

3. series with voltage coil

4. series with current coil

Question Number : 85 Question Id : 7621612245 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In an electronic ohmmeter, an Op-amp is used as a:

Options :

1. Comparator

2. Multiplier

3. Integrator

4. Differentiator

In a CRO, a Lissajous figure appear to move slowly and continuously, then the ratio of two frequencies

Options :

1. is not exactly a simple ratio of each other

2. is exactly a integer ratio of each other

3. changes continuously

4. is infinity

Comparator is used in

Options :

1. Successive approximation type DVM

2. Ramp type DVM only

3. Potentiometric type and Successive approximation type DVMs

4. Integrating and Ramp type DVMs

Pick an incorrect option from the following: DC potentiometers can be used for

Options :

1. calibration of voltmeter & measurement of resistance

2. calibration of ammeter & measurement of power

3. calibration of wattmeter & measurement of current

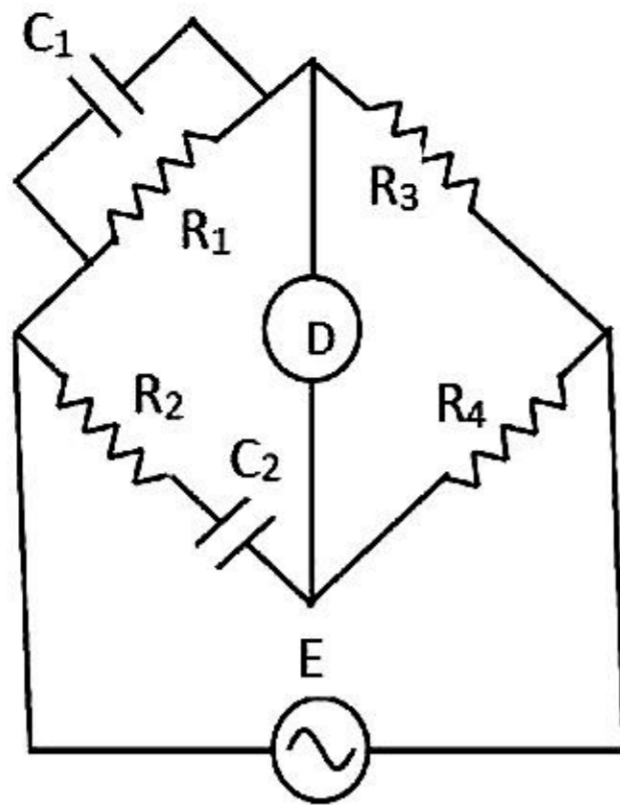4. calibration of ohmmeter & measurement of energy

The bridge in which inductance is dependent on supply frequency is

Options :

1. Maxwell inductance bridge

2. Hay's bridge

3. Maxwell inductance and capacitance bridge

4. Anderson's bridge

In the following Wein's bridge R_1 and R_2 can be varied and are mechanically coupled. The frequency is given by: $f = 1/2\pi RC$, when

Options :

1. $R_1 = R_2$, $R_3 = R_4$ and $2C_1 = C_2$

2. $R_1 = R_2$, $R_3 = 2R_4$ and $C_1 = C_2$

3. $R_1 = R_2$, $2R_3 = R_4$ and $C_1 = C_2$

4. $R_1 = R_2$, $R_3 = R_4$ and $C_1 = 2C_2$

Question Number : 91 Question Id : 7621612251 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In Wagner earth device, two variable impedances used are:

Options :

1. $R_1 - jX_C$ and $R_2 - jX_C$

2. $R_1 + jX_L$ and $R_2 - jX_C$

3. $R_1 - jX_C$ and $R_2 + jX_L$

4. $R_1 + jX_L$ and $R_2 + jX_L$

Question Number : 92 Question Id : 7621612252 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If the characteristic equation of a system is $s^2 + 2 = 0$, the system is,

Options :

1. over damped

2. critically damped

3. under damped

4. undamped

Question Number : 93 Question Id : 7621612253 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The closed loop transfer function of a system is $\frac{C(s)}{R(s)} = \frac{(s-2)}{(s+1)(s+2)(s+4)}$. Then the system

Options :

1. is conditionally stable

2. is unstable

3. stability cannot be found

4. is stable

The open loop transfer function of a control system has 5 poles and 3 zeros, the number of root locus paths will be,

Options :

1. 5

2. 3

3. 8

4. 2

The gain margin for a marginally stable system is

Options :

1. infinity

2. 0

3. positive

4. negative

The points in the s-plane where the function does not exist are known as,

Options :

1. analysis points

2. initial points

3. singular points

4. non-existence points

The transfer function of a control system is given by $\frac{1}{2s^2+2s+1}$. The damping ratio is

