

Telangana State Council 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 :	Electrical Engineering 11th Aug 2021 Shift 2
Subject Name :	Electrical Engineering
Creation Date :	2021-08-11 16:42:20
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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

Electrical Engineering

Group Number :	1
Group Id :	12984022
Group Maximum Duration :	0
Group Minimum Duration :	120
Show Attended Group? :	No

Edit Attended Group? :	No
Break time :	0
Group Marks :	120
Is this Group for Examiner? :	No

Mathematics

Section Id :	12984038
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	10
Section Marks :	10
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Sub-Section Number :	1
Sub-Section Id :	12984038
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 1298402521 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

An Eigen value of the matrix $\begin{bmatrix} -1 & 2 & 3 \\ 2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$ is

Options :

1. ✘ 1

2. ✘ 2

3. ✖ 3

4. ✔ 4

Question Number : 2 Question Id : 1298402522 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider $f(x) = (x - 1)(x - 2)(x - 3)$, $x \in [0, 4]$. Then a value of c satisfying $f(4) - f(0) = 4f'(c)$ is

Options :

1. ✖ $2\sqrt{3}$

2. ✔ $\frac{2}{3}(3 - \sqrt{3})$

3. ✖ $\frac{2}{3}(3 - 2\sqrt{3})$

4. ✖ $\frac{2}{3}(3 + 2\sqrt{3})$

Question Number : 3 Question Id : 1298402523 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The directional derivative of $\phi = xyz^2 + yzx^2 + zxy^2$ at the point $(1, 1, -1)$ in the direction of the line $\frac{x}{1} = \frac{y}{+1} = \frac{z+1}{1}$ is

Options :

1. ✘ $\sqrt{2}$

2. ✘ $-3\sqrt{2}$

3. ✔ $-2\sqrt{2}$

4. ✘ $3\sqrt{2}$

Question Number : 4 Question Id : 1298402524 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The particular integral of $y'' - 2y' + y = xe^x$ is

Options :

1. ✘ $\frac{x^3}{12}e^x$

2. ✓ $\frac{x^3}{6}e^x$

3. ✗ $\frac{x^3}{3}e^x$

4. ✗ x^3e^x

Question Number : 5 Question Id : 1298402525 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Residue of Cosec^2z at $z = 2\pi$ is

Options :

1. ✗ $\frac{1}{3}$

2. ✗ $\frac{1}{2}$

3. ✓ 0

4. ✗ 1

Question Number : 6 Question Id : 1298402526 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If C is the positively oriented curve $2x^2 + y^2 = 2$, then $\int_C \frac{dz}{z^2 + 2z} =$

Options :

1. ✓ πi
2. ✗ $2\pi i$
3. ✗ $\frac{\pi i}{2}$
4. ✗ $\frac{\pi i}{4}$

Question Number : 7 Question Id : 1298402527 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Fourier sine transform of $e^{-|x|}$ is $F_s(e^{-|x|}) =$

Options :

1. ✘ $\frac{-1}{1+s^2}$

2. ✘ $\frac{-s}{1+s^2}$

3. ✘ $\frac{1}{1+s^2}$

4. ✔ $\frac{s}{1+s^2}$

Question Number : 8 Question Id : 1298402528 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Two numbers a, b are chosen at random from $\{1, 2, 4, \dots, 40\}$. The probability that a and b satisfy $7a = 3b$ is

Options :

1. ✘ $\frac{1}{312}$

2. ✘ $\frac{1}{78}$

3. ✔ $\frac{1}{780}$

4. ✘ $\frac{1}{390}$

Question Number : 9 Question Id : 1298402529 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If a number x is selected from natural numbers 1, 2, ..., 100, then probability for

$$x + \frac{100}{x} > 29 \text{ is}$$

Options :

1. ✘ $\frac{33}{50}$

2. ✘ $\frac{37}{50}$

3. ✓ $\frac{39}{50}$

4. ✗ $\frac{41}{50}$

Question Number : 10 Question Id : 1298402530 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $y_0 = 1$, $y_1 = 2.7$, $y_2 = 7.4$, $y_3 = 20.1$ and $y_4 = 54.7$, then the value of $\int_0^4 y dx$ by

Simpson's $\frac{1}{3}$ rule is

Options :

