

Andhra Pradesh State Council of Higher Education

Notations :

- 1.Options shown in green color and with ✓ icon are correct.
- 2.Options shown in red color and with ✘ icon are incorrect.

Question Paper Name :	EI2
Subject Name :	Instrumentation Engineering
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Instrumentation Engineering

Group Number :	1
Group Id :	83189673
Group Maximum Duration :	0
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Show Attended Group? :	No
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Instrumentation Engineering

Section Id : 83189673
Section Number : 1
Section type : Online
Mandatory or Optional : Mandatory
Number of Questions : 120
Number of Questions to be attempted : 120
Section Marks : 120
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Sub-Section Number : 1
Sub-Section Id : 83189673
Question Shuffling Allowed : Yes

Question Number : 1 Question Id : 8318968641 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The gage factor of semiconductor strain gauge is higher than ordinary metal wire resistive strain gauge because of:

Options :

1. ✓ piezoresistive effect
2. ✘ temperature effect

zener breakdown in the material

3. ✘

its small size

4. ✘

Question Number : 2 Question Id : 8318968642 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Gauge factor of strain gauge indicates its:

Options :

accuracy

1. ✘

sensitivity

2. ✔

Dead zone

3. ✘

Precision

4. ✘

Question Number : 3 Question Id : 8318968643 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Dummy strain gauge is used:

Options :

1. ✘ to increase sensitivity
2. ✘ to measure tensile strength
3. ✔ for temperature compensation
4. ✘ to measure compressive strain

Question Number : 4 Question Id : 8318968644 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The gauge factor of semiconductor strain gauge is in the range of:

Options :

1. ✘ 2 to 10
2. ✔ 100 to 150
3. ✘ more than 200

4. ✘ 50 to 100

Question Number : 5 Question Id : 8318968645 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The input impedance of CRO is nearly:

Options :

1. ✘ Zero
2. ✘ Around 10Ω
3. ✘ Around 100Ω
4. ✔ Around $1M\Omega$

Question Number : 6 Question Id : 8318968646 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The principle of operation of LVDT is based on the operation of:

Options :

1. ✘ self-inductance
2. ✔ mutual inductance
3. ✘ reluctance
4. ✘ permeance

Question Number : 7 Question Id : 8318968647 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following will be the best selection for the core of an LVDT?

Options :

1. ✘ Air
2. ✔ Nickel-iron
3. ✘ Rubber

Platinum

4. ✘

Question Number : 8 Question Id : 8318968648 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The devices which are used for the measurement of very high temperature are:

Options :

1. ✘ Thermistors

2. ✘ Thermocouples

3. ✔ Pyrometers

4. ✘ RTD's

Question Number : 9 Question Id : 8318968649 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

An example of variable area device for measuring flow is:

Options :

1. ✘ Flow nozzle
2. ✘ Orifice meter
3. ✘ Venturi meter
4. ✔ Rotameter

Question Number : 10 Question Id : 8318968650 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In a venturimeter, the flow is $0.15 \text{ m}^3 / \text{s}$ when the differential pressure is 30 kN/m^2 . What is the flow when the differential pressure is 60 kN/m^2 ?

Options :

1. ✔ $0.212 \text{ m}^3 / \text{s}$
2. ✘ $0.106 \text{ m}^3 / \text{s}$

3. ✘ $0.3 \text{ m}^3 / \text{s}$

4. ✘ $0.075 \text{ m}^3 / \text{s}$

Question Number : 11 Question Id : 8318968651 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A variable reluctance types tachometer has 60 rotor slots. If counter records 3600 counter per second, then the speed is:

Options :

1. ✘ 60 rpm

2. ✘ 360 rpm

3. ✘ 1800 rpm

4. ✔ 3600 rpm

Question Number : 12 Question Id : 8318968652 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A force digital transducers measures the pressure in the range of 0-200 N with a resolution of 0.1% of full scale. The smallest charge it can measure is:

Options :

1. ✓ 0.2 N
2. ✗ 0.4 N
3. ✗ 0.5 N
4. ✗ 1.0 N

Question Number : 13 Question Id : 8318968653 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Value of pH solution is 4. It indicates that concentration of hydrogen ions is:

Options :

1. ✓ 10^{-4} g/l and the solution is acidic
2. ✗ 10^{-4} g/l and the solution is alkaline
3. ✗ 10^{-4} mg/l and the solution is acidic
4. ✗ 10^{-4} mg/l and the solution is alkaline

Question Number : 14 Question Id : 8318968654 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following is used to measure the thermal conductivity?

Options :

1. ✗ RTD
2. ✗ Thermocouple
3. ✗ Strain gauge

Thermistor

4. ✓

Question Number : 15 Question Id : 8318968655 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The resistance of thermistor is 5000Ω at 20°C and its resistance temperature coefficient is $0.04/^\circ\text{C}$. A measurement with a lead resistance of 10Ω will cause an error of:

Options :

1. ✓ 0.05°C 2. ✗ 0.1°C 3. ✗ 0.4°C 4. ✗ 0.8°C

Question Number : 16 Question Id : 8318968656 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following is inverse transducer?

