Question Paper Preview

Question Paper Name: Instrumentation Engineering 12th May 2018 Shift 1
Subject Name: Instrumentation Engineering
Duration: 120

Instrumentation Engineering

Display Number Panel: Yes
Group All Questions: No

Question Number : 1 Question Id : 2203607081 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Let $A=\begin{bmatrix}3 & 1 & 4\\ 0 & 2 & 6\\ 0 & 0 & 5\end{bmatrix}$. Then one of the eigen vectors of A is

Options :

1. $\begin{pmatrix}3\\2\\1\end{pmatrix}$

2. $\begin{pmatrix}3\\1\\0\end{pmatrix}$

3. $\begin{pmatrix}0\\1\\0\end{pmatrix}$

4. $\begin{pmatrix}0\\0\\1\end{pmatrix}$

Question Number : 2 Question Id : 2203607082 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $f = \tan^{-1}\frac{y}{x}$ then div (grad f) is equal to

Options :

1. 1

2. -1

3. 0

4. 2

Question Number : 3 Question Id : 2203607083 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A conservative force field is

Options :

1. unit normal

2. solenoidal

3. irrotational

4. normal

Question Number : 4 Question Id : 2203607084 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The integration factor of the differential equation $\frac{dy}{dx} + \frac{y}{x} = x^2y^6$ is

Options :

1. $logx$

2. x

3. x^{-5}

4. $\frac{1}{x}$

Question Number : 5 Question Id : 2203607085 Question Type : MCQ Option Shuffling : Yes Display Question Nu Single Line Question Option : No Option Orientation : Vertical

If y_1 and y_2 are two linearly independent solutions of $\frac{d^2y}{dx^2} + 4y = \tan 2x$ then the Wronskian of y_1 and y_2 is

Options :

1. 4

2. -4

3. 2

4. -2

Question Number : 6 Question Id : 2203607086 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

$\oint_C \frac{z^2+z}{(z-1)} dz$, where c is the circle $|z| = 2$ is

Options :

1. $2\pi i$

2. $4\pi i$

3. 0

4. πi

Question Number : 7 Question Id : 2203607087 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The probability that a leap year selected at random will contain 53 Sundays is

Options :

1. $\frac{1}{7}$

2. $\frac{53}{366}$

3. $\frac{2}{7}$

4. $\frac{2}{53}$

Question Number : 8 Question Id : 2203607088 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If a variable X satisfies the Poisson distribution with a mean value of 2 then probability that X > 2 is

Options :

1. $2e^{-2}$

2. $1 - 2e^{-2}$

3. $3e^{-2}$

4. $1 - 3e^{-2}$

Question Number : 9 Question Id : 2203607089 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A real root of the equation $x^3 - x - 11 = 0$ lies between

Options :

1. 0 and 1

2. 1 and 2

3. 2 and 3

4. 3 and 4

Question Number : 10 Question Id : 2203607090 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The Newton-Raphson iterative formula to find $\sqrt{N}$ is

Options :

1. $x_{n+1} = \frac{1}{2}(x_n + \frac{N}{x_n})$

2. $x_{n+1} = \frac{1}{2}(x_n - \frac{N}{x_n})$

3. $x_{n+1} = \frac{1}{2}(x_n + \frac{1}{Nx_n})$

4. $x_{n+1} = \frac{1}{2}(x_n - \frac{1}{Nx_n})$

Question Number : 11 Question Id : 2203607091 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The condition for maximum power transfer in the circuit is

Options :

1. the load impedance is equal to equivalent impedance of the network

2. the load impedance is more than equivalent impedance of the network

3. the load impedance is complex conjugate of equivalent impedance of the network

4. the load impedance is less than equivalent impedance of the network

Question Number : 12 Question Id : 2203607092 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A series RLC circuit has a resonance of 1 kHz and a quality factor Q = 100. If each R, L, and C is doubled from its original value, the new Q of the circuit is

Options :

1. 25

2. 50

3. 100

4. 200

Question Number : 13 Question Id : 2203607093 Question Type : MCQ Option Shuffling : Yes Display Question N Single Line Question Option : No Option Orientation : Vertical

A 0-300 V voltmeter has an error of ±2% of full scale deflection. What would be the range of readings if true voltage is 30 V?

Options :

1. 24 V – 36 V

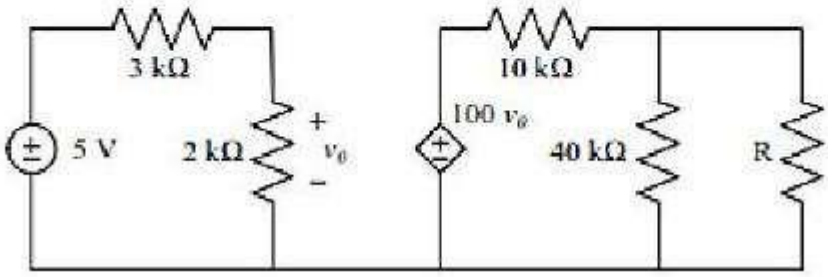
2. 29.4 V – 30.6 V

3. 20 V – 40 V

4. 24 V – 40 V

Question Number : 14 Question Id : 2203607094 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In the circuit shown in the figure, the maximum power (in watt) delivered to the resistor R is _____.