1. ✗ 53.5

2. ✗ 53.7

3. ✓ 53.9

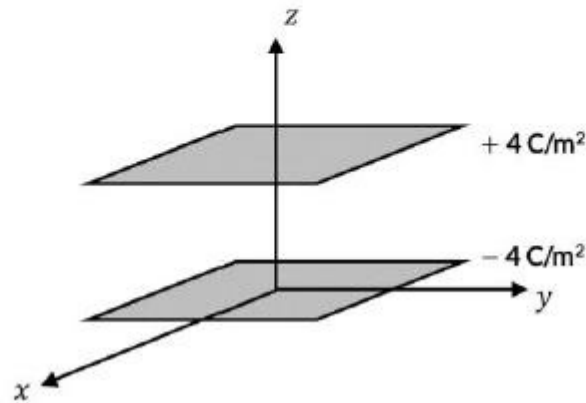
4. ✗ 54.1

Electrical Engineering

Section Id :	12984039
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	110
Number of Questions to be attempted :	110
Section Marks :	110
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Sub-Section Number :	1
Sub-Section Id :	12984039
Question Shuffling Allowed :	Yes

Question Number : 11 Question Id : 1298402531 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

An infinite air filled parallel plate capacitor is arranged such that the lower side of upper plate carries surface charge density 4 C/m^2 and upper side of lower plate carries surface charge density -4 C/m^2 as shown in below figure. The electric field intensity between the plates will be



Options :

1. ✓ $\frac{-4}{\epsilon_0} \hat{a}_z$

2. ✗ $\frac{4}{\epsilon_0} \hat{a}_z$

3. ✗ $\frac{-2}{\epsilon_0} \hat{a}_z$

4. ✗ $\frac{2}{\epsilon_0} \hat{a}_z$

Question Number : 12 Question Id : 1298402532 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A $40 \mu\text{C}$ point charge is located at the origin. The total electric flux passing through the hemispherical surface defined by $r = 24 \text{ m}$, $0 \leq \theta \leq \frac{\pi}{2}$ is

Options :

1. ✗ $40 \mu\text{C}$

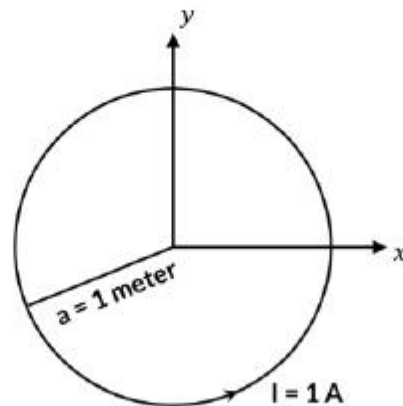
2. ✗ $10 \mu\text{C}$

3. ✓ $20 \mu\text{C}$

4. ✘ $80 \mu\text{C}$

Question Number : 13 Question Id : 1298402533 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A circular loop of radius 1 meter, centered at origin and lying in the xy plane, carries current of 1A as shown in the below figure.



The magnetic field intensity at the centre of the loop will be

Options :

1. ✔ $\frac{1}{2} \hat{a}_z \text{ A/m}$

2. ✘ $-\frac{1}{2} \hat{a}_z \text{ A/m}$

3. ✘ $\frac{1}{4} \hat{a}_z \text{ A/m}$

4. ✘ $2 \hat{a}_z \text{ A/m}$

Question Number : 14 Question Id : 1298402534 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Two parallel plate capacitors are having the areas, $A_1 = 4 \text{ m}^2$ and $A_2 = 16 \text{ m}^2$. The ratio of the capacitances C_2/C_1 is (assume the same dielectric material between the plates and also the distance between the plates is same in both the capacitors)

Options :

1. ✘ 2:1

2. ✔ 4:1

3. ✘ $\frac{1}{16}$

4. ✘ $\frac{1}{8}$

Question Number : 15 Question Id : 1298402535 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

What is the value of total electric flux coming out of a closed surface

Options :

1. ✘ Zero
2. ✘ Equal to volume charge density
3. ✔ Equal to total charge enclosed by the surface
4. ✘ Equal to surface charge density

Question Number : 16 Question Id : 1298402536 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Plane $z = 20$ meter carries surface charge density 40 nC/m^2 . What is the electric field at the origin?

Options :

1. ✘ $\frac{40}{\epsilon_0} \hat{a}_z \text{ nV/m}$

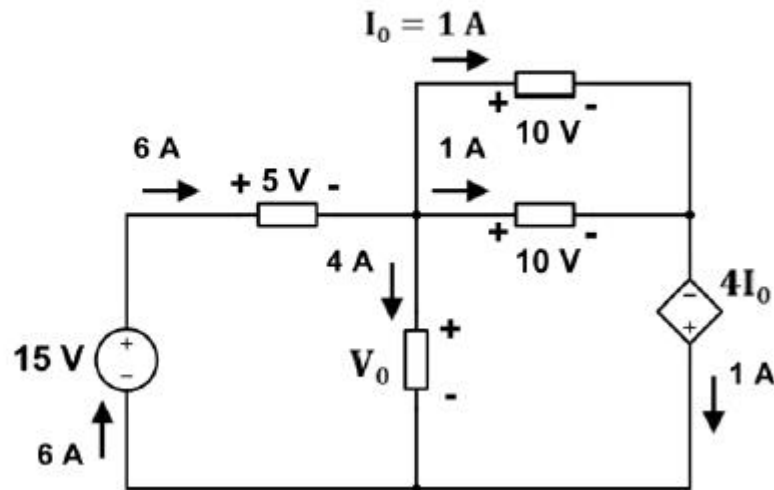
2. ✘ $\frac{-2}{\epsilon_0} \hat{a}_z \text{ nV/m}$