Options :

1. ✓ Piezoelectric
2. ✗ Thermistor
3. ✗ Photovoltaic cell
4. ✗ LVDT

Question Number : 17 Question Id : 8318968657 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Psychrometer is used for the measurement of:

Options :

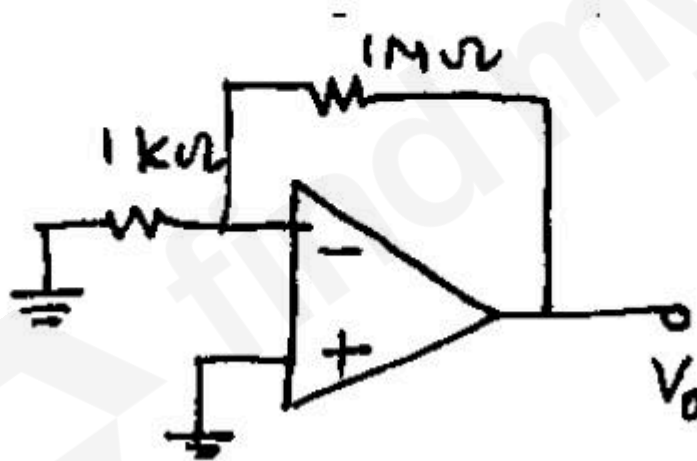
1. ✗ pH
2. ✗ Viscosity

3. ✘ Conductivity

4. ✔ Humidity

Question Number : 18 Question Id : 8318968658 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

An op-amp has an offset voltage of 1 mV and is ideal in all other respects. If this op-amp is used in the circuit shown in figure below, the output voltage will be (select the nearest value)



Options :

1. ✘ 1 mV

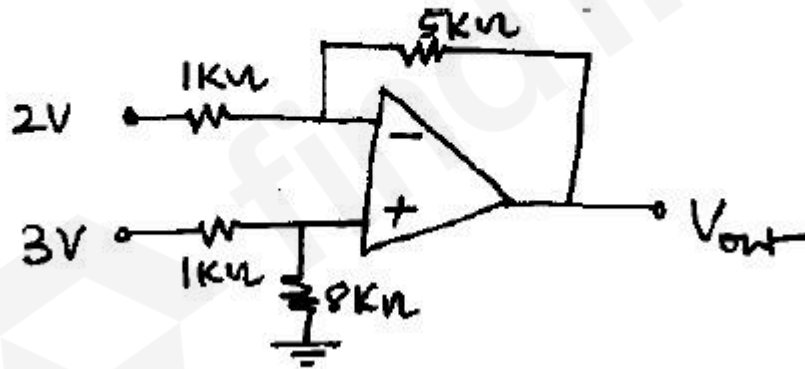
2. ✘ 1 V

3. ✔ ± 1 V

4. ✘ ± 5 V

Question Number : 19 Question Id : 8318968659 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

If the op-amp in figure is ideal, the output voltage V_{out} will be equal to:



Options :

1. ✘ 1 V

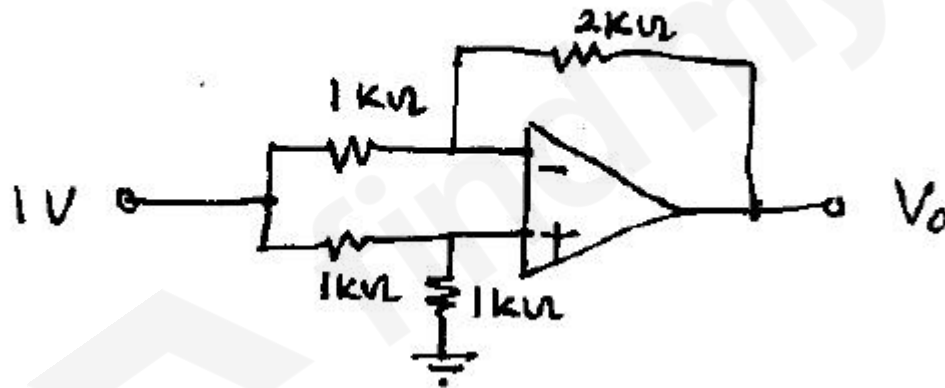
2. ✓ 6 V

3. ✗ 14 V

4. ✗ 17 V

Question Number : 20 Question Id : 8318968660 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

For the op-amp circuit shown in the figure below, V_o is:



Options :

1. ✗ -2 V

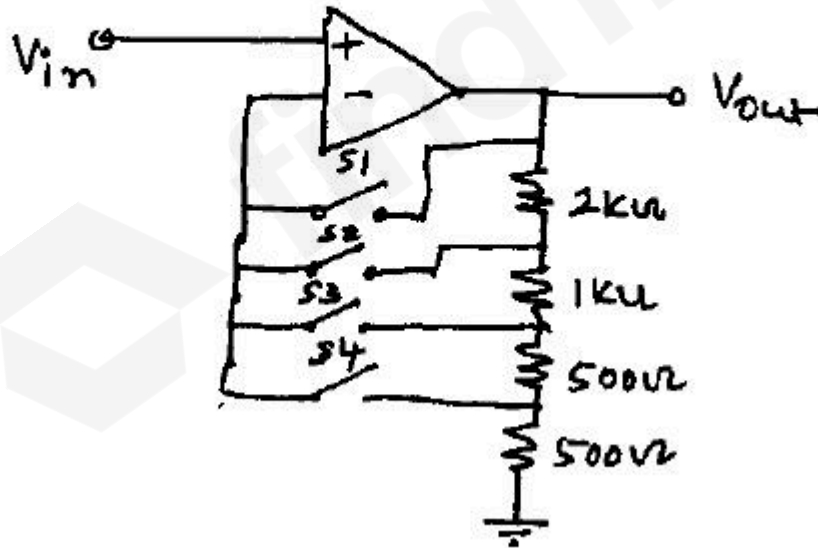
2. ✘ -1 V

3. ✔ -0.5 V

4. ✘ 0.5 V

Question Number : 21 Question Id : 8318968661 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

When the switch S_2 is closed, the gain of the programmable gain amplifier shown in the following figure is:



Options :

1. ✘ 0.5
2. ✔ 2
3. ✘ 4
4. ✘ 8

Question Number : 22 Question Id : 8318968662 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If the differential voltage gain and the common mode voltage gain of the differential amplifier are 48 dB and 2 dB respectively then its common mode rejection ratio is:

Options :

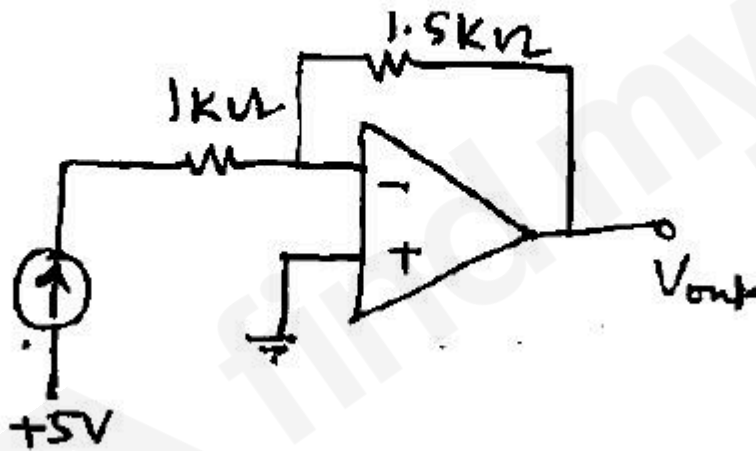
1. ✘ 23 dB
2. ✘ 25 dB

3. ✓ 46 dB

4. ✗ 50 dB

Question Number : 23 Question Id : 8318968663 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

The op-amp and the 1 mA current source in the circuit of figure are ideal. The output of the op-amp is:



Options :

1. ✗ -1.5 mA

2. ✓ -1.5 V

3. ✗ -7.5 V

4. ✗ +1.5 V

Question Number : 24 Question Id : 8318968664 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A 741-type op-amp has a gain bandwidth product of 1 MHz. A non-inverting amplifier using this op-amp and having a voltage gain of 20 dB will exhibit a 3 dB bandwidth of:

Options :

1. ✗ 50 kHz

2. ✓ 100 kHz

3. ✗ 1000/17 kHz

4. ✘ 1000/7.07 kHz

Question Number : 25 Question Id : 8318968665 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

What is the order of minimum displacement that can be measured with capacitive transducer?

Options :

1. ✘ 1 cm

2. ✘ 1 mm

3. ✘ 1 μm

4. ✔ 1×10^{-8} m

Question Number : 26 Question Id : 8318968666 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Capacitive transducers are normally used for:

Options :

1. ✘ static measurement
2. ✘ dynamic measurement
3. ✔ both static and dynamic measurements
4. ✘ transient measurement

Question Number : 27 Question Id : 8318968667 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

To reduce the effect of fringing in a capacitive type transducer,

Options :

1. ✘ The transducer is shielded and the shield is kept at ground potential
2. ✘ A guard ring is provided and it is kept at ground potential

3. ✘ The transducer is shielded and the shield is kept at the same potential as the moving plate

4. ✔ A guard ring is provided and it is kept at the same potential as the moving plate

Question Number : 28 Question Id : 8318968668 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Piezoelectric transducers are:

Options :

1. ✘ passive transducers

2. ✘ active transducers

3. ✘ inverse transducers

4. ✔ both active and inverse transducers

Question Number : 29 Question Id : 8318968669 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Piezoelectric crystals produce an EMF when:

Options :

1. ✓ an external mechanical force is applied to it
2. ✘ an external magnetic field is applied
3. ✘ a radiant energy stimulates the crystal
4. ✘ the junction of two such crystals is heated

Question Number : 30 Question Id : 8318968670 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The least suitable transducer for static pressure measurement is:

Options :

1. ✘ semiconductor strain gauge
2. ✘ variable capacitor transducer

3. ✘ metal wire strain gauge
4. ✔ piezoelectric transducer

Question Number : 31 Question Id : 8318968671 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A linear variable differential transformer (LVDT) is:

Options :

1. ✘ an impedance matching transformer
2. ✔ a displacement transducer
3. ✘ a differential temperature sensor
4. ✘ an auto transformer

Question Number : 32 Question Id : 8318968672 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A properly biased JFET will act as a:

Options :

1. ✘ Current controlled current source
2. ✘ Voltage controlled voltage source
3. ✔ Voltage controlled current source
4. ✘ Current controlled voltage source

Question Number : 33 Question Id : 8318968673 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The type of power amplifier which exhibits crossover distortion in its output is:

Options :

1. ✘ Class A

2. ✓ Class B

3. ✘ Class AB

4. ✘ Class C

Question Number : 34 Question Id : 8318968674 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which one of the following oscillators is used for generation of high frequencies?

Options :

1. ✘ R.C. phase shift

2. ✘ Wien-bridge

3. ✓ L.C. oscillator

4. ✘ Blocking oscillator

Question Number : 35 Question Id : 8318968675 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

What is the main advantage of a JFET-cascade amplifier?