Options :

1. 0.8

2. 0.08

3. 1.8

4. 8

Question Number : 15 Question Id : 2203607095 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An independent voltage source in series with an impedance $Z_s = R_s = jX_s$ delivers a maximum average power to a load impedance Z_L when

Options :

1. $Z_L = Rs + jX_s$

2. $Z_L = R_s$

3. $Z_L = jX_s$

4. $Z_L = R_s = jX_s$

Question Number : 16 Question Id : 2203607096 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following represents relation for kinematic viscosity?

Options :

1. Absolute density/mass density

2. Absolute density × mass density

3. Absolute density × $(\text{mass density})^2$

4. Absolute density/$(\text{mass density})^2$

Question Number : 17 Question Id : 2203607097 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A piezoelectric type transducer has a sensitivity of 100 mV/g. The transducers is subjected to a constant acceleration of 5 g. The steady state output of the transducer will be

Options :

1. Zero

2. 100 mV

3. 0.5 V

4. 5 V

Question Number : 18 Question Id : 2203607098 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The output voltage of an LVDT is 1.5 V at maximum displacement. At a load of 0.5 Ω, the deviation from linearity is maximum and it is ±0.003 V from a straight line through origin. The linearity at the given load is

Options :

1. ±0.4%

2. ±0.2%

3. ±0.3%

4. ±1.5%

Question Number : 19 Question Id : 2203607099 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The lower limit at useful working range of a transducer is determined by

Options :

1. Minimum useful input level

2. Transducer error and noise

3. Cross sensitivity

4. Dynamic response

Question Number : 20 Question Id : 2203607100 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A copper-constant thermocouple was found to have a linear calibration between 0°C and 400°C with emf at maximum temperature (reference junction temperature 0°C) equal to 20.68 mV. If the indicated emf is 8.92 mV in thermocouple circuit, determine the temperature of hot junction.

Options :

1. 197.53°C

2. 179.53°C

3. 157.53°C

4. 193.53°C

Question Number : 21 Question Id : 2203607101 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The cell constant is defined as the ratio of

Options :

1. area of either electrodes to the length between the electrodes

2. length between the electrodes to the area of either electrodes

3. length between the electrodes to the volume of either electrode

4. resistivity to conductivity

Question Number : 22 Question Id : 2203607102 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A conveyor belt is travelling at a speed of 32 cm/s and a load cell with length of 0.8 is reading 6.0 kg. What is the flow rate of material on the belt?

Options :

1. 2.4 kg/s

2. 1.2 kg/s

3. 4.8 kg/s

4. 6.4 kg/s

Question Number : 23 Question Id : 2203607103 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The seismic mass of an accelerometer oscillates sinusoidally at 100 Hz with a maximum displacement of 10 mm from its mean position. The peak acceleration of the seismic mass is

Options :

1. $3141.50\ m/s^2$

2. $314.15\ m/s^2$

3. $100.00\ m/s^2$

4. $3947.84\ m/s^2$

Question Number : 24 Question Id : 2203607104 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A Transducer is subjected to a sudden change in the measurand. It takes 10 seconds to reach the steady state condition. How long will it take to read half the measurand?

Options :

1. 5 sec.

2. 2.5 sec.

3. 2.39 sec.

4. 1.39 sec.

Question Number : 25 Question Id : 2203607105 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Dummy strain gauge is used in conjunction with the main strain gauge to

Options :

1. reduce strain on the gauge

2. improve sensitivity

3. calibrate the system

4. compensate temperature effects

Question Number : 26 Question Id : 2203607106 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

When the temperature of the thermocouple measuring junction is lower than the reference junction, then,

Options :

1. There is no emf output

2. The output voltage polarity is reversed

3. The polarity stays the same, but voltage increases

4. The emf remains the same when temperature changes

Question Number : 27 Question Id : 2203607107 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A peizoelectric type pressure sensor has a sensitivity of 1 mV/kPa and a bandwidth of 300 Hz to 300 kHz. For a constant pressure of 100 kPa, the steady state output of the sensor in millivolt is _____.

Options :

1. 0

2. 100 mV

3. 0.1 V

4. cannot be determined

Question Number : 28 Question Id : 2203607108 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Dunmore hygrometer exhibits

Options :

1. linear resistance versus relative humidity characteristics

2. non-linear resistance versus relative humidity characteristics

3. linear inductance versus relative humidity characteristics

4. non-linear inductance versus relative humidity characteristics

Question Number : 29 Question Id : 2203607109 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The pressure and velocity at the throat of a Venturi tube, measuring the flow of a liquid are related to the upstream pressure and velocity, respectively, as follows:

Options :

1. pressure is lower but velocity is higher

2. pressure is higher but velocity is lower

3. both pressure and velocity are lower

4. pressure and velocity are identical

Question Number : 30 Question Id : 2203607110 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which one of the following is an inverse transducer?

