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 :	Instrumentation Engineering 20th July 2022 Shift 1
Duration :	120
Total Marks :	120
Display Marks:	No
Share Answer Key With Delivery Engine :	Yes
Calculator :	None
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	No
Show Watermark on Console? :	Yes
Highlighter :	No
Auto Save on Console?	Yes
Change Font Color :	No
Change Background Color :	No
Change Theme :	No
Help Button :	No
Show Reports :	No
Show Progress Bar :	No
Is this Group for Examiner? :	No
Examiner permission :	Cant View
Show Progress Bar? :	No

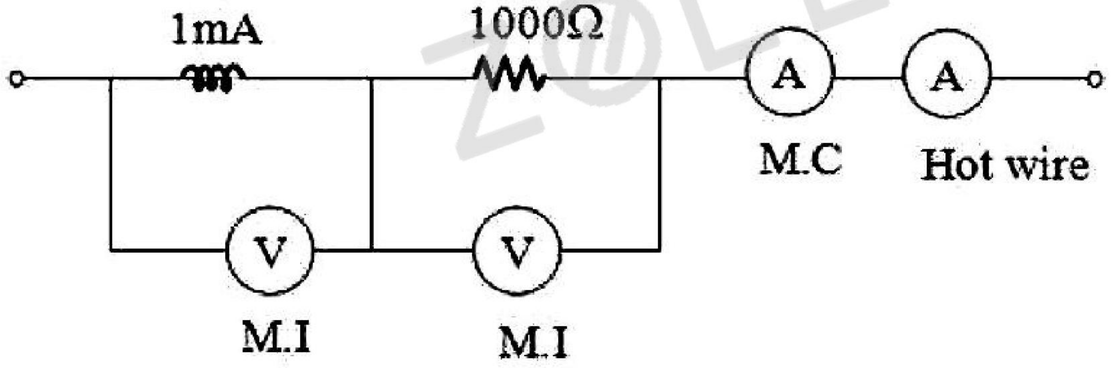
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Instrumentation Engineering

Section Id :	90030017
Section Number :	1
Mandatory or Optional :	Mandatory
Number of Questions :	120
Section Marks :	120
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0

Question Number : 1 Question Id : 9003001921 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A current $0.5 + 0.4 \sin wt + 0.2 \sin wt$ is passing through the circuit shown in below fig. The reading of the M.C instrument is _____amps.



Options :

1. ✖ 1

2. ✖ 1.5

3. ✔ 0.5

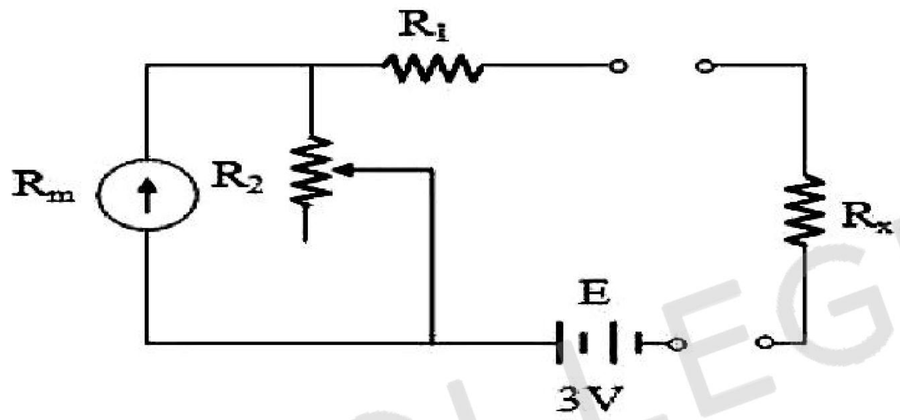
4. ✖ 2.5

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Question Number : 2 Question Id : 9003001922 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a series type ohm-meter as shown in fig. the meter has a 50 ohm basic movement and full scale current of 1 mA .

The total resistance of the ohm meter Circuit is 2000Ω and the battery is 3 V. find potential driver resistance?



Options :

1. ✗ 25 Ω

2. ✓ 100 Ω

3. ✗ 50 Ω

4. ✗ 75 Ω

Question Number : 3 Question Id : 9003001923 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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The following readings are obtained, when the meter reads an actual current of 2 A. The % error range?

1	2	3	4	5	6
1.96	2.02	1.98	1.99	2.04	2.01

Options :

1. ✔ ±2%

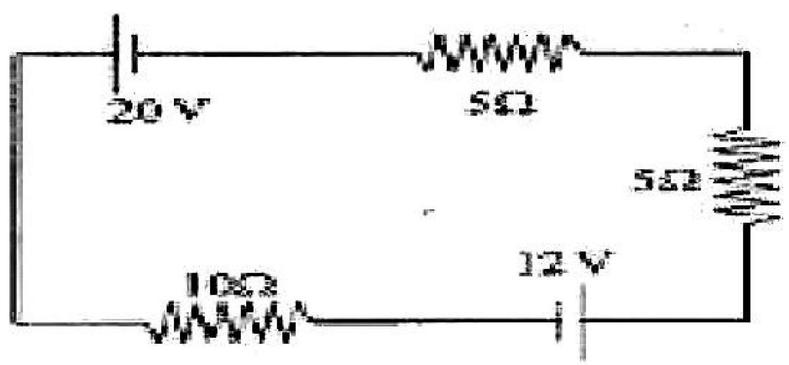
2. ✘ ±4%

3. ✘ ±1%

4. ✘ ±2.5%

Question Number : 4 Question Id : 9003001924 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Determine the electric current that flows in the circuit as shown in the figure below.