Options :

1. ✓ High voltage gain
2. ✗ Low output impedance
3. ✗ Very low input capacitance
4. ✗ High input impedance

Question Number : 36 Question Id : 8318968676 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A differential amplifier has $R_L = 10 \text{ k}\Omega$ (equal values in both collectors). $h_{ie} = 1 \text{ k}\Omega$, $R_e = 50 \text{ k}\Omega$, $h_{fe} = 100$. The common mode is given by:

Options :

1. ✘ 1500
2. ✘ 20
3. ✘ 0.2
4. ✔ 0.1

Question Number : 37 Question Id : 8318968677 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The open loop voltage gain of an amplifier is 240. The noise level in the output without feedback is 100 mV. If a negative feedback with $\beta = 1/60$ is used, the noise level in the output will be:

Options :

1. ✘ 1.66 mV
2. ✘ 2.4 mV

3. ✘ 4.0 mV

4. ✔ 20 mV

Question Number : 38 Question Id : 8318968678 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

PMMC type instrument normally used for:

Options :

1. ✘ air friction damping

2. ✘ fluid friction damping

3. ✔ eddy current damping

4. ✘ under damped system

Question Number : 39 Question Id : 8318968679 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Kelvin's double bridge is used for the measurement of:

Options :

1. ✘ High resistance
2. ✘ Medium resistance
3. ✔ Low resistance
4. ✘ Mega-Ohm range resistance

Question Number : 40 Question Id : 8318968680 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Two resistance $100 \pm 5\Omega$ and $150 \pm 15\Omega$ are connected in series. If the errors are specified as standard deviations, the resultant error will be:

Options :

1. ✘ $\pm 10\Omega$

2. ✘ $\pm 10.6\Omega$

3. ✔ $\pm 15.8\Omega$

4. ✘ $\pm 20\Omega$

Question Number : 41 Question Id : 8318968681 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A PMMC meter rated at $100\ \mu\text{A}$ is used in a rectifier type of instrument which uses full wave rectification. What is the sensitivity on sinusoidal AC?

Options :

1. ✘ $4.5\ \text{k}\Omega/\text{V}$

2. ✘ $18\ \text{k}\Omega/\text{V}$

3. ✘ $10\ \text{k}\Omega/\text{V}$

4. ✓ 9 k Ω /V

Question Number : 42 Question Id : 8318968682 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

When testing a coil having a resistance of 10 Ω , resonance occurred when the oscillator frequency was 10 MHz and the rotating capacitor was set at $500/2\pi$ pF. The effective value of the Q of the coil is:

Options :

1. ✓ 200

2. ✗ 254

3. ✗ 314

4. ✗ 542

Question Number : 43 Question Id : 8318968683 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The resistance can be measured most accurately by:

Options :

1. ✘ Voltmeter-ammeter method
2. ✔ Bridge method
3. ✘ Multi-meter
4. ✘ Megger

Question Number : 44 Question Id : 8318968684 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Schering bridge is used to:

Options :

1. ✔ determine capacitance
2. ✘ determine the inductance

3. ✘ measure low resistance
4. ✘ measure mutual inductance

Question Number : 45 Question Id : 8318968685 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

X and Y plates of a CRO are connected to unequal voltages of equal frequency with phase shift of 90° . The Lissajous pattern observed on the CRO screen is_____.

Options :

1. ✘ circle
2. ✘ straight line
3. ✔ ellipse
4. ✘ figure of eight

Question Number : 46 Question Id : 8318968686 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Q meter operates on the principle of:

Options :

1. ✓ series resonance
2. ✗ current resonance
3. ✗ self-inductance
4. ✗ eddy currents

Question Number : 47 Question Id : 8318968687 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The transmittance of a particular solution measured is T . The concentration of the solution is now doubled. Assuming that Beer-Lambert's law holds good for both the cases, the transmittance for the second would be:

Options :

1. ✘ $\frac{T}{2}$
2. ✘ $2T$
3. ✔ T^2
4. ✘ \sqrt{T}

Question Number : 48 Question Id : 8318968688 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In a spectrophotometer, the monochromator must be able to resolve two wavelengths 599.9 nm and 600.1 nm. The required resolution is:

Options :

1. ✘ 100
2. ✘ 500

3. ✘ 1000

4. ✔ 3000

Question Number : 49 Question Id : 8318968689 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following is the value for the action potential of a cell?

Options :

1. ✘ 0.70 mV

2. ✘ -20 mV

3. ✔ +20 mV

4. ✘ +50 mV

Question Number : 50 Question Id : 8318968690 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The mathematical basic for Nuclear Magnetic Resonance (NMR) states that if μ is the nuclear magnetic moment of the molecule, the gyromagnetic ratio is proportional to:

Options :

1. ✓ μ

2. ✗ $\left[\frac{1}{\mu}\right]$

3. ✗ $\sqrt{\mu}$

4. ✗ μ^2

Question Number : 51 Question Id : 8318968691 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Normal diastolic blood pressure ranges from (in mm Hg):

Options :

1. ✘ 0-30
2. ✘ 30-60
3. ✔ 60-90
4. ✘ 90-120

Question Number : 52 Question Id : 8318968692 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The counter method used for counting of the blood cells is based in the principle of the:

Options :

1. ✔ electrical conductivity
2. ✘ volume

3. ✘ weight

4. ✘ number of blood cells

Question Number : 53 Question Id : 8318968693 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

On testing a blood sample it is found that it contains 15g of Hb per decilitre of blood sample and a PVC of 0.45. Find the mean cell haemoglobin concentration for the blood sample:

Options :

1. ✔ 33.3 g/dl

2. ✘ 28.3 g/dl

3. ✘ 33.9 g/dl

4. ✘ 31.2 g/dl

Question Number : 54 Question Id : 8318968694 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A good indicator of cardiovascular system is:

Options :

1. ✓ blood pressure
2. ✘ water flow
3. ✘ heart beat
4. ✘ brain

Question Number : 55 Question Id : 8318968695 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following type of image is produced by CT scan machine?

Options :

1. ✘ 1-D image

2. ✘ 2-D image
3. ✔ 3-D image
4. ✘ 4-D image

Question Number : 56 Question Id : 8318968696 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following is a preferred electrode for measuring EMG?

Options :

1. ✘ Surface electrodes
2. ✔ Needle electrodes
3. ✘ Pregelled electrodes
4. ✘ Scalp electrodes

Question Number : 57 Question Id : 8318968697 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

When intramuscular EMG is required to look into the electrical activities of deeper or overlaid muscles, _____ electrodes are used.