Options :

1. Potentiometer

2. LVDT

3. Piezo electric crystal

4. RTD

Question Number : 31 Question Id : 2203607111 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A moving iron voltmeter is connected across the voltage source whose instantaneous value is $v(t) = 5 + 10\cos(314t + 30^\circ)$. The meter reading is

Options :

1. 15 V

2. 5 V

3. √75 V

4. √125 V

Question Number : 32 Question Id : 2203607112 Question Type : MCQ Option Shuffling : Yes 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 impedance source

4. a constant power source

Question Number : 33 Question Id : 2203607113 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In which of the liquid level gauges, the Geiger Mueller tube is used?

Options :

1. Ultrasonic level gauge

2. Capacitive level gauge

3. Microwave level gauge

4. Gamma rays level gauge

Question Number : 34 Question Id : 2203607114 Question Type : MCQ Option Shuffling : Yes Display Question N... Single Line Question Option : No Option Orientation : Vertical

An ultrasonic flow meter with the transducers separated by a distance L = 25 mm with the line joining the transducers making an angle 600 with the direction of the flow. The transit time difference between upstream and downstream measurements is 10 ns with the sound velocity in the medium being 1000 m/s. Assuming that the size of the transducers is very small as compared to the diameter of the pipe, the flow velocity is

Options :

1. 0.2 m/s

2. 2 m/s

3. 0.4 m/s

4. 40 m/s

Question Number : 35 Question Id : 2203607115 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The pressure drop across an orifice plate for a particular flow rate is 5 kg/m^2. If the flow rate is doubled (within the operating range of the orifice), the corresponding pressure drop in kg/m^2 is,

Options :

1. 2.5

2. 5.0

3. 20.0

4. 25.0

Question Number : 36 Question Id : 2203607116 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Thermal run away is not possible in FET because as the temperature of FET increases

Options :

1. the mobility decreases

2. the transconductance increases

3. the drain current increases

4. the mobility increases

Question Number : 37 Question Id : 2203607117 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The effect of current shunt feedback in an amplifier is to

Options :

1. increase the input resistance and decrease the output resistance

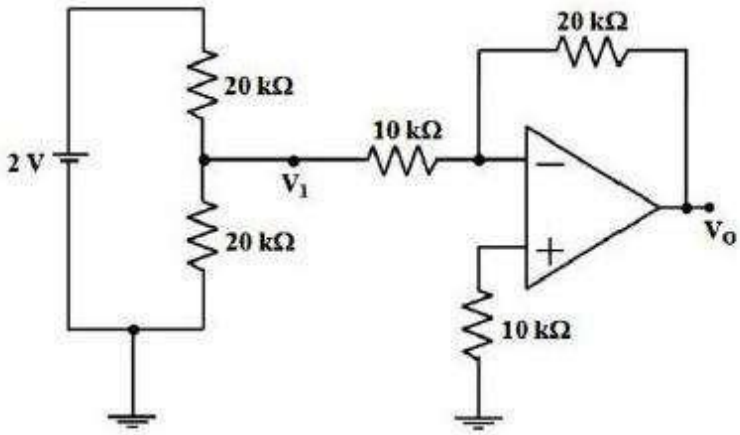
2. increase both input resistance and output resistance

3. decrease both input resistance and output resistance

4. decrease the input resistance and increase the output resistance

Question Number : 38 Question Id : 2203607118 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In the circuit given below, the op-amp is ideal. The output voltage V_o in volt is,



Options :

1. -1

2. 1.5

3. 4

4. 1

Question Number : 39 Question Id : 2203607119 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The feedback factor of Wien bridge oscillator using OP-AMP is

Options :

1. 1/3

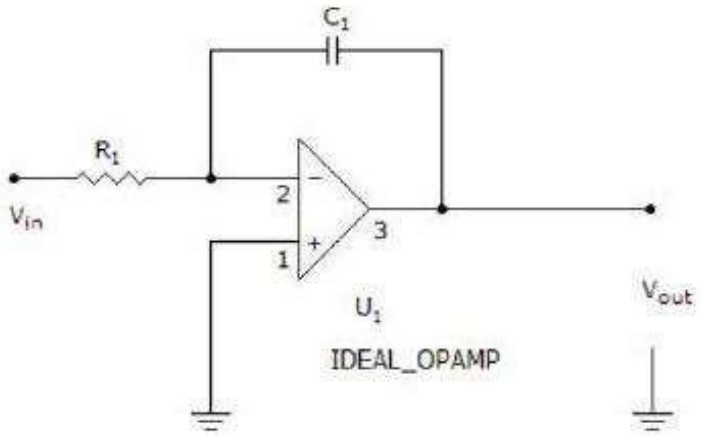
2. 1/4

3. 1/2

4. 1

Question Number : 40 Question Id : 2203607120 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The output waveform of the below circuit will be



Options :

1. sine

2. square

3. sawtooth

4. triangle

Question Number : 41 Question Id : 2203607121 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The decimal equivalent of the hexadecimal number E5 is

Options :

1. 279

2. 229

3. 427

4. 472

Question Number : 42 Question Id : 2203607122 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A full adder can be implemented with half – adders and OR gates. A four bit parallel full adder without any initial carry requires

Options :

1. 7-half-adders, 3-OR gates

2. 8-half-adders, 3-OR gates

3. 8-half-adders, 4-OR gates

4. 7-half-adders, 4-OR gates

Question Number : 43 Question Id : 2203607123 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For a D/A converter, the resolution required is 50 mV and the total maximum input is 10 V. The number of bits required is