3. ✔ $\frac{-20}{\epsilon_0} \hat{a}_z \text{ nV/m}$

4. ✘ $\frac{20}{\epsilon_0} \hat{a}_z \text{ nV/m}$

Question Number : 17 Question Id : 1298402537 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In the circuit shown in below figure, the voltage V_0 is

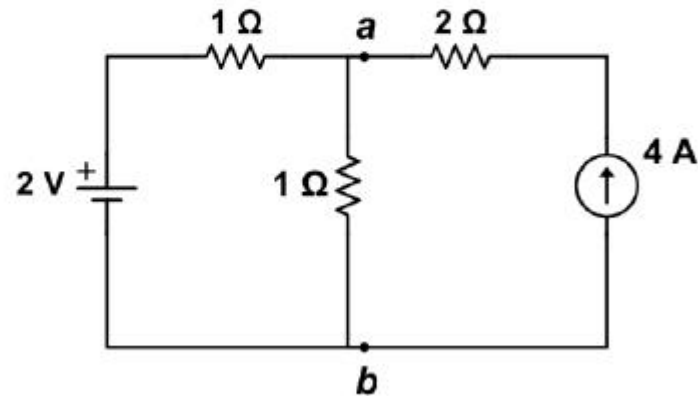


Options :

- 1. ✘ -11 V
- 2. ✔ 11 V
- 3. ✘ 5 V
- 4. ✘ -5 V

Question Number : 18 Question Id : 1298402538 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The voltage across the terminals *a* and *b* in the figure below is

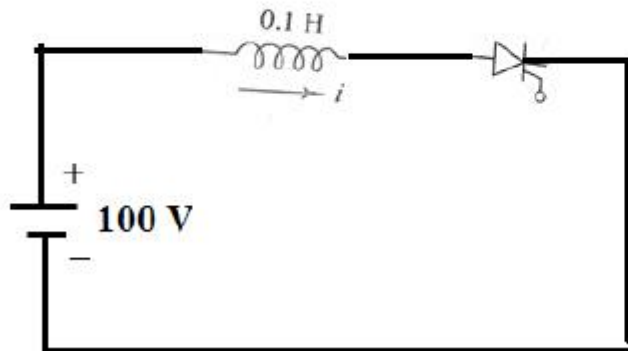


Options :

1. ✘ 6.0 V
2. ✘ 2.0 V
3. ✔ 3.0 V
4. ✘ 0.5 V

Question Number : 19 Question Id : 1298402539 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If the latching current (i) in the circuit shown in the figure is 4 mA, Obtain the minimum width of the gating pulse required to properly turn on the SCR.



Options :

1. ✘ 4ms

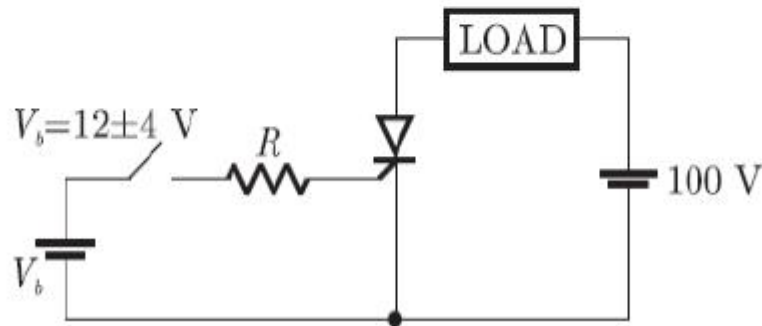
2. ✓ $4\mu\text{s}$

3. ✗ 2ms

4. ✗ $2\mu\text{s}$

Question Number : 20 Question Id : 1298402540 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The triggering circuit of a thyristor is shown in figure. The thyristor requires a gate current of 10 mA, for guaranteed turn-on. The value of R required for the thyristor to turn on reliably under all conditions of V_b variation is



Options :