Options :

1. ✘ plate shape electrodes
2. ✘ surface electrodes
3. ✘ thin thread electrodes
4. ✔ fine wire electrodes

Question Number : 58 Question Id : 8318968698 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The contraction of the skeletal muscles results in the generation of action potential in the individual muscle fibers. Record of this action potential is called _____.

Options :

1. ✘ ECG
2. ✔ EMG
3. ✘ EEG
4. ✘ EKG

Question Number : 59 Question Id : 8318968699 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Disturbance in the EEG pattern resulting from the external stimuli is called _____.

Options :

1. ✘ provoked response
2. ✘ ckooored response
3. ✔ evoked response

4. ✘ impulse response

Question Number : 60 Question Id : 8318968700 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which rhythm is the principal component of the EEG that indicates the alertness of the brain?

Options :

1. ✘ Theta rhythm

2. ✘ Gamma rhythm

3. ✘ Beta rhythm

4. ✔ Alpha rhythm

Question Number : 61 Question Id : 8318968701 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Normal EEG frequency range is _____.

Options :

1. ✘ 50 – 500 Hz
2. ✔ 0.5 – 50 Hz
3. ✘ 0.05 – 5 Hz
4. ✘ 1 – 200 Hz

Question Number : 62 Question Id : 8318968702 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following is a wireless ECG acquiring system?

Options :

1. ✘ Pregelled disposable electrodes
2. ✘ Limb electrodes
3. ✘ Paste less electrodes

4. ✓ Smart pad

Question Number : 63 Question Id : 8318968703 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Recording electrical activities associated with heart is known as _____.

Options :

1. ✘ EEG

2. ✘ EOG

3. ✘ EMG

4. ✓ ECG

Question Number : 64 Question Id : 8318968704 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Welsh cup electrodes have _____.

Options :

1. ✘ low contact impedance
2. ✘ negligible contact impedance
3. ✔ high contact impedance
4. ✘ zero contact impedance

Question Number : 65 Question Id : 8318968705 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In X-ray spectrometers, the specimen or the sample is placed after which of the following components?

Options :

1. ✔ X-ray tube
2. ✘ Monochromator

3. ✘ Collimator

4. ✘ Detector

Question Number : 66 Question Id : 8318968706 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In calibration of a dynamometer Wattmeter by potentiometer, phantom loading arrangement is used because:

Options :

1. ✘ the arrangement gives accurate results
2. ✔ the power consumed in calibration work is minimum
3. ✘ the method gives quick results
4. ✘ the onsite calibration is possible

Question Number : 67 Question Id : 8318968707 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In electrodynamicometer type wattmeter, the inductance of pressure coil produces error. The error is:

Options :

1. ✘ constant irrespective of the power factor of the load
2. ✘ higher at higher power factor loads
3. ✔ higher at lower power factor loads
4. ✘ highest at unity power factor loads

Question Number : 68 Question Id : 8318968708 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The phenomena of 'creeping' occurs in:

Options :

1. ✘ Ammeters

2. ✘ Voltmeters

3. ✔ Wattmeters

4. ✘ Watt-hour meters

Question Number : 69 Question Id : 8318968709 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A moving-coil instrument gives full-scale deflection for 1 mA and has a resistance of 5 Ω . If a resistance of 0.55 Ω is connected in parallel to the instrument, what is the maximum value of current it can measure?

Options :

1. ✘ 5 mA

2. ✔ 10 mA

3. ✘ 50 mA

4. ✘ 100 mA

Question Number : 70 Question Id : 8318968710 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In a permanent magnet moving coil instrument, if the control spring is replaced by another one having a higher spring constant, then the natural frequency and damping ratio will:

Options :

1. ✘ decrease

2. ✔ increase and decrease respectively

3. ✘ decrease and increase respectively

4. ✘ increase

Question Number : 71 Question Id : 8318968711 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Rectifier moving coil instrument responds to:

Options :

1. ✘ peak value, irrespective of the nature of the waveform
2. ✔ average value, for all waveforms
3. ✘ rms value, for all waveforms
4. ✘ rms value, for symmetrical square waveforms

Question Number : 72 Question Id : 8318968712 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

For increasing the range of voltmeter, connect a:

Options :

1. ✔ high value resistance in series with voltmeter
2. ✘ low value resistance in series with voltmeter

3. ✘ high value resistance in parallel with voltmeter
4. ✘ low value resistance in parallel with voltmeter

Question Number : 73 Question Id : 8318968713 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

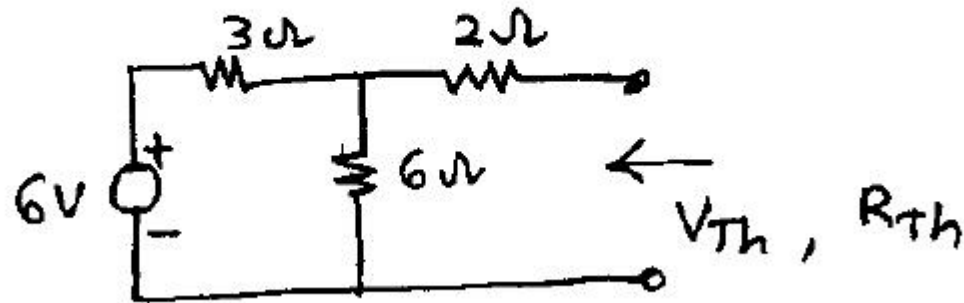
A dual-trace CRO has:

Options :

1. ✘ one electron gun
2. ✔ two electron guns
3. ✘ one electron gun and one two pole switch
4. ✘ two electron guns and one two pole switch

Question Number : 74 Question Id : 8318968714 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Find V_{Th} and R_{Th} in the figure is given below.