Options :

1. 7

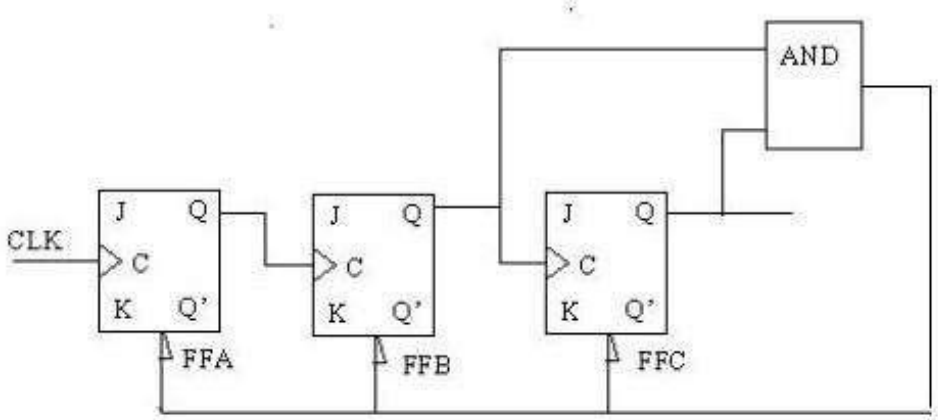
2. 9

3. 8

4. 10

Question Number : 44 Question Id : 2203607124 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The sequential circuit is a



Options :

1. serial input shift register

2. divide by 6 counter

3. divide by 3 counter

4. synchronous counter

Question Number : 45 Question Id : 2203607125 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In 8086 microprocessor, if the code segment register contains 1FAB and IP register contains 10A1, the effective memory address is

Options :

1. 20B51

2. 304C1

3. 2BC01

4. 2DB51

Question Number : 46 Question Id : 2203607126 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The 2's complement representation of $(-539)_{10}$ in hexadecimal is

Options :

1. ABE

2. DBC

3. DE5

4. 9E7

Question Number : 47 Question Id : 2203607127 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In a microprocessor, the register which holds the address of the next instruction to be fetched is

Options :

1. accumulator

2. program counter

3. stack pointer

4. instructor register

Question Number : 48 Question Id : 2203607128 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A 4 bit modulo- 16 ripple counter used J-K flip-flops. If propagation delay of each flip-flop is 50 ms, then maximum clock frequency is equal to

Options :

1. 20 MHz

2. 10 MHz

3. 5 MHz

4. 4 MHZ

Question Number : 49 Question Id : 2203607129 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The subroutine SBX given below is executed by an 8085 microprocessor. The value in the accumulator immediately after the execution of the subroutine will be

```
SBX:  MVIA, 99H
      ADI  11H
      MOV C, A
       RET
```

Options :

1. 00H
2. 11H
3. 99H
4. AAH

Question Number : 50 Question Id : 2203607130 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The internal data memory of 8051 microcontroller has

Options :

1. 256 bytes
2. 128 bytes
3. 4 kB
4. 2 kB

Question Number : 51 Question Id : 2203607131 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Frequency domain of a periodic triangular function is a

Options :

1. discrete sine function
2. continuous sampling function

3. discrete sampling function

4. continuous sampling square function

Question Number : 52 Question Id : 2203607132 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In non coherent reception of FSK, _____ is measured.

Options :

1. phase

2. energy

3. power

4. amplitude

Question Number : 53 Question Id : 2203607133 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The trigonometric Fourier series of a periodic time function can have only

Options :

1. cosine terms

2. sine terms

3. cosine and sine terms

4. DC and cosine terms

Question Number : 54 Question Id : 2203607134 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A quantizer operates at a sampling frequency of 16 kHz. What is its Nyquist limit?

Options :

1. 64 kHz

2. 32 kHz

3. 16 kHz

4. 8 kHz

Question Number : 55 Question Id : 2203607135 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The Fourier series of a real periodic function has any

Options :

1. cosine terms if it is even

2. sine terms if it is even

3. cosine terms if it is odd

4. sine terms if it is odd

Question Number : 56 Question Id : 2203607136 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In Chebyshev filter poles lie on the

Options :

1. Circle

2. Ellipse

3. Parabola

4. unit circle

Question Number : 57 Question Id : 2203607137 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

DFT of unit sample sequence is

Options :

1. 0

2. 1

3. ∞

4. 2

Question Number : 58 Question Id : 2203607138 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

$y(n) = x^2(n)$ system is

Options :

1. Causal

2. Dynamic

3. Non-causal

4. Linear

Question Number : 59 Question Id : 2203607139 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The radix-2 FFT algorithm is one which requires N the sequence length to be

Options :

1. A multiple of 2

2. Divisible by 2

3. A power of 2

4. At least equal to 2

Question Number : 60 Question Id : 2203607140 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

It is possible to compute the cross correlation Rxy(z) between two signals x(t) and y(t) directly from their convolution provided

Options :

1. X(t) has even symmetry

2. X(t) has odd symmetry

3. Y(t) has odd symmetry

4. Y(t) has even symmetry

Question Number : 61 Question Id : 2203607141 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If M and N are the orders of numerator and denominator of rational system function respectively, then how many multiplications are required in direct form-I realization of that IIR filter?