Options :

1. $2/\sqrt{2}$

2. $\sqrt{2}/2$

3. $1/\sqrt{2}$

4. $\sqrt{2}$

The order and type of the system $H(s) = \dfrac{s+4}{s^2(s+3)(s^2+s+5)}$ is

Options :

1. 5 and 2 respectively

2. 2 and 5 respectively

3. 5 and 4 respectively

4. 4 and 5 respectively

For satisfactory control of vapour pressure process _____ control is used

Options :

1. Proportional

2. Proportional Integral

3. Proportional Derivative

4. Proportional Integral Derivative

The root locus branches start from _____ and terminate at _____

Options :

1. open loop poles ……….. zeros

2. zero ………… another zero

3. open loop zeros ……….. poles

4. pole ………… another pole

The steady-state error for step input of the following feedback system is

Options :

1. $1/(1- G_1G_2)$

2. $1/(1+\tau G_1G_2)$

3. $1/(1+ G_1G_2)$

4. $1/(1 - \tau G_1G_2)$

Question Number : 102 Question Id : 7621612262 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
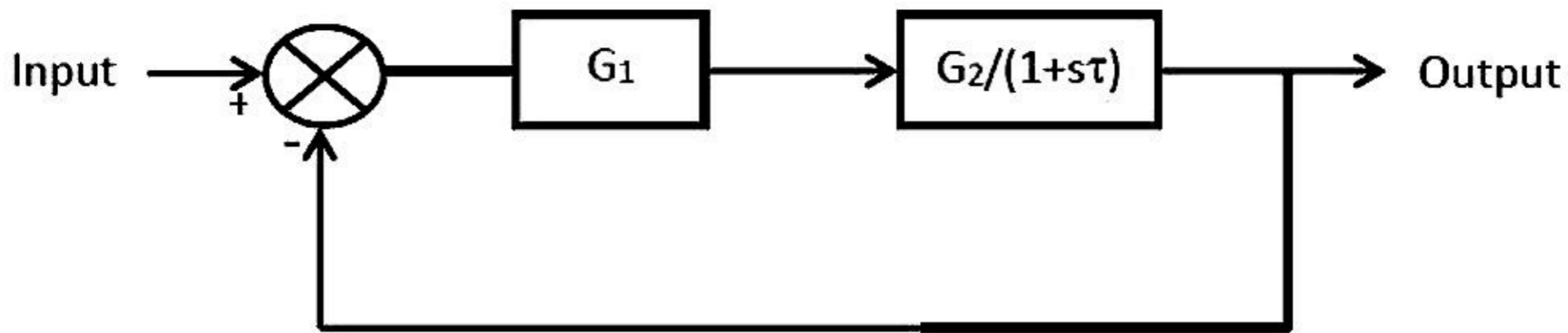
A unity negative feedback control system $G(j\omega)$ has its phase angle of -165° at a frequency where its magnitude is zero dB. The phase margin is

Options :

1. -30°

2. +15°

3. +30°

4. -15°

Question Number : 103 Question Id : 7621612263 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The open loop transfer function of a unity feedback control system is $\dfrac{1}{s(s+5)}$. The steady state error of the system due to a step input is

Options :

1. infinity

2. 1

3. 0.2

4. 0

Question Number : 104 Question Id : 7621612264 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In first order control system, for a step input the rise time defined as time
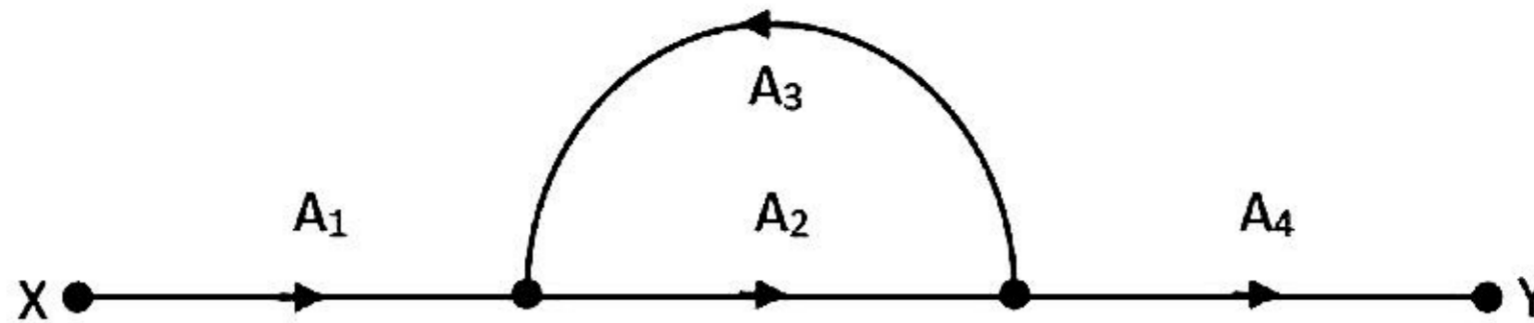
Options :