1. ✗ 10000Ω

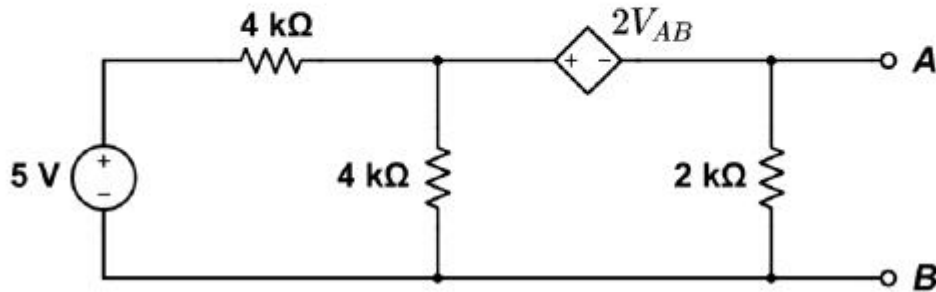
2. ✗ 1600Ω

3. ✘ 1200 Ω

4. ✔ 800 Ω

Question Number : 21 Question Id : 1298402541 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

For a circuit given below, the Thevenin's resistance across the terminals A and B is



Options :

1. ✘ 0.4 k Ω

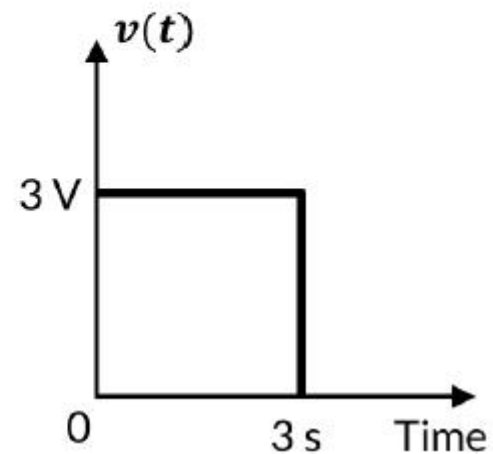
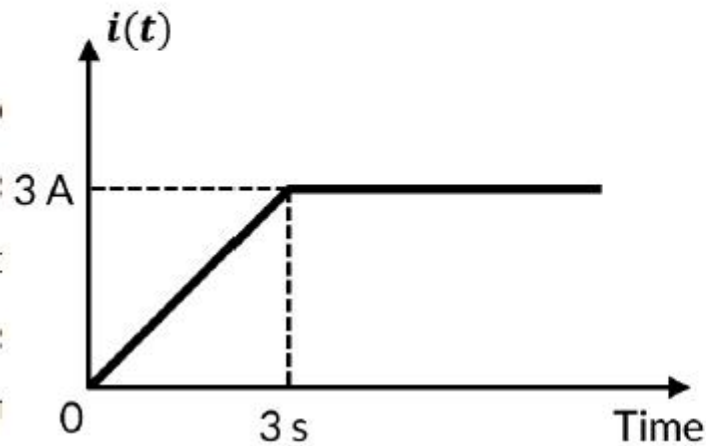
2. ✔ 0.5 k Ω

3. ✘ 0.2 k Ω

4. ✘ 1.0 k Ω

Question Number : 22 Question Id : 1298402542 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The voltage and current waveforms for a circuit element are shown in below figures. The circuit element and its value is



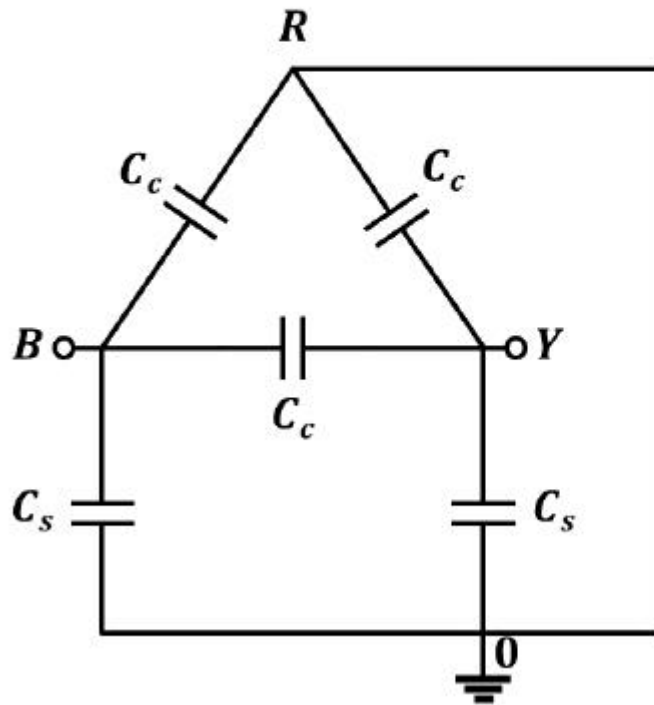
Options :

1. ✘ Resistor, 3 Ω
2. ✘ Capacitor, 3 F
3. ✔ Inductor, 3 H

4. ✖ Inductor, 1 H

Question Number : 23 Question Id : 1298402543 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