Options :

1. $M + N - 1$

2. $M + N$

3. $M + N + 1$

4. $M + N + 2$

Question Number : 62 Question Id : 2203607142 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the given signals are periodic?

Options :

1. $x(t) = 4\cos(5\pi t)$

2. $x(t) = u(t) - 1/2$

3. $x(t) = 4u(t) + 2\sin(3t)$

4. $x(t) = 2\sin(3t)$

Question Number : 63 Question Id : 2203607143 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Pulse Amplitude modulation (PAM) signals can be demodulated by using a

Options :

1. differentiator followed by a LPF

2. low Pass filter alone

3. Schmitt trigger followed by a LPF

4. clipper circuit followed by a LPF

Question Number : 64 Question Id : 2203607144 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The output of a linear system to a unit step u(t) is t^2e^t. The system function H(s) is

Options :

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

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

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

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

Question Number : 65 Question Id : 2203607145 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The fundamental period of $x(t) = 2\sin(2\pi t) + 3\sin(3\pi t)$, where t expressed in seconds, is

Options :

1. 2s

2. 0.67s

3. 1s

4. 3s

Question Number : 66 Question Id : 2203607146 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The controlling torque in a megger is provided by

Options :

1. springs

2. weights attached to the moving system

3. it does not need any controlling torque

4. springs and pointer

Question Number : 67 Question Id : 2203607147 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

High range can be obtained in a basic D.C. electronic voltmeter by

Options :

1. a transformer

2. an attenuator

3. a transducer

4. a resistor

Question Number : 68 Question Id : 2203607148 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A practical Q meter consists of _____.

Options :

1. Wien bridge oscillator

2. AF oscillator

3. RF oscillator

4. Crystal oscillator

Question Number : 69 Question Id : 2203607149 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Maxwell's inductance capacitance bridge is used for measurement of inductance of

Options :

1. low Q coils

2. medium Q coils

3. high Q coils

4. low and medium Q coils

Question Number : 70 Question Id : 2203607150 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In Wheatstone bridge all resistors are of RΩ and the battery has zero internal resistance. Then, the galvanometer resistance for maximum sensitivity of bridge will be

Options :

1. R Ω

2. 1.5RΩ

3. 2R Ω

4. 4R Ω

Question Number : 71 Question Id : 2203607151 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If the secondary burden of a current transformer is 15 VA and secondary current is 5 A, then the impedance of the connected load will be

Options :

1. 6 Ω

2. 0.6 Ω

3. 5 Ω

4. 10 Ω

Question Number : 72 Question Id : 2203607152 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A Kelvin double bridge is best suited for the measurement of

Options :

1. very high resistance

2. Inductance

3. high resistance

4. low resistance

Question Number : 73 Question Id : 2203607153 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A DC ammeter has a resistance of 0.1 Ω and the current range is 1-100 A. If the range is to be extended to 0-500 A, the meter requires which of the following shunt resistance?

Options :

1. 0.010 Ω

2. 0.011 Ω

3. 0.025 Ω

4. 1.0 Ω

Question Number : 74 Question Id : 2203607154 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The input voltage for starting the oscillation in an oscillator is caused by

Options :

1. Notch filter

2. Phase shifter

3. Kelvin bridge

4. High pass filter

Question Number : 75 Question Id : 2203607155 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In measurements made using a Q-meter, high impedance elements should preferably be connected in

Options :

1. star

2. delta

3. series

4. parallel

Question Number : 76 Question Id : 2203607156 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A 0-300 V voltmeter has guaranteed accuracy of 1% full scale reading. The voltage measured by the instrument is 83 V. The percent limiting error is

Options :

1. 0.95

2. 1.81

3. 3.62

4. 4.85

Question Number : 77 Question Id : 2203607157 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A slide wire potentiometer has 10 wires of 1 m each. With the help of a standard voltage source of 1.018 V it is standardized by keeping the wiper at 101.8 cm. If the resistance of the potentiometer wires is 1000 ohm, then the value of the working current is

Options :

1. 0.1 mA

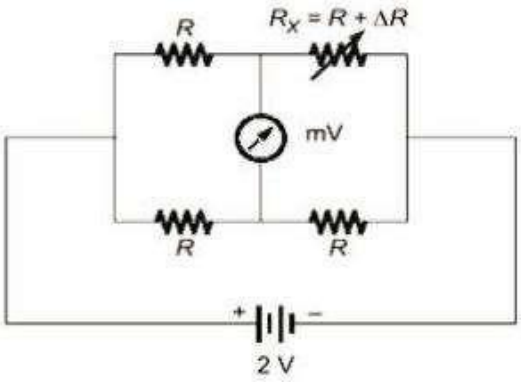
2. 0.5 mA

3. 1 mA

4. 10 mA

Question Number : 78 Question Id : 2203607158 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The unbalanced voltage of the Wheatstone bridge, shown in the figure is measured using a digital voltmeter having infinite input impedance and a resolution of 0.1 mV. If R = 1000 Ω then the minimum value of ΔR in Ω to create a detectable unbalanced voltage is,



Options :

1. 0.2
2. 2
3. 20
4. 0.02

Question Number : 79 Question Id : 2203607159 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A wattmeter has a current coil of 0.03 Ω resistances and pressure coil of 6000 Ω resistance. Calculate the percentage error if the wattmeter is so connected that the current coil is on the load side. If the load takes 20 A at a voltage of 220 V and 0.6 p.f.