Options :

1. ✘ 1.6A

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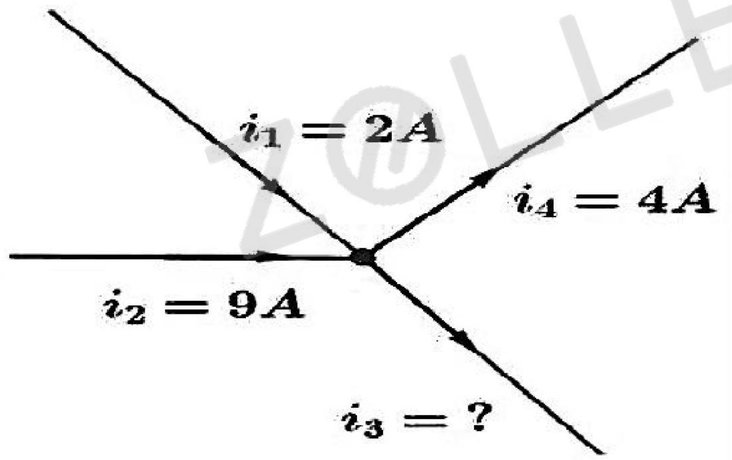
2. ✓ -1.6A

3. ✗ -2.1A

4. ✗ 2.1A

Question Number : 5 Question Id : 9003001925 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Find current i3 at the node shown below.



Options :

1. ✗ 10A

2. ✗ 3A

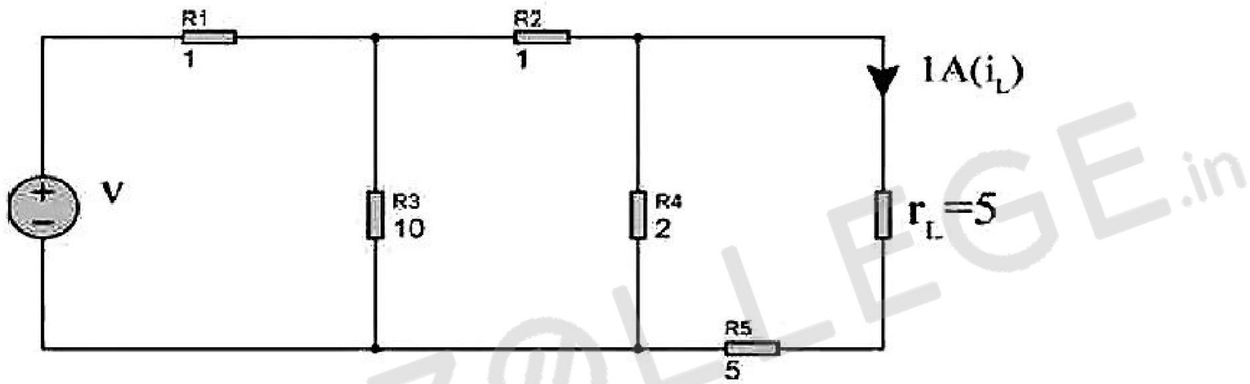
3. ✓ 7A

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4. ✖ 3.5A

Question Number : 6 Question Id : 9003001926 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Find the value of voltage source V using KVL and KCL from the given figure, all resistances are in ohms.



Options :

1. ✖ 52.6V

2. ✔ 61.6V

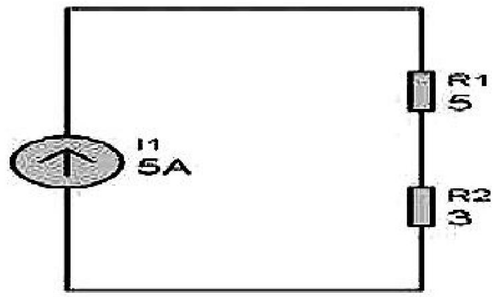
3. ✖ 41.3V

4. ✖ 56.8V

Question Number : 7 Question Id : 9003001927 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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Obtain voltages across resistor R_1 is [V1], R_2 is [V2] and current source is [Vs] in the given circuit:



Options :

1. ✔ $V_1:V_2:V_S = 25:15:40$

2. ✘ $V_1:V_2:V_S = 25:20:35$

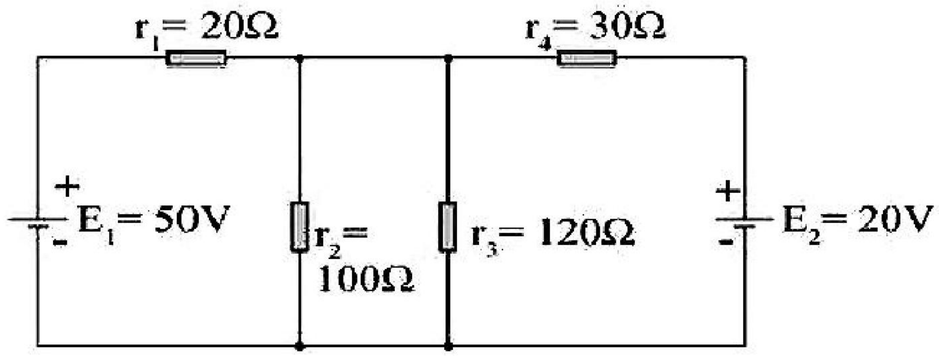
3. ✘ $V_1:V_2:V_S = 20:15:45$

4. ✘ $V_1:V_2:V_S = 25:10:40$

Question Number : 8 Question Id : 9003001928 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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Using Nodal method, find the current through resistor r_2



Options :

1. ✖ 121.8mA

2. ✖ 102.6mA

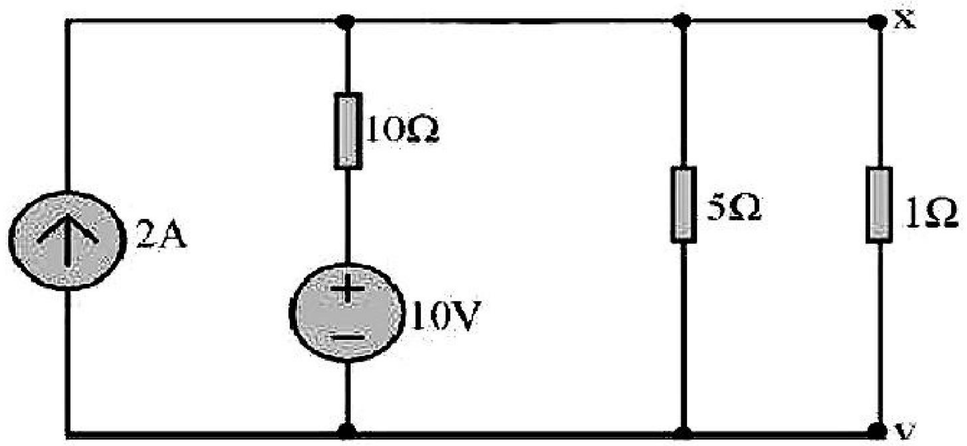
3. ✖ 510.2mA

4. ✔ 311.8mA

Question Number : 9 Question Id : 9003001929 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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In the circuit of figure, find the power loss in the 1Ω resistor by Thevenin's Theorem.