For the circuit shown in below figure, the capacitance measured between terminals B and Y will be



Options :

1. ✖ $C_c + \frac{C_s}{2}$

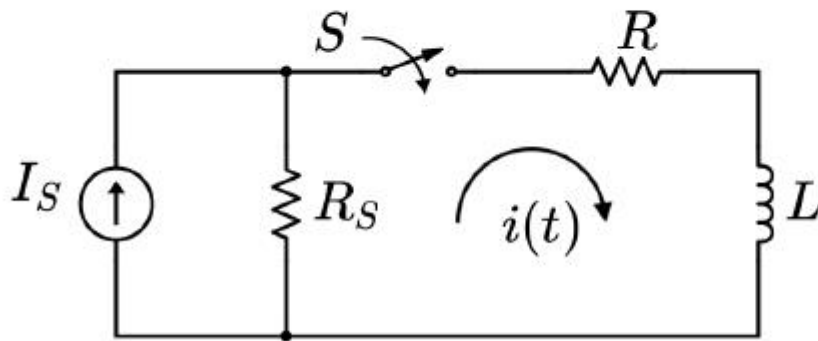
2. ✘ $C_s + \frac{C_c}{2}$

3. ✘ $3C_c + 2C_s$

4. ✔ $(C_s + 3C_c)/2$

Question Number : 24 Question Id : 1298402544 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In the following circuit the switch S is closed at $t = 0$. The rate of change of current $\frac{di}{dt} (0^+)$ is given by



Options :

1. ✘ ∞

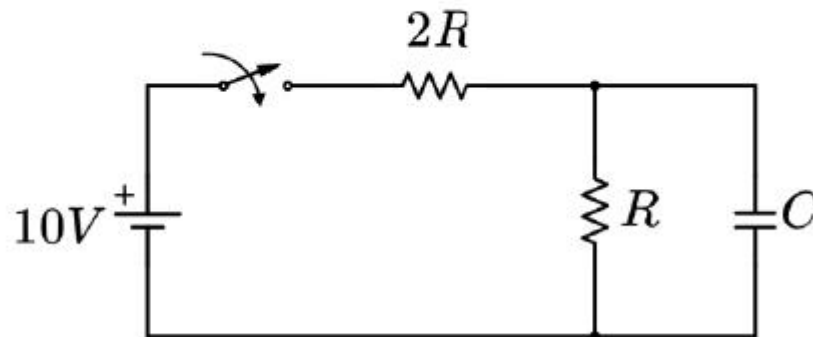
2. ✘ $\frac{(R+R_S)I_S}{L}$

3. ✔ $\frac{R_S I_S}{L}$

4. ✘ 0

Question Number : 25 Question Id : 1298402545 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The time constant of the network, shown in below figure is



Options :

1. ✔ $\frac{2RC}{3}$

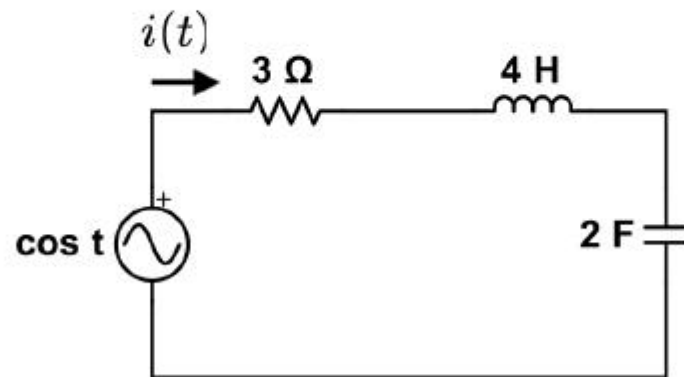
2. ✘ RC

3. ✘ $3RC$

4. ✘ $\frac{3RC}{4}$

Question Number : 26 Question Id : 1298402546 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The differential equation for the current $i(t)$ in the circuit of the below figure is



Options :

$$\frac{3 d^2 i(t)}{dt^2} + \frac{4 di(t)}{dt} + \frac{1}{2} i(t) = -\sin t$$

1. ✘

2. ✘ $\frac{d^2 i(t)}{dt^2} + \frac{4 di(t)}{dt} + 2 i(t) = \cos t$

3. ✘ $\frac{4 d^2 i(t)}{dt^2} + \frac{3 di(t)}{dt} + i(t) = \cos t$

4. ✔ $\frac{4 d^2 i(t)}{dt^2} + \frac{3 di(t)}{dt} + \frac{1}{2} i(t) = -\sin t$

Question Number : 27 Question Id : 1298402547 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Each phase of a 3 phase delta connected load has an impedance of $25\angle 60^\circ \Omega$.