Options :

1. 4.5%
2. 0.45%
3. 5.4%
4. 45%

Question Number : 80 Question Id : 2203607160 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The Hay's bridge operating at a supply frequency of 100 Hz is balanced when the components are $C_3 = 0.1\ \mu F$, $R_1 = 1.26\ k\Omega$, $R_3 = 75\ \Omega$ and $R_4 = 500\ \Omega$. Calculate the inductance of the coil.

Options :

1. 0.6 mH

2. 6 μH

3. 6 mH

4. 60 H

Question Number : 81 Question Id : 2203607161 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The sweep generator of a CRO is used to produce

Options :

1. Sinusoidal voltage for the horizontal deflection of electron beam

2. Saw tooth voltage for the vertical deflection of electron beam

3. Sinusoidal voltage for the vertical deflection of electron beam

4. Saw tooth voltage for the horizontal deflection of electron beam

Question Number : 82 Question Id : 2203607162 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A single phase energy meter is operating on a 240 V, 50 Hz supply with a load of 25 A for a 2 hours at unity power factor. The meter makes 1500 revolutions in that period. The meter constant is

Options :

1. 0.125 rev/kW-h

2. 125 rev/kW-h

3. 750 rev/kW-h

4. 1/125 rev/kW-h

Question Number : 83 Question Id : 2203607163 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wagner's earth devices used on AC bridge circuit for

Options :

1. eliminating the effect of inter-component capacitances

2. eliminating the effect of strong electrostatic fields

3. shielding the bridge elements

4. eliminating the effect of each capacitance

Question Number : 84 Question Id : 2203607164 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Two voltmeters of 0-300 V range are connected in parallel to an ac circuit. One voltmeter is moving iron type and reads 200 V, the other meter is moving coil type, the reading will be,

Options :

1. $200\sqrt{3}$

2. 200×1.4 V

3. slightly less than 200 V

4. zero

Question Number : 85 Question Id : 2203607165 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The standardization of a.c potentiometers is done by

Options :

1. directly using a.c. standard voltage sources

2. using d.c. standard sources and transfer instruments

3. using d.c. standard sources and d'Arsonval galvanometer

4. using a.c. standard sources and transfer instruments

Question Number : 86 Question Id : 2203607166 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The system in originally critically damped, if the gain is doubled the system will be

Options :

1. remains same

2. overdamped

3. under damped

4. undamped

Question Number : 87 Question Id : 2203607167 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The characteristic equation of a system is given as $3s^4 + 10s^3 + 5s^2 + 2 = 0$. This system is

Options :

1. stable

2. marginally stable

3. unstable

4. conditionally stable

Question Number : 88 Question Id : 2203607168 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Offset can be eliminated with the help of controllers

Options :

1. D-action

2. I-action

3. P-action

4. ON-OFF action

Question Number : 89 Question Id : 2203607169 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The frequency at which the Nyquist diagram crosses the negative real axis is known as

Options :

1. gain crossover frequency

2. phase crossover frequency

3. damping frequency

4. natural frequency

Question Number : 90 Question Id : 2203607170 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The phase margin of a system with the open loop transfer function given below is

$$G(s)H(s) = \frac{(1-s)}{(1+s)(2+s)}$$

Options :

1. 90°

2. ∞

3. 63.4°

4. 0°

Question Number : 91 Question Id : 2203607171 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The root locus plot of the system having loop transfer function

$$G(s)H(s) = \frac{k}{s(s+4)(s^2+4s+5)}$$

Options :

1. No breakaway point

2. Only one breakaway point

3. Three real breakaway points

4. One real and two complex breakaway points

Question Number : 92 Question Id : 2203607172 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In the Bode-plot of a unity feedback control system, the value of phase of G(jw) at the given crossover frequency is –125°. The phase margins of the system is

Options :

1. –125°

2. –55°

3. +55°

4. +125°

Question Number : 93 Question Id : 2203607173 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A linear discrete-time system has the characteristic equation $z^3 - 0.81z = 0$. The system is

Options :

1. stable

2. marginally stable

3. unstable

4. stability cannot be determined from the given data

Question Number : 94 Question Id : 2203607174 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which one of the following is an advantage of P + D controller in terms of damping (δ) and natural frequency (ω_n)?