Options :

1. ✖ 2.25W

2. ✖ 3.61W

3. ✔ 5.33W

4. ✖ 4.61W

Question Number : 10 Question Id : 9003001930 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Potentiometer transducers are used for the measurement of

Options :

1. ✖ Pressure

2. ✖ Displacement

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3. ✖ Humidity

4. ✔ Both Pressure and Displacement

Question Number : 11 Question Id : 9003001931 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Strain gauge is a

Options :

1. ✖ Active device and converts mechanical displacement into a change of resistance

2. ✖ Passive device and converts electrical displacement into a change of resistance

3. ✔ Passive device and converts mechanical displacement into a change of resistance

4. ✖ Active device and converts electrical displacement into a change of resistance

Question Number : 12 Question Id : 9003001932 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is used for measuring leakage resistance of a capacitor?

Options :

1. ✖ Megger

2. ✔ Schering bridge

3. ✖ Potentiometer

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4. ✖ Loss of charge method

Question Number : 13 Question Id : 9003001933 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is the formula for pH calculation?

Options :

1. ✖ log10[H+]

2. ✔ -log10[H+]

3. ✖ log2[H+]

4. ✖ -log2[H+]

Question Number : 14 Question Id : 9003001934 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is the value of hydrogen ion concentration of pure water?

Options :

1. ✔ 1×10^{7} moles/litre

2. ✖ 1×10^{5} moles/litre

3. ✖ 1×10^{6} moles/litre

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4. ✖ 1×10^{8} moles/litre

Question Number : 15 Question Id : 9003001935 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An A.C signal conditioning system is normally used for

Options :

1. ✖ Resistive transducer like strain gauges

2. ✔ Inductive and capacitive transducer

3. ✖ Piezoelectric transducer

4. ✖ Voltage transducer

Question Number : 16 Question Id : 9003001936 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The transducer employed for measurement of angular displacement

Options :

1. ✖ LVDT

2. ✖ Thermocouple

3. ✖ Thermistor

4. ✔ Circular potentiometer

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Question Number : 17 Question Id : 9003001937 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A digital linear displacement transducer normally uses

Options :

1. ✖ Straight binary code

2. ✖ Binary code decimal

3. ✔ Gray code

4. ✖ Hexa decimal code

Question Number : 18 Question Id : 9003001938 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which instrument is used to measure a medium pressure?

Options :

1. ✔ Bourdon tube pressure gauges

2. ✖ Barometric sensor

3. ✖ piezoelectric pressure sensor

4. ✖ piezoresistive pressure sensor

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Question Number : 19 Question Id : 9003001939 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

_____ measures dynamic pressure

Options :

1. ✗ Bourdon tube pressure gauges

2. ✗ Barometric sensor

3. ✓ piezoelectric pressure sensor

4. ✗ piezoresistive pressure sensor

Question Number : 20 Question Id : 9003001940 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The manometric fluid density should be _____ than of flowing fluid

Options :

1. ✓ Greater

2. ✗ Smaller

3. ✗ Equal

4. ✗ Very small

Question Number : 21 Question Id : 9003001941 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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Two racing cars of masses m_1 and m_2 are moving in circles of radii r_1 and r_2 respectively. Their speeds are such that each makes a complete circle in the same time t. The ratio of the angular speeds of the first two to the second car will be _

Options :

1. ✓ 1:1

2. ✗ $r_1:r_2$

3. ✗ $m_1:m_2$

4. ✗ $m_1 m_2:r_1 r_2$

Question Number : 22 Question Id : 9003001942 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A germanium diode has a saturation current of 10^{-8} A. Calculate the junction current for a forward bias of 0.4V and 300K

Options :

1. ✗ 43mA

2. ✗ 46mA

3. ✓ 48mA

4. ✗ 50mA

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Question Number : 23 Question Id : 9003001943 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The specific gravity of Tungsten is 18.8 gm/cm^2 and its atomic weight is 184. If each atom is having TWO free electrons. Calculate n (electron concentration)

Options :

1. ✗ 1.32×10^{23} e$^-$/cm^3

2. ✓ 1.23×10^{23} e$^-$/cm^3

3. ✗ 1.32×10^{-23} e$^-$/cm^3

4. ✗ 1.23×10^{-23} e$^-$/cm^3

Question Number : 24 Question Id : 9003001944 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The transition capacitance of a step graded Si p-n junction diode is 20pF at a reverse bias voltage of 5V, and V_0=0.7V .If reverse bias voltage is increased by 1V, find the change in the capacitance

Options :

1. ✓ 1.55pF

2. ✗ 1.45pF

3. ✗ 1.50pF

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4. ✖ 1.47pF

Question Number : 25 Question Id : 9003001945 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In certain transistor, emitter current is 1.02 times as large as that of collector current. If the emitter current is 12mA. Find its base current

Options :

1. ✖ 0.45mA

2. ✖ 1.231mA

3. ✔ 0.235mA

4. ✖ 1.42mA

Question Number : 26 Question Id : 9003001946 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The pinch-off voltage for a n-channel JFET is 4V.When V_{GS}=1V, the pinch-off occurs for V_{DS} equals to

Options :

1. ✖ 2V

2. ✔ 3V

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3. ✖ 1V

4. ✖ 5V

Question Number : 27 Question Id : 9003001947 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The threshold voltage of an n-channel enhancement mode MOSFET is 0.5V. When the device is biased at a gate voltage of 3V. Pinch-off would occur at a drain voltage of

Options :

1. ✔ 2.5V

2. ✖ 1.5V

3. ✖ 1V

4. ✖ 3V

Question Number : 28 Question Id : 9003001948 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a bridge rectifier circuit the peak value of secondary voltage is $240\sqrt{2}$ v and frequency is 50Hz. Determine output frequency

Options :

1. ✖ 470Hz

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2. ✖ 110Hz

3. ✔ 100Hz

4. ✖ 320Hz

Question Number : 29 Question Id : 9003001949 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Determine the voltage gain for the closed-loop non –inverting amplifier circuit, with

$R_1 = 100\Omega$ and $R_f = 100k\,\Omega$

Options :

1. ✔ 1001

2. ✖ 1901

3. ✖ 1520

4. ✖ 2102

Question Number : 30 Question Id : 9003001950 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The input to an op-amp differentiator circuit is a sinusoidal voltage of peak value of

$10\mu V$ and frequency 2kHz. Determine the output voltage if R=50k Ω and C= 2μF

Options :

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1. ✗ $10.56\cos 4000\pi t$ mV

2. ✗ $9.56\cos 4000\pi t$ mV

3. ✓ $12.56\cos 4000\pi t$ mV

4. ✗ $11.56\cos 4000\pi t$ mV

Question Number : 31 Question Id : 9003001951 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An amplifier has a mid-frequency gain in 100 and a bandwidth of 200kHz. What will be the new bandwidth and gain, If 5% negative feedback is introduced?