The line voltage is 200 V. Determine the total power in kilowatts.

Options :

1. ✘ 3.4

2. ✔ 2.4

3. ✘ 2400

4. ✘ 3400

Question Number : 28 Question Id : 1298402548 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In series RLC circuit, $R = 5 \text{ k}\Omega$, $L = 2 \text{ H}$ and $C = \frac{1}{200} \mu\text{F}$. The resonant frequency is

Options :

1. ✓ $\frac{5 \times 10^3}{\pi} \text{ Hz}$

2. ✗ $\frac{10 \times 10^3}{\pi} \text{ Hz}$

3. ✗ $\frac{10^3}{\pi} \text{ Hz}$

4. ✗ $2 \pi \times 10^4 \text{ Hz}$

Question Number : 29 Question Id : 1298402549 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A series RLC circuit has the following parameter values : $R = 5 \Omega$, $L = 0.02 \text{ H}$, $C = 200 \mu\text{F}$. The Q factor of the circuit at resonance is

Options :

1. ✓ 2

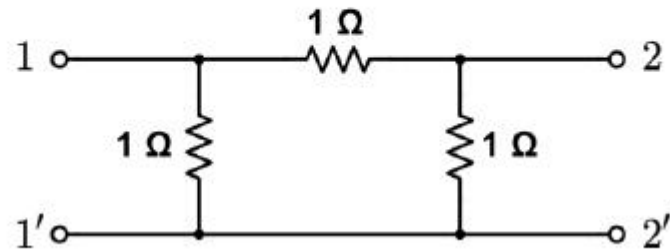
2. ✘ 0

3. ✘ 1

4. ✘ 0.2

Question Number : 30 Question Id : 1298402550 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

For the two-port network shown below, the short-circuit admittance parameter matrix is



Options :

1. ✘ $\begin{bmatrix} -1 & 2 \\ -1 & 2 \end{bmatrix}$

2. ✔ $\begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}$

3. ✘
$$\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$$

4. ✘
$$\begin{bmatrix} -2 & 1 \\ 1 & -2 \end{bmatrix}$$

Question Number : 31 Question Id : 1298402551 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Which among the following is the accurate method to determine Voltage regulation

Options :

1. ✘ Synchronous impedance method
2. ✔ Zero Power Factor method
3. ✘ Magneto-motive force method
4. ✘ ASCII method

Question Number : 32 Question Id : 1298402552 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In rotating electrical machines, when the armature rotates, there are continuous magnetic reversals. The power required for their reversals is

Options :

1. ✘ Eddy current loss
2. ✘ Resistance or ohmic loss
3. ✔ Hysteresis loss
4. ✘ Mechanical loss

Question Number : 33 Question Id : 1298402553 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

An inverted V-curve of synchronous motor shows the variation of

Options :

1. ✔ Power factor and dc excitation at constant load
2. ✘ Supply voltage and field current at constant excitation
3. ✘ Power factor and supply voltage during hunting

4. ✘ Supply voltage and excitation current at constant load

Question Number : 34 Question Id : 1298402554 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Three transformers with core of iron, aluminium and wood having identical dimensions and wound with same number of turns and have same supply. Then select the order for hysteresis losses.

Options :

1. ✘ wood > aluminium > iron
2. ✘ aluminium > iron > wood
3. ✘ iron > wood > aluminium
4. ✔ iron > aluminium > wood

Question Number : 35 Question Id : 1298402555 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Compensating winding is employed in an **ac** series motor in order to

Options :

1. ✘ Compensate for decrease in field flux

2. ✘ Increase the total torque
3. ✘ Reduce the speed of motor
4. ✔ Reduce effects of armature reaction.

Question Number : 36 Question Id : 1298402556 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

After the starting winding of a single-phase induction motor is disconnected from supply, The motor continues run on which winding

Options :

1. ✘ Rotor
2. ✘ Compensating winding
3. ✔ Running winding
4. ✘ Field

Question Number : 37 Question Id : 1298402557 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

An eight-pole armature is wound with 480 conductors. The magnetic flux and the speed are such that the average e.m.f. generated in each conductor is 2.2 V, and each conductor is capable of carrying a full-load current of 100 A. The terminal voltage on no load when the armature is lap-connected will be

Options :

1. ✓ 132 V
2. ✗ 2.2 V
3. ✗ 1056 V
4. ✗ 220V

Question Number : 38 Question Id : 1298402558 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If field current is decreased in shunt **dc** motor, the speed of the motor