Options :

1. δ remains fixed but ω_n increases

2. δ remains fixed but ω_n decreases

3. δ increases but ω_n remains fixed

4. δ decreases but ω_n remains fixed

Question Number : 95 Question Id : 2203607175 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of these devices is used for sequence control, tuning, counting and data calculation in a process

Options :

1. SCADA

2. DCS

3. PLC

4. DDC

Question Number : 96 Question Id : 2203607176 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Identify the sequence of operation in fuzzy control

a) rule base b) fuzzification c) fuzzy inference d) defuzzification

Options :

1. a, b, c, d

2. b, a, c, d

3. b, a, d, c

4. a, c, b, d

Question Number : 97 Question Id : 2203607177 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For a unity feedback system with open loop gain $G(s) = \frac{9}{s(s+3)}$, the closed loop system will have a damping ratio of

Options :

1. 0.33

2. 0.5

3. 1.0

4. 3

Question Number : 98 Question Id : 2203607178 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The phase cross-over frequency of the transfer function $G(s) = \frac{100}{(s+1)^3}$

Options :

1. $\sqrt{3}$

2. $\frac{1}{\sqrt{3}}$

3. 3

4. $3\sqrt{3}$

Question Number : 99 Question Id : 2203607179 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A unity feedback system has a forward path transfer function $G(s) = \frac{10}{s(s+5)}$. It is subjected to a unit ramp input. The Integral of the Squared Error (ISE) is

Options :

1. zero
2. infinite
3. always negative
4. 0.5

Question Number : 100 Question Id : 2203607180 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

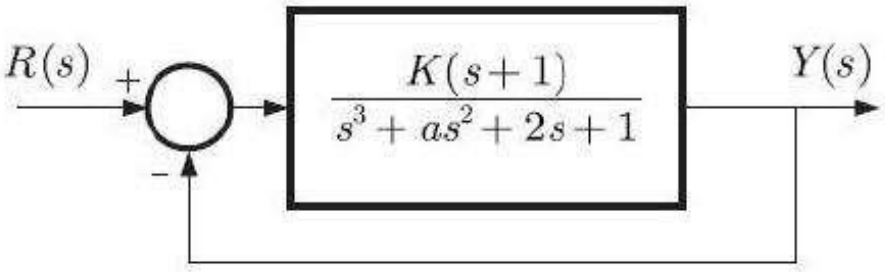
The impulse response of a discrete LTI system is u(n). The system

Options :

1. is unstable in the sense of bounded input bounded output
2. produces bounded outputs for all bounded inputs
3. produces bounded inputs for all bounded outputs
4. stability properties cannot be commented upon

Question Number : 101 Question Id : 2203607181 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The feedback system shown below oscillates at 2 rad/s when



Options :

1. $K = 2$ and $a = 0.75$

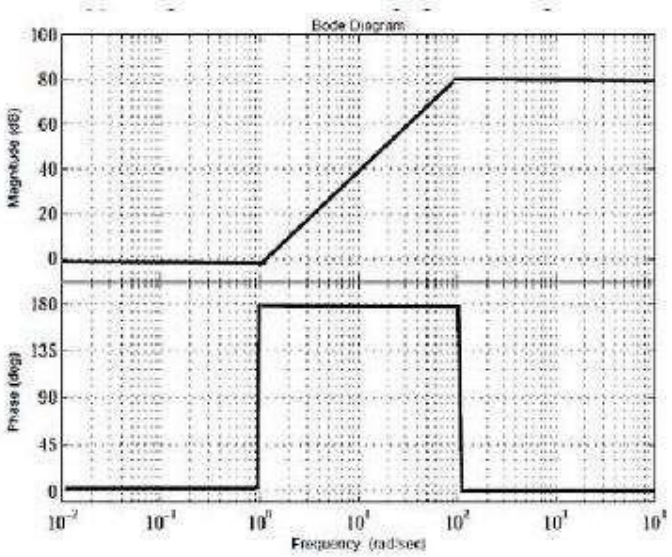
2. $K = 3$ and $a = 0.75$

3. $K = 4$ and $a = 0.5$

4. $K = 2$ and $a = 0.5$

Question Number : 102 Question Id : 2203607182 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The transfer function G(s) of a system which has the asymptotic Bode plot shown below is



Options :

1. $10^4 \frac{(s-1)^2}{(s+100)^2}$

2. $10^4 \frac{(s+1)^2}{(s+100)^2}$

3. $10^4 \frac{(s+1)}{(s+100)^2}$

4. $10^4 \frac{(s-1)^2}{(s-100)^2}$

Question Number : 103 Question Id : 2203607183 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A system is described by the state equation

$$\begin{bmatrix}\dot{x}_1\\ \dot{x}_2\end{bmatrix}=\begin{bmatrix}2 & 0\\ 0 & 2\end{bmatrix}\begin{bmatrix}x_1\\ x_2\end{bmatrix}+\begin{bmatrix}1\\ 1\end{bmatrix}u$$

The state transition matrix of the system is

Options :

1. $\begin{bmatrix}e^{2t} & 0\\ 0 & e^{2t}\end{bmatrix}$

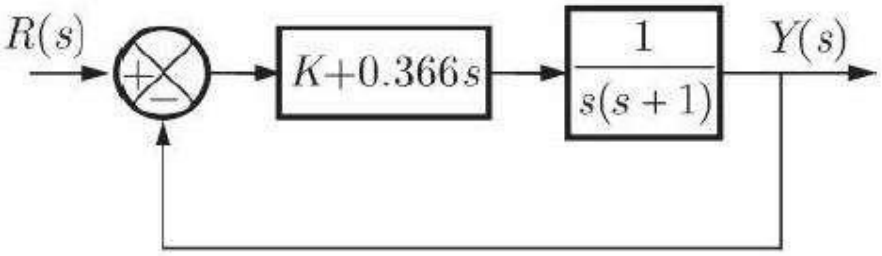
2. $\begin{bmatrix}e^{-2t} & 0\\ 0 & e^{-t}\end{bmatrix}$