Options :

1. ✗ 13.41

2. ✗ 11.01

3. ✗ 18.17

4. ✓ 16.67

Question Number : 32 Question Id : 9003001952 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of these is incorrect, for a Wien Bridge oscillator?

Options :

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1. ✖ Low distortion

2. ✖ Good stability at the resonant frequency

3. ✔ Difficult to tune

4. ✖ Based on frequency selective form of a Wheatstone bridge

Question Number : 33 Question Id : 9003001953 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In memory-mapped scheme, the devices are viewed as

Options :

1. ✖ distinct I/O devices

2. ✔ memory locations

3. ✖ only input devices

4. ✖ only output devices

Question Number : 34 Question Id : 9003001954 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A band pass filter uses _____ circuit.

Options :

1. ✖ a high-pass

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2. ✗ a low-pass

3. ✓ a high-pass and a low-pass

4. ✗ neither a low-pass nor a high-pass

Question Number : 35 Question Id : 9003001955 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

By increasing number of stages of an amplifier then its lower cutoff frequency

Options :

1. ✓ increases

2. ✗ decreases

3. ✗ remains constant

4. ✗ gets doubled for each stage

Question Number : 36 Question Id : 9003001956 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What type of feedback present in oscillators?

Options :

1. ✓ Positive

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2. ✖ Negative

3. ✖ series

4. ✖ shunt

Question Number : 37 Question Id : 9003001957 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

How many outputs are required for the implementation of a subtractor?

Options :

1. ✖ 1

2. ✔ 2

3. ✖ 3

4. ✖ 4

Question Number : 38 Question Id : 9003001958 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a sequential circuit, the output at any time depends only on the input values at that time.

Options :

1. ✖ Past output values

2. ✖ Intermediate values

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3. ✓ Both past output and present input

4. ✗ Present input values

Question Number : 39 Question Id : 9003001959 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A logic circuit that provides a HIGH output for both inputs HIGH or both inputs LOW is _____

Options :

1. ✓ Ex-NOR gate

2. ✗ OR gate

3. ✗ Ex-OR gate

4. ✗ NAND gate

Question Number : 40 Question Id : 9003001960 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The output of a subtractor is given by (if A, B and X are the inputs).

Options :

1. ✗ A AND B XOR X

2. ✓ A XOR B XOR X

3. ✗ A OR B NOR X

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4. ✖ A NOR B XOR X

Question Number : 41 Question Id : 9003001961 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In an 8085 microprocessor, which one of the following instructions changes the content of the accumulator?

Options :

1. ✖ MOV B,M

2. ✖ PCHL

3. ✖ RNZ

4. ✔ SBI REH

Question Number : 42 Question Id : 9003001962 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An instruction used to set the carry flag in a computer can be classified as

Options :

1. ✖ Data transfer control

2. ✖ Arithmetic control

3. ✔ Logical control

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4. ✖ Program control

Question Number : 43 Question Id : 9003001963 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The following five instructions were executed on an 8085 microprocessor.

MVI A, 33H

MVI B, 78H

ADD B

CMA

ANI 32H

Then the Accumulator value immediately after the execution of the fifth instruction is

Options :

1. ✖ 00H

2. ✔ 10H

3. ✖ 11H

4. ✖ 32H

Question Number : 44 Question Id : 9003001964 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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An 8085 assembly language program is given below. Assume that the carry flag is initially unset.

```
MVI A,07H
RLC
MOV B,A
RLC
RLC
ADD B
RRC
```

The content of the accumulator after the execution of the program is

Options :

1. ✖ 8CH

2. ✖ 64H

3. ✔ 23H

4. ✖ 15H

Question Number : 45 Question Id : 9003001965 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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For the 8085 assembly language program given below,

3000 MVI A, 45H

3002 MOV B, A

3003 STC

3004 CMC

3005 RAR

3006 XRA B

the content of the accumulator after the executions of the program is

Options :

1. ✖ 00H

2. ✖ 45H

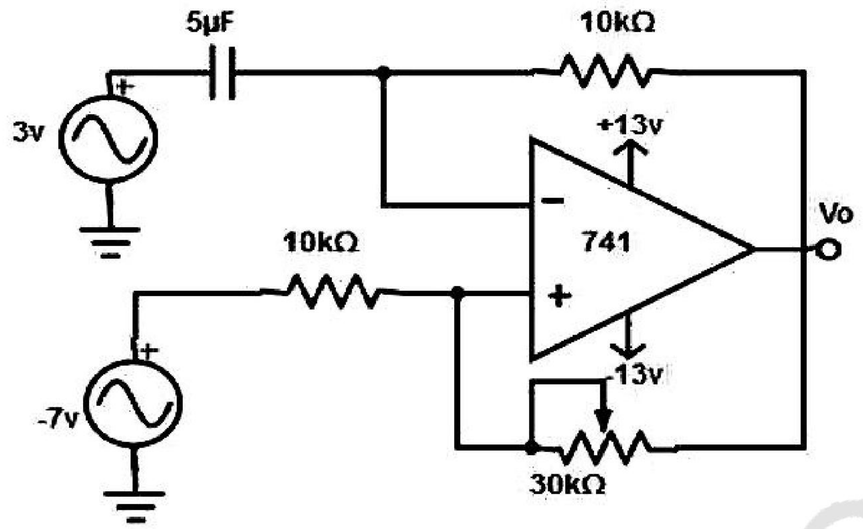
3. ✔ 67H

4. ✖ E7H

Question Number : 46 Question Id : 9003001966 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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The following circuit represents a square wave generator. Determine its output voltage



Options :

1. ✓ -13 v

2. ✗ +13 v

3. ✗ ± 13 v

4. ✗ -12.5v

Question Number : 47 Question Id : 9003001967 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An integrator type DVM contains a 1MΩ and 0.1μF capacitor. How much input voltage is to be applied to the integrator so that output voltage of the integrator is 1V after 1 sec?