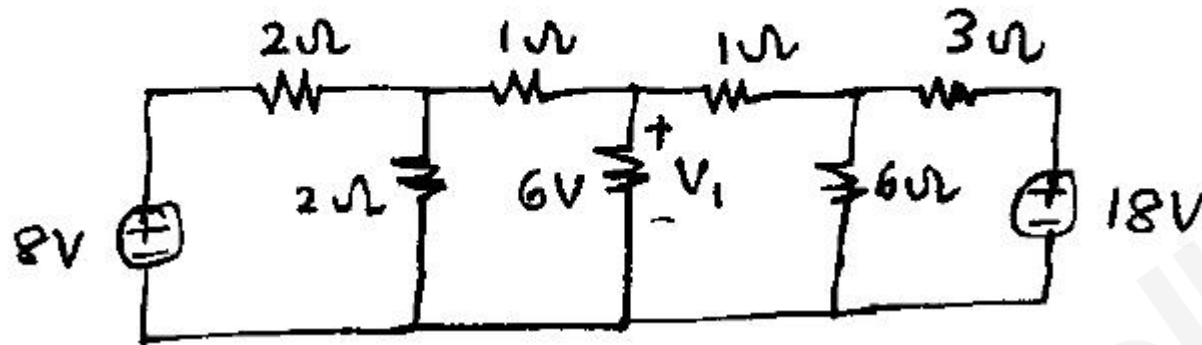


Options :

1. ✘ 2V, 4Ω
2. ✔ 4V, 4 Ω
3. ✘ 6V, 4 Ω
4. ✘ 2V, 5 Ω

Question Number : 75 Question Id : 8318968715 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
 Correct Marks : 1 Wrong Marks : 0

In the below circuit, the value of V_1 is:

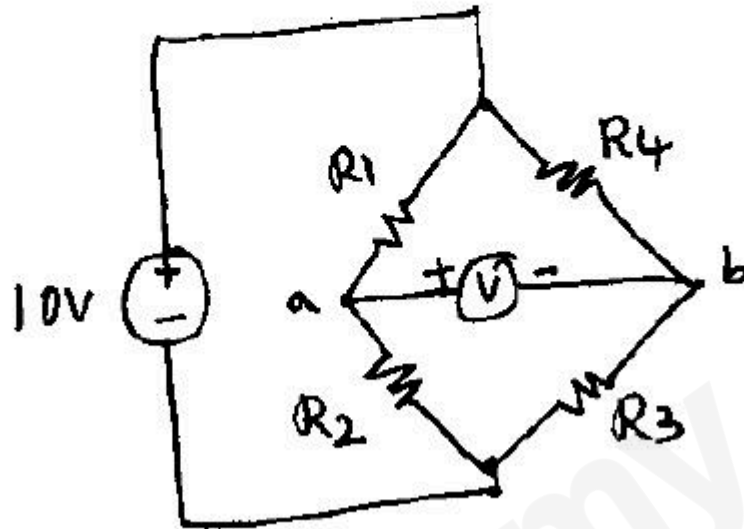


Options :

1. ✓ 6 V
2. ✗ 7V
3. ✗ 8V
4. ✗ 10V

Question Number : 76 Question Id : 8318968716 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
 Correct Marks : 1 Wrong Marks : 0

If $R_1 = R_2 = R$ and $R_3 = 1.1R_4$ in the bridge circuit shown in figure, then the reading in the ideal voltmeter connected between a and b is:



Options :

1. ✘ 0.238 V
2. ✘ 0.138 V
3. ✔ -0.238 V

4. ✘ 1 V

Question Number : 77 Question Id : 8318968717 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The energy required to charge a $10\mu\text{F}$ capacitor to 100V is:

Options :

1. ✘ 0.10 J

2. ✔ 0.05 J

3. ✘ 5×10^{-9} J

4. ✘ 10×10^{-9} J

Question Number : 78 Question Id : 8318968718 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A $100\ \Omega$, 1 W resistor and a $800\ \Omega$, 2 W resistor are connected in series. The maximum DC voltage that can be applied continuously to the series circuit without exceeding the power limit of any of the resistors is:

Options :

1. ✘ 90 V
2. ✘ 50 V
3. ✔ 45 V
4. ✘ 40 V

Question Number : 79 Question Id : 8318968719 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

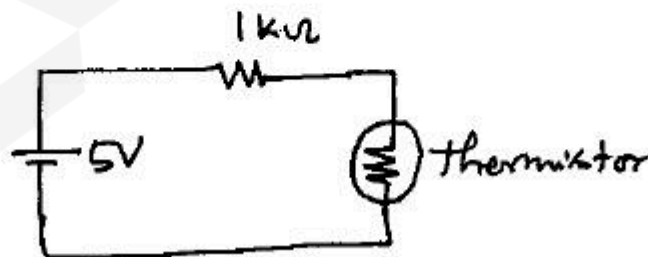
A piezoelectric type accelerator has a sensitivity of $100\ \text{mV/g}$. The transducer is subjected to a constant acceleration of $5\ \text{g}$. The steady state output of the transducer will be:

Options :

1. ✘ Zero
2. ✘ 100 mV
3. ✔ 0.5 V
4. ✘ 5 V

Question Number : 80 Question Id : 8318968720 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
 Correct Marks : 1 Wrong Marks : 0

A thermistor has a resistance of $10\text{k}\Omega$ at 25°C and $1\text{k}\Omega$ at 100°C . The range of operation is 0°C to 150°C . The excitation voltage is 5V and a series resistor of $1\text{k}\Omega$ is connected to the thermistor. The power dissipated in the thermistor is



Options :

1. ✘ 4.0 mW
2. ✘ 4.7 mW
3. ✘ 5.4 mW
4. ✔ 6.1 mW

Question Number : 81 Question Id : 8318968721 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following logics possesses highest noise immunity?