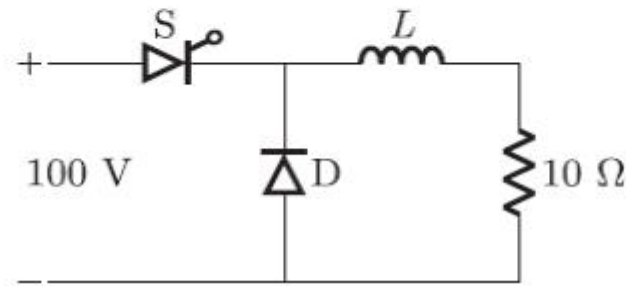
Options :

1. ✗ Decreases
2. ✓ Increases
3. ✗ Remains constant

4. ✘ Motor comes to standstill

Question Number : 39 Question Id : 1298402559 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Figure shows a chopper operating from a 100 V dc input. The duty ratio of the main switch S is 0.8. The load is sufficiently inductive so that the load current is ripple free. The average current through the diode D under steady state is



Options :

- 1. ✘ 1.6 A
- 2. ✘ 6.4 A
- 3. ✔ 8.0 A
- 4. ✘ 10.0 A

Question Number : 40 Question Id : 1298402560 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A 115 V DC shunt motor has an armature resistance of 0.22 ohm. What armature current will flow (i) When the counter emf is 108 volts (ii) If the motor load is increased so that the counter emf drops to 106 volts

Options :

1. ✓ (i) 31.8 and (ii) 40.9
2. ✗ (i) 25.8 and (ii) 20.9
3. ✗ (i) 12.8 and (ii) 10
4. ✗ (i) 2.8 and (ii) 10

Question Number : 41 Question Id : 1298402561 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A 12 pole, 3 phase alternator driven at a speed of 500 r.p.m supplies power to an 8-pole, 3 phase induction motor. If the slip of the motor, at full load is 3%, the full load speed in r.p.m of the motor is

Options :

1. ✗ 990.75

2. ✘ 820

3. ✔ 727.5

4. ✘ 550.25

Question Number : 42 Question Id : 1298402562 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is

Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If an induction motor has a slip of 2% at normal voltage, what will be the approximate slip when developing the same torque at 10% above normal voltage

Options :

1. ✘ 1.6%

2. ✘ 2%

3. ✔ 1.65%

4. ✘ 1.1%

Question Number : 43 Question Id : 1298402563 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is

Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A 4 pole lap wound DC generator has 90 slots and each slot has 6 conductors. The generator rotates at 1500 rpm and flux per pole is 3 mWb. The emf (in volts) induced will be

Options :

1. ✘ 20.25
2. ✔ 40.5
3. ✘ 81
4. ✘ 0

Question Number : 44 Question Id : 1298402564 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A 250V, 10KW, separately excited generator has an induced emf of 255V at full load. If the brush drop is 2V per brush, the armature resistance (in ohms) of the generator is:

Options :

1. ✘ 10
2. ✘ 0.5
3. ✘ 0.25

4. ✓ 0.025

Question Number : 45 Question Id : 1298402565 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

An induction motor when started on load, it does not accelerate upto full speed but runs at 1/7th of the rated speed. This is known as

Options :

1. ✗ Locking
2. ✗ Cogging
3. ✗ Plumming
4. ✓ Crawling

Question Number : 46 Question Id : 1298402566 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A 230 V, 50 Hz, 4-pole, single-phase induction motor is rotating in the clockwise (forward) direction at a speed of 1425 rpm. If the rotor resistance at standstill is 7.8Ω , then the effective rotor resistance in the backward branch of the equivalent circuit will be

Options :

1. ✓ 4Ω

2. ✗ 2Ω

3. ✗ 78Ω

4. ✗ 156Ω

Question Number : 47 Question Id : 1298402567 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

An induction motor can be said analogous to

Options :

1. ✗ DC Generator

2. ✗ Synchronous motor

3. ✓ Transformer

4. ✗ Stepper motor

Question Number : 48 Question Id : 1298402568 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

What is the increase in torque expressed as percentage of initial torque, if the current drawn by a DC series motor is increased from 10A and 12A (neglect saturation)

Options :

1. ✘ 41%
2. ✘ 21%
3. ✘ 25%
4. ✔ 44%

Question Number : 49 Question Id : 1298402569 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The torque produced if a DC series motor is accidentally connected to single phase ac supply voltage.

Options :

1. ✔ Pulsating and unidirectional
2. ✘ Steady and unidirectional
3. ✘ Oscillating

4. ✘ Zero

Question Number : 50 Question Id : 1298402570 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The main advantage of auto transformer over a two winding transformer is

Options :

1. ✘ Hysteresis losses are reduced
2. ✔ Saving in winding material
3. ✘ Copper losses are negligible
4. ✘ Eddy losses are totally eliminated

Question Number : 51 Question Id : 1298402571 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

What should be the value of voltage regulation and transmission efficiency for a good transmission line _____ respectively

Options :

1. ✘ High and High

2. ✘ Low and Low
3. ✘ High and Low
4. ✔ Low and High

Question Number : 52 Question Id : 1298402572 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In a 33 kV overhead line, there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 15% of self-capacitance of each insulator, find the string efficiency.