Options :

1. ✗ 20 V

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2. ✖ 10 V

3. ✔ 0.1 V

4. ✖ 1 V

Question Number : 48 Question Id : 9003001968 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The number of bits in a binary PCM system is increased from n to n + 1. As a result, signal to quantization noise ratio will improve by a factor

Options :

1. ✖ (n + 1)/n

2. ✖ $2(n+1)^2$

3. ✖ 2(n+1)

4. ✔ which is independent of n

Question Number : 49 Question Id : 9003001969 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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Four independent messages have bandwidths of 100Hz, 100Hz, 200Hz, and 400Hz, respectively. Each is sampled at the Nyquist rate, and the samples are Time Division Multiplexed (TDM) and transmitted. The transmitted sample rate (in Hz) is

Options :

1. ✓ 1600

2. ✗ 800

3. ✗ 400

4. ✗ 200

Question Number : 50 Question Id : 9003001970 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a bit-rate of 8 Kbps, the best possible values of the transmitted frequencies in a coherent binary FSK system are

Options :

1. ✗ 16 kHz and 20 kHz

2. ✗ 20 kHz and 32 kHz

3. ✗ 20 kHz and 40 kHz

4. ✓ 32 kHz and 40 kHz

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Question Number : 51 Question Id : 9003001971 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a PCM system with uniform quantization, increasing the number of bits from 8 to 9

will reduce the quantization noise power by a factor of

Options :

1. ✖ 9

2. ✖ 8

3. ✔ 4

4. ✖ 2

Question Number : 52 Question Id : 9003001972 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A five-point sequence x[n] is given as x [–3] = 1, x [-2] = 1, x [-1] =0, x [0] = 5,

x [1] = 1. Let X (e^{jw}) denote the discrete-time Fourier transform of x[n].

The value of $\int_{-\pi}^{\pi} X(e^{jw})\, dw$ is

Options :

1. ✖ 5

2. ✔ 10

3. ✖ 16

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4. ✖ $5+\varphi 10\pi$

Question Number : 53 Question Id : 9003001973 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The first six points of the 8-point DFT of a real valued sequence are 5, 1 -j3, 0, 3 –j4, and 3 + j4. The last two points of the DFT are respectively.

Options :

1. ✖ 0, 1-*j*3

2. ✔ 0, 1 + 3j

3. ✖ 1+*j*3, 5

4. ✖ 1-*j*3, 5

Question Number : 54 Question Id : 9003001974 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If *G(f)* represents the Fourier transform of a Signal *g(t)*, which is real and odd symmetric in time, then

Options :

1. ✖ *G(S)* is complex

2. ✔ *G(f)* is imaginary

3. ✖ *G(S)* is real

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4. ✗ G(*f*) is real and non-negative

Question Number : 55 Question Id : 9003001975 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A half-wave rectified sinusoidal waveform has a peak voltage of 10V. Its average value and the peak value of the fundamental component are, respectively, given by

Options :

1. ✗ $\frac{20}{2\pi}$ V, $\frac{10}{\sqrt{2}}$ V

2. ✗ $\frac{10}{\pi}$V, $\frac{10}{\sqrt{2}}$ V

3. ✓ $\frac{10}{\pi}$ V, 5v

4. ✗ $\frac{20}{\pi}$ V, 5V

Question Number : 56 Question Id : 9003001976 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let $x(t) \leftrightarrow x(jw)$ be Fourier transform pair. The Fourier transform of signal $x(5t-3)$ in terms of $x(jw)$ is given as

Options :

1. ✓ $\frac{1}{5}e^{(j3w/5)}x(\frac{Jw}{5})$

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2. ✖ $\frac{1}{5}e^{(-j3w/5)}X(\frac{Jw}{5})$

3. ✖ $-\frac{1}{5}e^{(j3w)}X(\frac{Jw}{5})$

4. ✖ $\frac{1}{5}e^{(j3w)}X(\frac{Jw}{5})$

Question Number : 57 Question Id : 9003001977 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let $g(t) = e^{(-\pi t)^2}$ and h(t) is filter matched to g(t). If g(t) is applied as input to h(t), then the Fourier transform of the output is

Options :

1. ✖ $e^{(-\pi t)^2}$

2. ✖ $e^{(-\pi t)^2/2}$

3. ✖ $e^{-\pi|f|}$

4. ✔ $e^{(-2\pi f)^2}$

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Question Number : 58 Question Id : 9003001978 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

CAT scan is essentially

Options :

1. ✖ a finer X-ray of bones

2. ✖ a detailed x-ray

3. ✔ x-ray of soft tissues

4. ✖ x-ray of brain

Question Number : 59 Question Id : 9003001979 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What will happen if we supply a voltage of 250 kv to the terminal of the LDR sensor?

Options :

1. ✔ Damage is caused

2. ✖ Module will shut down

3. ✖ Module will not respond for the time the voltage is applied

4. ✖ Module will function normally

Question Number : 60 Question Id : 9003001980 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response

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Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the use of the LDR sensors?

Options :

1. ✗ Monitors motion

2. ✗ Monitors air pressure

3. ✓ Monitors Light intensity

4. ✗ Monitors heartbeat

Question Number : 61 Question Id : 9003001981 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The following is not a material for Laser source in fiber optics

Options :

1. ✗ Nd-YAG

2. ✗ He-Ne

3. ✗ Argon

4. ✓ Phosphorous

Question Number : 62 Question Id : 9003001982 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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Which of the following can be used for the generation of laser pulse?

Options :

1. ✗ Ruby laser

2. ✗ CO_2 laser

3. ✗ He-Ne laser

4. ✓ Nd-Yag laser

Question Number : 63 Question Id : 9003001983 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✗ surface electrodes

2. ✓ needle electrodes

3. ✗ pregelled electrodes

4. ✗ scalp electrodes

Question Number : 64 Question Id : 9003001984 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is a wireless ECG acquiring system?