Options :

1. ✘ DTL
2. ✔ HTL
3. ✘ ECL

TTL

4. ✘

Question Number : 82 Question Id : 8318968722 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

What decides the bit size of 8085 up?

Options :

- 1. ✘ Data bus
- 2. ✘ Address bus
- 3. ✘ Control bus
- 4. ✔ ALU

Question Number : 83 Question Id : 8318968723 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

What is the maximum addressing capacity of 8085 microprocessor?

Options :

1. ✓ 64 KB
2. ✘ 32 KB
3. ✘ 16 KB
4. ✘ 8 KB

Question Number : 84 Question Id : 8318968724 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The number of hardware interrupt (which require an external signal to interrupt) present in an 8085 microprocessor are?

Options :

1. ✘ 1
2. ✘ 4

3. ✓ 5

4. ✘ 13

Question Number : 85 Question Id : 8318968725 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

What is the vector address of RST 6.5 interrupt?

Options :

1. ✘ 002CH

2. ✓ 0034H

3. ✘ 0038H

4. ✘ 003CH

Question Number : 86 Question Id : 8318968726 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

How many special function registers are there in 8051 microcontroller

Options :

1. ✘ 10
2. ✔ 20
3. ✘ 30
4. ✘ 40

Question Number : 87 Question Id : 8318968727 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

The binary representation of the decimal number 1.375 is

Options :

1. ✘ 1.111
2. ✘ 1.010

3. ✓ 1.011

4. ✗ 1.001

Question Number : 88 Question Id : 8318968728 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following controller produces zero offset?

Options :

1. ✗ Proportional

2. ✗ Derivative

3. ✓ Integral

4. ✗ Proportional - Derivative

Question Number : 89 Question Id : 8318968729 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The maximum phase shift that can be provided by a lead compensator with transfer function $G(s) = \frac{1 + 6s}{1 + 2s}$ is

Options :

1. ✘ 15°
2. ✔ 30°
3. ✘ 45°
4. ✘ 60°

Question Number : 90 Question Id : 8318968730 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If the characteristic equation of a closed-loop system is

$s^2 + 2s + 2 = 0$, then the system is:

Options :

1. ✘ overdamped
2. ✘ critically damped

3. ✓ underdamped

4. ✘ un-damped

Question Number : 91 Question Id : 8318968731 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The Bode plot of the transfer function $G(s) = 5$ is :

Options :

1. ✘ constant magnitude and constant phase shift angle

2. ✘ -20dB/decade and constant phase shift

3. ✓ +20dB/decade and constant phase shift of $\pi/2$

4. ✘ zero magnitude and phase shift

Question Number : 92 Question Id : 8318968732 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The type denotes the number of:

Options :

1. ✘ Poles of infinity
2. ✔ Poles of origin
3. ✘ Zeros of infinity
4. ✘ Zeros of origin

Question Number : 93 Question Id : 8318968733 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In majority of instruments damping is provided by :

Options :

1. ✘ Fluid friction
2. ✘ Spring
3. ✔ Eddy currents

Counter weights

4. ✘

Question Number : 94 Question Id : 8318968734 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

What determines the light intensity in a CRT?

Options :

1. ✘ Voltage

2. ✘ Current

3. ✘ Screen

4. ✔ Momentum of electrons

Question Number : 95 Question Id : 8318968735 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

An ideal op-amp has CMRR:

Options :

1. ✘ Unity

2. ✘ -1

3. ✔ Infinity

4. ✘ Zero

Question Number : 96 Question Id : 8318968736 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following is the best method for determining the stability and transient response?

Options :

1. ✔ Root locus

2. ✘ Bode plot

3. ✘ Nyquist plot

Polar plots

4. ✘

Question Number : 97 Question Id : 8318968737 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A $10\mu\text{F}$ capacitance charged to 10V has a stored charge equal to:

Options :

1. ✘ $10\mu\text{C}$

2. ✔ $100\mu\text{C}$

3. ✘ $200\mu\text{C}$

4. ✘ 100C

Question Number : 98 Question Id : 8318968738 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The internal resistance of armature should ideally be:

Options :

1. ✓ Zero
2. ✘ Very large
3. ✘ Very small
4. ✘ Infinite

Question Number : 99 Question Id : 8318968739 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Hot wire anemometer is used to measure:

Options :

1. ✘ Pressure in gases
2. ✘ Liquid discharges
3. ✓ Gas velocities
4. ✘ Wind velocities

Question Number : 100 Question Id : 8318968740 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The electrical output down a thermocouple circuit is detected by using:

Options :

1. ✘ Wheatstone bridge
2. ✔ Voltage balancing circuit
3. ✘ Current sensitive device
4. ✘ Current balancing circuit

Question Number : 101 Question Id : 8318968741 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Load cells are used for measurement of :

Options :

1. ✘ Strain

2. ✘ Stress
3. ✘ Velocity
4. ✔ Weight

Question Number : 102 Question Id : 8318968742 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A dead weight tester is used for:

Options :

1. ✔ Calibrating pressure gauges
2. ✘ Testing the Magnitude of given weight
3. ✘ Providing high pressures
4. ✘ Measurement of Load

Question Number : 103 Question Id : 8318968743 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which instrument has the manual Null balance operation?

Options :

1. ✓ Optical pyrometer

2. ✗ Resistance Thermometer

3. ✗ Glass Thermometer

4. ✗ Thermistor

Question Number : 104 Question Id : 8318968744 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Flapper nozzle is used un following controller?