3. $\begin{bmatrix}e^{2t} & 1\\ 1 & e^{2t}\end{bmatrix}$

4. $\begin{bmatrix}e^{-2t} & 1\\ 1 & e^{-t}\end{bmatrix}$

Question Number : 104 Question Id : 2203607184 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If the compensated system shown in the figure has a phase margin of 60° at the crossover frequency of 1 rad/sec, then value of the gain K is



Options :

1. 0.366

2. 0.732

3. 1.366

4. 2.738

Question Number : 105 Question Id : 2203607185 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A unity feedback control loop with an open-loop transfer function of the form $\frac{K}{(s+\alpha)}$ has a gain crossover frequency of 1 rad/sec and a phase margin of 60°. If an element having a transfer function $\frac{s-\sqrt{3}}{s+\sqrt{3}}$ is inserted into the loop, the phase margin will become

Options :

1. 0°

2. 30°

3. 45°

4. 60°

Question Number : 106 Question Id : 2203607186 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Beer's law states that the intensity of light decreases with respect to _____.

Options :

1. Concentration

2. Distance

3. Composition

4. Volume

Question Number : 107 Question Id : 2203607187 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Basically ultrasonic sound waves are _____.

Options :

1. Voltage signals

2. Pressure waves

3. Current

4. Radiation

Question Number : 108 Question Id : 2203607188 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following is used in tomography?

Options :

1. IR radiation

2. UV radiation

3. Gamma radiation

4. X-ray radiation

Question Number : 109 Question Id : 2203607189 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

While measuring speed with a stroboscope, synchronism has been obtained at the flashing rates of 25 and 20 pulses per second. The speed of rotation is

Options :

1. 0.6 rev/min

2. 50 rev/min

3. 100 rev/min

4. 6000 rev/min

Question Number : 110 Question Id : 2203607190 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The longitudinal mode separation in a gas laser with cavity length of 0.4 m (given velocity of light = 3×10^8 m/sec) is

Options :

1. 374 MHz

2. 375 MHz

3. 748 MHz

4. 750 MHz

Question Number : 111 Question Id : 2203607191 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An apparatus to capture ECG signals has a filter followed by data acquisition system. The filter best suited for this application is

Options :

1. Low pass filter with cutoff frequency 200 Hz

2. High pass filter with cutoff frequency 200 Hz

3. Band pass filter with lower and upper cutoff frequencies 100 Hz and 200 Hz for its pass band

4. Band reject filter with lower and upper cutoff frequencies 1 Hz and 200 Hz for its stop band

Question Number : 112 Question Id : 2203607192 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Korotkoff sounds are used

Options :

1. as a reference for sound level measurement

2. for studying heart muscle functioning

3. for blood pressure measurement

4. for study of heart valve functioning

Question Number : 113 Question Id : 2203607193 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In Fick's method of cardiac output measurement, oxygen consumption is 200 mL/min, arterial oxygen content is 0.30 mL/mL and venous oxygen is 0.20 mL/mL. The cardiac output is L/min is

Options :

1. 1

2. 2

3. 0.5

4. 1.5

Question Number : 114 Question Id : 2203607194 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

When the reading of a pH meter changes from 5 to 7, the hydrogen ion concentration of the solution is

Options :

1. halved

2. doubled

3. increased 100 times

4. decreased 100 times

Question Number : 115 Question Id : 2203607195 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The transmittance of a coloured solution is 0.5. The absorbance of the solution is

Options :

1. 0.3

2. 0.69

3. 3.16

4. −1.5

Question Number : 116 Question Id : 2203607196 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

_____ & _____ act as ionising gas in Geiger Muller counter for nuclear radiation detection?

Options :

1. Argon & Alcohol

2. Krypton & Hydrogen

3. Xenon & Argon

4. Hydrogen & Argon

Question Number : 117 Question Id : 2203607197 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Calculate the maximum transmission distance for a fiber link with attenuation of 0.5 dB/km, if the power launched is 1 mW and receiver sensitivity is 50 μW.

Options :

1. 24 km

2. 14 km

3. 26 km

4. 34 km

Question Number : 118 Question Id : 2203607198 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The responsivity of a photodiode is 0.85 A/W and the input-power saturation is 1.5 mW. What is the photocurrent if the incident light power is 1 mW?

Options :

1. 0.85 mA

2. 85 mA

3. 8.5 mA

4. 75 mA

Question Number : 119 Question Id : 2203607199 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

When the optical power incident on a photo diode is 10 μW and the responsivity is 0.8 A/W, the photo current generated is

Options :

1. 0.08 μA

2. 8 μA

3. 80 μA

4. 0.008 μA

Question Number : 120 Question Id : 2203607200 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In ion spectroscopy, the positive ions are focused on the sample at an angle of

Options :

1. 20°

2. 30°

3. 45°

4. 90°