Options :

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1. ✗ pregelled disposable electrodes

2. ✗ Limb electrodes

3. ✗ Pasteless electrodes

4. ✓ Smart pad

Question Number : 65 Question Id : 9003001985 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum voltage that can be measured by three and half digit digital voltmeter in

0- 100 V range of operation is

Options :

1. ✗ 100.0V

2. ✗ 99.99V

3. ✓ 199.9V

4. ✗ 200.0V

Question Number : 66 Question Id : 9003001986 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The wavelength of X-rays is

Options :

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1. ✗ 1mm to 700nm

2. ✗ 400nm to 1nm

3. ✓ 1nm to 0.001nm

4. ✗ 0.1nm to 1nm

Question Number : 67 Question Id : 9003001987 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

X-rays crystallography uses which characteristics of light?

Options :

1. ✗ Polarization

2. ✗ Interference

3. ✓ Diffraction

4. ✗ Coherency

Question Number : 68 Question Id : 9003001988 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What does the T-wave represent in an ECG?

Options :

1. ✗ Atrial disable

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2. ✖ Atrial systole

3. ✔ Ventricular diastole

4. ✖ Joint diastole

Question Number : 69 Question Id : 9003001989 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A particular green LED emits light of wavelength 54 90 A° .The energy band gap of the semiconductor material used there is _____. (Planck's constant = 6.626×10^{-34} J-s)

Options :

1. ✔ 2.26 ev

2. ✖ 1.98ev

3. ✖ 1.17ev

4. ✖ 0.74ev

Question Number : 70 Question Id : 9003001990 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Heavy metals can be analyzed by

Options :

1. ✖ Gas chromatography

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2. ✖ HPLC

3. ✖ PH meter

4. ✔ Atomic absorption spectroscopy

Question Number : 71 Question Id : 9003001991 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Who developed an Electrocardiogram (or) ECG?

Options :

1. ✖ Wilhelm His

2. ✖ Steward

3. ✖ Hubert Mann

4. ✔ Willem Einthoven

Question Number : 72 Question Id : 9003001992 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Negative feedback in a closed loop control system does not

Options :

1. ✖ reduce the overall gain

2. ✔ reduce bandwidth

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3. ✖ improve disturbance rejection

4. ✖ reduce sensitivity to parameter variation

Question Number : 73 Question Id : 9003001993 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A ramp input applied to a unity feedback system result in a 5% steady state error. The type number and zero frequency gain of the system are, respectively

Options :

1. ✔ 1 and 20

2. ✖ 0 and 20

3. ✖ 0 and 1/20

4. ✖ 1 and 1/20

Question Number : 74 Question Id : 9003001994 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The open loop transfer function of a unity gain feedback control system given by G(s)= K/ (S+1) (S+2). The gain margin of the system in dB is given by

Options :

1. ✖ 0

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2. ✖ 1

3. ✖ 20

4. ✔ ∞ (Infinity)

Question Number : 75 Question Id : 9003001995 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a digital voltmeter, input signal is integrated for duration of 300 clock cycles. To eliminate the effect of 60 Hz noise present in the signal, what is the maximum clock frequency?

Options :

1. ✖ 81Khz

2. ✔ 18Khz

3. ✖ 80Khz

4. ✖ 20Khz

Question Number : 76 Question Id : 9003001996 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Two ammeter are joined in sries circuit carrying 10 A one. Ammeter has a resistance of 1000Ω shunted by 0.05Ω while other ammeter has resistance of 1500Ω shunted by 0.02. If the shunts are interchanged, what will be readings of ammeters?

Options :

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1. ✖ 25 A, 4 A

2. ✔ 4 A, 25 A

3. ✖ 3 A, 22 A

4. ✖ 22 A, 3 A

Question Number : 77 Question Id : 9003001997 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A 50 V M.I voltmeter has a resistance of 400Ω made up of a copper coil of 40Ω and 80mH in series with a non-inductive resistance of 360Ω. The value of the capacitor connected to the instrument, so that instrument will read correctly on DC and AC is __ μF.

Options :

1. ✔ 0.25

2. ✖ 0.5

3. ✖ 0.6

4. ✖ 2.5

Question Number : 78 Question Id : 9003001998 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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A 0-1 Ampere moving iron ammeter has an internal resistance of 50 mΩ and inductance of 0.1mH. A shunt coil is connected to extend its range to 0-10 Ampere for all operating frequencies. The time constant in milliseconds and resistance in mΩ of the shunt coil respectively are

Options :

1. ✔ 2, 5.55

2. ✖ 2,1

3. ✖ 2.18,0.55

4. ✖ 11.1,2

Question Number : 79 Question Id : 9003001999 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Two wattmeter method is used for measurement of power in a balanced three-phase load supplied from a balanced three-phase system. If one of the watt meters reads half of the other (both positive), then the power factor of the load is

Options :

1. ✖ 0.532

2. ✖ 0.632

3. ✖ 0.707

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4. ✓ 0.866

Question Number : 80 Question Id : 9003002000 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Power consumed by a balanced 3-phase, 3-wire load is measured by the two wattmeter method. The first wattmeter reads twice that of the second. Then the load impedance angle in radians is

Options :

1. ✗ $\pi/2$

2. ✗ $\pi/5$

3. ✓ $\pi/6$

4. ✗ $\pi/4$

Question Number : 81 Question Id : 9003002001 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An energy meter connected to an immersion heater (resistive) operating on an AC 230V, 50 Hz, AC single) phase source reads 2.3 units (kWh) in 1 hour. The heater is removed from the supply and now connected to a 4000 V peak to peak square wave source of 150 Hz. The power in kW dissipated by the heater will be

Options :

1. ✗ 3.478

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2. ✔ 1.739

3. ✖ 1.540

4. ✖ 0.870

Question Number : 82 Question Id : 9003002002 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Two 8 ADC s one of single slope integrating type and other of successive approximation type. Take TA and TB times to connect 5V analog input signal to equivalent digital output. If the input analog signal is reduced to 2.5V the approximate time taken by the two ADC's will respectively be

Options :