Options :

1. ✗ Hydraulic

2. ✘ Electric
3. ✔ Pneumatic
4. ✘ Electronic

Question Number : 105 Question Id : 8318968745 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The most common pneumatic signal standard for industrial process instruments is:

Options :

1. ✘ (0-20)psi
2. ✔ (3-15)psi
3. ✘ (4-20)psi
4. ✘ (0-10)psi

Question Number : 106 Question Id : 8318968746 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Cavitation in a control valve is caused by:

Options :

1. ✘ Process noise
2. ✘ Vibration in pipe
3. ✘ The Von karman effect
4. ✔ Pressure recovery

Question Number : 107 Question Id : 8318968747 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Photo conductive cells are made by:

Options :

1. ✔ Lead sulphide

2. ✘ Tin sulphide
3. ✘ Zinc sulphide
4. ✘ Magnesium sulphide

Question Number : 108 Question Id : 8318968748 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A system defined by the difference equation $y(n) = x(-n)$ is:

Options :

1. ✘ casual but not stable
2. ✔ non-casual but stable
3. ✘ casual as well as stable
4. ✘ non-casual as well as not stable

Question Number : 109 Question Id : 8318968749 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A linear discrete time system has the characteristics equation,
 $z^3 - 0.81z = 0$, the system is:

Options :

1. ✓ stable
2. ✗ marginally stable
3. ✗ unstable
4. ✗ stability cannot be assessed from the given information

Question Number : 110 Question Id : 8318968750 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Kirchhoff's current law is valid for:

Options :

1. ✗ DC circuit only

2. ✘ AC circuit only
3. ✔ Both DC and AC circuits
4. ✘ Sinusoidal source only

Question Number : 111 Question Id : 8318968751 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If $A = \begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix}$ is a 2×2 matrix, then the eigenvalues of the matrix $2A^2 - 4A + 5I$ are _____, where I is the 2×2 unit matrix.

Options :

1. ✘ $2 \pm i$
2. ✔ $3 \pm 4i$
3. ✘ $3 \pm 2i$

4. ✘ $-3 \pm i$

Question Number : 112 Question Id : 8318968752 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If (a, b, c) is the unique solution of the system of linear equations

$$x + y + z = 2, 2x + y - z = 3, 3 + 2y + z = 4,$$

then $b^2 + c^2 = \underline{\hspace{2cm}}$

Options :

1. ✘ 5

2. ✘ 15

3. ✔ 17

4. ✘ 20

Question Number : 113 Question Id : 8318968753 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Let $f(x) = x^3 - \frac{9}{2}x^2 + 6x - 2$ be a function defined on the closed interval $[0,3]$. Then, the global maximum value of $f(x)$ is _____

Options :

1. ✘ 4.5
2. ✘ 0.5
3. ✔ 2.5
4. ✘ 3.0

Question Number : 114 Question Id : 8318968754 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The directional derivative of $f(x, y, z) = xyz$ at the point $(1,2,3)$ in the direction of the vector $2\hat{i} + \hat{j} - 2\hat{k}$ is _____

Options :

1. ✘ $\frac{5}{3}$

2. ✘ $\frac{-5}{3}$

3. ✔ $\frac{11}{3}$

4. ✘ $\frac{19}{3}$

Question Number : 115 Question Id : 8318968755 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
 Correct Marks : 1 Wrong Marks : 0

If C is the boundary of the region enclosed by the curves $y = \sqrt{x}$ and $y = x^2$, then the value of the line integral

$\int_C (3x^2 - 8y^2)dx + (4y - 6xy)dy$ is _____

Options :

1. ✘ $\frac{7}{2}$

2. ✔ $\frac{3}{2}$

3. ✘ $\frac{3}{10}$

4. ✘ $\frac{7}{10}$

Question Number : 116 Question Id : 8318968756 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
 Correct Marks : 1 Wrong Marks : 0

The particular integral of the differential equation

$$\frac{d^2y}{dx^2} - 6\frac{dy}{dx} + 9y = e^{3x} \text{ is } \underline{\hspace{2cm}}$$

Options :

1. ✘ e^{3x}

2. ✘ $\frac{xe^{3x}}{2}$

3. ✘ xe^{3x}

4. ✓ $\frac{x^2 e^{3x}}{2}$

Question Number : 117 Question Id : 8318968757 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The value of the integral $\int_C \frac{6z-5}{z^2+4z+5} dz$, where C is the circle $|z| = 1$,
is _____

Options :

1. ✓ 0

2. ✗ $2\pi i$

3. ✗ π

4. ✗ $\frac{i\pi}{2}$

Question Number : 118 Question Id : 8318968758 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If X is a continuous random variable with the probability density

$$\text{function } f(x) = \begin{cases} K(1 - x^3), & \text{if } 0 < x < 1 \\ 0, & \text{otherwise} \end{cases}$$

Then, the value of K is _____

Options :

1. ✘ $\frac{3}{4}$
2. ✔ $\frac{4}{3}$
3. ✘ $\frac{1}{3}$
4. ✘ 3

Question Number : 119 Question Id : 8318968759 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A machine produces 0, 1 or 2 defective items in a day with probabilities of $\frac{1}{4}, \frac{1}{2}, \frac{1}{4}$, respectively. Then, the standard deviation of the number of defective items produced by the machine in a day, is

Options :

1. ✘ $\frac{1}{2}$
2. ✔ $\frac{1}{\sqrt{2}}$
3. ✘ $\frac{1}{4}$
4. ✘ 1

Question Number : 120 Question Id : 8318968760 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The Newton-Raphson method is used to find the root of the equation $f(x) = e^{-x} - x$. If the initial guess for the root is 0, then the estimate of the root after first iteration is _____

Options :

1. ✘ 0.56
2. ✘ -0.50
3. ✔ 0.50
4. ✘ -0.56