1. between 10% and 90% of final value

2. between 1% and 99% of final value

3. at which the response is 63.2% of final value

4. at which the response is 36.8% of final value

For the following signal flow graph, Y/X is equal to

Options :

1. $A_1A_2A_4/(1 + A_2A_3)$

2. $(1 - A_2A_3)/A_1A_2A_4$

3. $A_1A_2A_4/(1 - A_2A_3)$

4. $(1 + A_2A_3)/A_1A_2A_4$

If the impulse response of a system is $c(t) = e^{-t}(t + 3)$, then its transfer function is

Options :

1. $3s/(s + 1)^2$

2. $(3s + 4)/(s + 1)^2$

3. $(s + 1)^2/(3s + 4)$

4. $3/(s + 1)$

The frequency of an EEG waveform is 15 Hz. Then the wave is called

Options :

1. alpha wave

2. theta wave

3. beta wave

4. delta wave

In clinical measurements, for the measurement of sodium and potassium _____ is used.

Options :

1. Calorimeter

2. Spectro photometer

3. Flame photometer

4. Filler photometer

The photodiode that is not widely used is

Options :

1. Avalanche photodiode

2. PN photodiode

3. PIN photodiode

4. Schottky photodiode

An opto-coupler is used to transmit _____ information from one voltage potential to another while maintaining isolation of the potentials of less than _____

Options :

1. analog or digital ………… 2 kV

2. only analog ……………... 2 kV

3. only digital ……………… 2 kV

4. analog or digital ………… 5 kV

Which of the following types of opto-coupler devices are used only in dc circuits and not in ac circuits?

Options :

1. photo transistor & photo darlington

2. photo transistor & photo SCR

3. photo SCR & photo darlington

4. photo Triac & photo Darlington

In an extrinsic photo-resistor, the impurity added is

Options :

1. cadmium sulfide

2. sulphur

3. cadmium

4. phosphorous

In mass spectrometry, MALDI stands for

Options :

1. Matrix Assisted Laser Desorption Ionization

2. Mass Assisted Laser Desorption Ionization

3. Matrix Assisted Laser Destruction Ionization

4. Mass Assisted Laser Destruction Ionization

In Diode array spectrometer , if (Sx / Nx) is signal to noise ratio at any point 'x' after single scan , then the signal to noise ratio (S / N) of after 'n' scans is given by,

Options :

1. nS_x/N_x

2. $S_x/\sqrt{n}N_x$

3. $\sqrt{n}S_x/N_x$

4. S_x/nN_x

In UV and visible spectro-photo meter, if T is transmittance (P/P$_0$) of power, the meter reads the absorbance A as

Options :

1. $A = log_{10}(P/P_0)$

2. $A = ln(P/P_0)$

3. $A = ln(P_0/P)$

4. $A = log_{10}(P_0/P)$

Pick a correct option from the following four statements

(a) For a given forward bias voltage, LED conducts more current than a normal diode

(b) For a given forward bias voltage, LED conducts lesser current than a normal diode

(c) LED material is Gallium arsenide

(d) LED material is Si and Ge

Options :

1. (a) and (d) are true

2. (b) and (d) are false

3. (b) and (c) are false

4. (a) and (c) are false

Question Number : 117 Question Id : 7621612277 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Choose a correct statement from the following

Options :

1. Skin surface electrodes are used in ECG and EEG

2. Glass electrodes are used in ECG and EMG

3. Micro electrodes are used in EEG, EEG and EMG

4. Needle electrodes are used in ECG, EMG and EEG

Question Number : 118 Question Id : 7621612278 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Interferometers are used in industry for

(a) small displacements

(b) velocity of light

(c) changes in refractive indices

(d) surface irregularities

Options :

1. (a) and (b) are true

2. (b) and (c) are true

3. (c) and (d) are true

4. (d) and (a) are false

Question Number : 119 Question Id : 7621612279 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Incentive spirometer is used to

Options :

1. measure volume of air inspired only

2. measure volume of air expired only

3. measure volume of air inspired & expired

4. improve lungs function

Question Number : 120 Question Id : 7621612280 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In measuring and visualizing blood flow, the mode of ultra sound sonography used is

Options :

1. Doppler mode

2. Motion mode

3. C mode

4. B mode