1. ✔ TA, TB

2. ✖ TA/2, TB

3. ✖ TA, TB/2

4. ✖ TA/2, TB/2

Question Number : 83 Question Id : 9003002003 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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A 4.5 digit DMM has the error specification as 0.2% of reading +10 counts. If a dc voltage of 100 v is read on its 200 V full scale. The maximum error that can be expressed in the reading is

Options :

1. ✖ $\pm 0.1\%$

2. ✖ $\pm 0.2\%$

3. ✔ $\pm 0.3\%$

4. ✖ $\pm 0.4\%$

Question Number : 84 Question Id : 9003002004 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An energy meter is designed to make 100 resolutions made by it when connected to a load carrying a current of 20A at 230V and 0.8p.f for an hour is

Options :

1. ✖ 369

2. ✔ 368

3. ✖ 367

4. ✖ 370

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Question Number : 85 Question Id : 9003002005 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A 50 Hz, bar primary CT has a secondary with 500 turns. The secondary supplies 5 A current into a purely resistive burden of 1Ω . The magnetizing ampere-turns is 200. The phase angle between the primary and secondary current is

Options :

1. ✓ 4.6^{o}

2. ✗ 85.4^{o}

3. ✗ 94.6^{o}

4. ✗ 175.4^{o}

Question Number : 86 Question Id : 9003002006 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The slope and level detector circuit in a CRO has a delay of 100 ns. The start-stop sweep generator has a response time of 50 ns. In order to display correctly, a delay line of

Options :

1. ✓ 150 ns has to be inserted into the y-channel

2. ✗ 150 ns has to be inserted into the x-channel

3. ✗ 150 ns has to be inserted into both x and y channels

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4. ✗ 100 ns has to be inserted into both x and y channels

Question Number : 87 Question Id : 9003002007 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A stationary closed Lissajous pattern on an oscilloscope has 3 horizontal tangencies and 2 vertical tangencies for a horizontal input with frequency 3 kHZ. The frequency of the vertical input is

Options :

1. ✗ 1.5 kHz

2. ✗ 2 kHz

3. ✗ 3kHz

4. ✓ 4.5 kHz

Question Number : 88 Question Id : 9003002008 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A CRO screen has ten divisions on the horizontal scale. If a voltage signal $5\sin(314t+45°)$ is examined with a line base setting of 5 msec/div, the number of cycles of signal displayed on the screen will be

Options :

1. ✗ 0.5 cycles

2. ✓ 2.5 cycles

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3. ✖ 5 cycles

4. ✖ 10 cycles

Question Number : 89 Question Id : 9003002009 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The oscilloscope has input resistance of 1MΩ and capacitance of 5pF and the voltage divider ratio (K) is 10. What are the parameters of high input impedance probe?

Options :

1. ✖ 0.55pF, 18 MΩ

2. ✔ 0.55pF, 9 MΩ

3. ✖ 66pF, 20 MΩ

4. ✖ 0.5 pF, 9 MΩ

Question Number : 90 Question Id : 9003002010 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 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

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3. ✖ EEG

4. ✖ EKG

Question Number : 91 Question Id : 9003002011 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Normal EEG frequency range is _____

Options :

1. ✖ 50-500Hz

2. ✔ 0.5-50HZ

3. ✖ 0.05-5Hz

4. ✖ 1-200Hz

Question Number : 92 Question Id : 9003002012 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Recording electrical activities associated with heart is known as _____

Options :

1. ✖ EEG

2. ✖ EOG

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3. ✗ EMG

4. ✓ ECG

Question Number : 93 Question Id : 9003002013 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

ECG identified by the PR interval tends to become longer with every succeeding ECG complex until there is a P wave not followed by a QRS is observed in

Options :

1. ✗ Third-Degree Atrioventricular Block

2. ✗ Second-Degree Atrioventricular Block, Type II

3. ✓ Second-Degree Atrioventricular Block, Type I

4. ✗ First-Degree Atrioventricular Block, Type II

Question Number : 94 Question Id : 9003002014 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Fiber optic system has three basic components, in the order. They are:

Options :

1. ✗ light guide, light source, light detector

2. ✓ light source, light guide, light detector

3. ✗ light detector, light source, light guide

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4. ✗ light guide, light detector, light source

Question Number : 95 Question Id : 9003002015 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following statements is true in case of an LED?

Options :

1. ✓ It is an incoherent optical source that emits light over a relatively wider angle with a broad spectrum.

2. ✗ It is a highly coherent optical source that emits light over a relatively wider angle with a broad spectrum.

3. ✗ It is an incoherent optical source and emits radiation in a narrow range of angles and contains a narrow spectrum of wavelengths.

4. ✗ It is a highly coherent optical source and emits radiation in a narrow range of angles and contains a narrow spectrum of wavelengths.

Question Number : 96 Question Id : 9003002016 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Step-index fiber has specified parameters for refractive index of fiber core and cladding as 1.50 and 1.33, respectively. Its acceptance angle will be approximately

Options :

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1. ✗ 25°

2. ✗ 20°

3. ✓ 15°

4. ✗ 10°

Question Number : 97 Question Id : 9003002017 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The light is propagated within the fiber core by the phenomenon

Options :

1. ✓ total internal reflection at core-cladding intersection

2. ✗ refraction at core-cladding intersection

3. ✗ total internal reflection at the outer surface of the cladding

4. ✗ change in the velocity of light within the fiber core

Question Number : 98 Question Id : 9003002018 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The representation of Beer Lambert's law is given as A = abc. If 'b' represents distance, 'c' represents concentration and 'A' represents absorption, what does 'a' represent?

Options :

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1. ✗ Intensity

2. ✗ Transmittance

3. ✓ Absorptivity

4. ✗ Admittance

Question Number : 99 Question Id : 9003002019 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following components are used to generate X-rays?

Options :

1. ✗ Meyer tube

2. ✗ West tube

3. ✗ Anger tube

4. ✓ Coolidge tube

Question Number : 100 Question Id : 9003002020 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When x-rays emitted from molybdenum are allowed to pass through a zirconium filter, which of the following occurs?

Options :

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1. ✗ It absorbs radiation of shorter wavelength

2. ✓ It absorbs radiation of longer wavelength

3. ✗ It allows radiation of shorter wavelength to pass through

4. ✗ It allows radiation in a particular band to pass through

Question Number : 101 Question Id : 9003002021 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following produce EM radiation in IR region

Options :

1. ✗ Body with negative temperature

2. ✗ Body with temperature less than 1000C

3. ✓ Body with temperature less than 6000C

4. ✗ Body with temperature less than 10000C

Question Number : 102 Question Id : 9003002022 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The correct biasing conditions for typical operation of light emitting diode, photo diode and Zener diode are respectively

Options :

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1. ✓ Forward bias, reverse bias, reverse bias

2. ✗ Reverse bias, reverse bias, Forward bias

3. ✗ Forward bias, Forward bias, reverse bias

4. ✗ Reverse bias, forward bias, reverse bias

Question Number : 103 Question Id : 9003002023 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A ray of light enters a glass optical fiber (refractive index 1.45) surrounded by air.

Calculate the angle of incidence greater than which causes total internal reflection.

Options :

1. ✗ 540

2. ✓ 43.60

3. ✗ 630

4. ✗ 64.60

Question Number : 104 Question Id : 9003002024 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is not preferred for electrode making?

Options :

1. ✗ Ag-AgCl

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2. ✖ Copper

3. ✔ Stainless-steel

4. ✖ gold

Question Number : 105 Question Id : 9003002025 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An optical pulse containing 6×10^6 photons is incident on a photodiode and 4.5×10^6 electron-hole pairs are created. The maximum possible quantum efficiency (in %) of photodiode is _____

Options :

1. ✖ 60%

2. ✔ 75%

3. ✖ 80%

4. ✖ 95%

Question Number : 106 Question Id : 9003002026 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is used as a photo detector in pulse oximetry?

Options :

1. ✖ Phototransistor

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2. ✗ Solar cell

3. ✓ Photo diode

4. ✗ Photographic plates

Question Number : 107 Question Id : 9003002027 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which transducer is arranged in the shape of clover leaf so that it provides a large area of illumination?

Options :

1. ✗ Piezo – electric

2. ✓ Ultrasonic

3. ✗ Array

4. ✗ Pressure

Question Number : 108 Question Id : 9003002028 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Collimated light beams from a He-Ne laser and a sodium vapor lamp (used for street lighting) are focused using a lens. The size of the spot at the focal point due to the laser is relatively smaller because

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Options :

1. ✗ Laser light is relatively more monochromatic

2. ✓ The limiting divergence of laser light is relatively smaller

3. ✗ The output power of the laser is relatively larger

4. ✗ The wavelength of the laser is relatively longer

Question Number : 109 Question Id : 9003002029 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 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 : 110 Question Id : 9003002030 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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Reference electrode for recording EEG is placed on _____

Options :

1. ✔ Forehead

2. ✖ Cervical

3. ✖ Nasal

4. ✖ Facial

Question Number : 111 Question Id : 9003002031 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For what values of a and b the equations $x+2y+3z = 6$, $x+3y+5z = 9$, $2x+5y+az = b$ have no solutions

Options :

1. ✖ $a \neq 8, b = 15$

2. ✖ $a \neq 8, b \neq 15$

3. ✖ $a = 8, b = 15$

4. ✔ $a = 8, b \neq 15$

Question Number : 112 Question Id : 9003002032 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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Eigen values of the matrix $\begin{bmatrix} 1 & 1 & -2 \\ -1 & 2 & 1 \\ 0 & 1 & -1 \end{bmatrix}$ are

Options :

1. ✖ 1, -2, 1

2. ✔ 1, 2, - 1

3. ✖ 0, 2, - 2

4. ✖ 1, -1, 0

Question Number : 113 Question Id : 9003002033 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If f (x, y) = xy + x - y, then the stationary points are

Options :

1. ✔ (1, -1)

2. ✖ (1, 1)

3. ✖ (1, 0)

4. ✖ (0, 1)

Question Number : 114 Question Id : 9003002034 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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Value of normal vector to the surface $z = x^2 + y^2$ at the point (-1, -2, 5)

Options :

1. ✔ $-2i - 4j - k$

2. ✘ $-2i + 4j + k$

3. ✘ $-2i + 4j - k$

4. ✘ $2i - 4j - k$

Question Number : 115 Question Id : 9003002035 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

General Solution of $\frac{d^2y}{dx^2} - 9y = 0$

Options :

1. ✘ $y = C_1 Cos3x + C_2 Sin3x$

2. ✘ $y = C_1 Cos3x - C_2 Sin3x$

3. ✔ $y = C_1 e^{3x} + C_2 e^{-3x}$

4. ✘ $y = C_1 e^{3x} - C_2 e^{-3x}$

Question Number : 116 Question Id : 9003002036 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

General Solution of $px + f(p, q) = z - qy$

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Options :

1. ✓ $z = ax + by + f(a, b)$

2. ✗ $z = ax - by + f(a, b)$

3. ✗ $z = ax^{-1} + by^{-1} + f(a, b)$

4. ✗ $z = ax^2 + by^2 + f(a, b)$

Question Number : 117 Question Id : 9003002037 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let $f(z) = \frac{1}{z-3}$, and C: $|z-2| = 5$. The value of $\int_c f(z)dz$ is

Options :

1. ✗ $4\pi i$

2. ✗ $-4\pi i$

3. ✓ $2\pi i$

4. ✗ $-2\pi i$

Question Number : 118 Question Id : 9003002038 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $f(z) = \frac{z}{(z+1)(z-2)}$, then the Residue at $z = -1$ is

Options :

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1. ✔ 1/3

2. ✖ 1/2

3. ✖ -1/2

4. ✖ -1/3

Question Number : 119 Question Id : 9003002039 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Probability of getting 3 heads in tossing 5 coins is

Options :

1. ✖ 1/16

2. ✖ 3/16

3. ✔ 5/16

4. ✖ 7/16

Question Number : 120 Question Id : 9003002040 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Newton Iteration formula is

Options :

1. ✖ $x_{n+1} = x_n + f(x_n)/ f^1(x_n)$

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2. ✓ $x_{n+1} = x_n - f(x_n)/ f^1(x_n)$

3. ✗ $x_n = x_{n-1} + f(x_n)/ f^1(x_n)$

4. ✗ $x_{n+1} = x_{n-1} + f(x_n)/ f^1(x_n)$

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