Options :

1. ✘ 93%
2. ✘ 90%
3. ✔ 82%
4. ✘ 78%

Question Number : 53 Question Id : 1298402573 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Electromagnetic induction in communication line due to power line can be reduced to zero when

Options :

1. ✓ Power line is transposed
2. ✗ Power line conductor size is increased
3. ✗ Hollow conductor is used
4. ✗ Currents are not balanced

Question Number : 54 Question Id : 1298402574 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

What is the disruptive critical voltage for bad weather condition if the disruptive critical voltage during fair weather condition is 115 kV ?

Options :

1. ✗ 120 kV
2. ✗ 115 kV
3. ✗ 101 kV

4. ✓ 92 kV

Question Number : 55 Question Id : 1298402575 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If transmission line conductor size is increased then the value of disruptive critical voltage and corona loss will be _____ respectively.

Options :

1. ✗ High and High
2. ✗ Low and Low
3. ✓ High and Low
4. ✗ Low and High

Question Number : 56 Question Id : 1298402576 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The maximum and minimum stresses in the dielectric of a single core cable are 50 kV/cm and 15 kV/cm respectively. If the conductor diameter is 3 cm, find the thickness of insulation of cable

Options :

1. ✘ 4 cm
2. ✔ 3.5 cm
3. ✘ 3 cm
4. ✘ 2.5 cm

Question Number : 57 Question Id : 1298402577 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A generator is rated 100 MVA, 11 kV. It has reactance of 2.5 p.u. Find the ohmic value of reactance of generator

Options :

1. ✘ 5.833Ω
2. ✘ 4.581Ω
3. ✘ 3.762Ω
4. ✔ 3.025 Ω

Question Number : 58 Question Id : 1298402578 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For the transmission system with the following specifications, determine Y_{33} element of bus admittance matrix

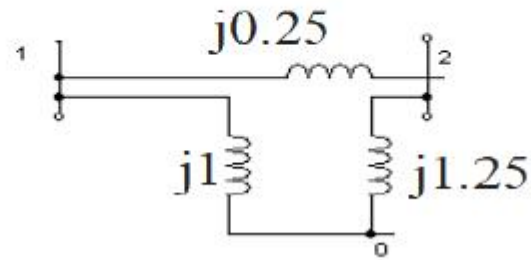
Line p-q	Line admittance	Total line charging admittance
1-2	$0.7337-j4.89$	$j 0.04$
1-3	$19.9649-j39.929$	$j 0.02$
2-3	$0.3301-j3.3003$	$j 0.06$

Options :

1. ✓ $20.295-j43.189$
2. ✗ $20.698-j44.819$
3. ✗ $1.06-j8.196$
4. ✗ $21.028-j48.079$

Question Number : 59 Question Id : 1298402579 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Obtain Z_{21} element of bus impedance matrix for the network shown.



Options :

1. ✘ $j0.625$
2. ✘ $j0.6$
3. ✘ $j0.55$
4. ✔ $j0.5$

Question Number : 60 Question Id : 1298402580 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If the number of buses (n) in a power system is 30, number of PV buses (m) is 6, 1st bus is considered as slack bus. What is the order of J_2 matrix in Newton Raphson load flow method

Options :

1. ✘ 30 x 24

2. ✘ 30 x 30

3. ✔ 29 x 23

4. ✘ 23 x 24

Question Number : 61 Question Id : 1298402581 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In which load flow analysis, the number of iteration increases as number of buses increases

Options :

1. ✘ Newton Raphson load flow method

2. ✘ Decoupled load flow method

3. ✘ Fast Decoupled load flow method

4. ✔ Gauss seidel load flow method

Question Number : 62 Question Id : 1298402582 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The output voltage waveform of a three - phase square-wave inverter contains

Options :

1. ✘ Only even harmonics
2. ✘ Both odd and even harmonics
3. ✔ Only odd harmonics
4. ✘ Only triple harmonics

Question Number : 63 Question Id : 1298402583 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The unbalanced line currents are $I_a = 44-j33$ A, $I_b = -32-j24$ A, $I_c = -40+j25$ A.
The value of zero sequence component I_{a0} is

Options :

1. ✘ $40.80-j8.78$ A
2. ✘ $12.5-j13.49$ A
3. ✔ $-9.33-j10.67$ A
4. ✘ $30.6-j15.72$ A

Question Number : 64 Question Id : 1298402584 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Swing curve is drawn between

Options :

1. ✓ Torque angle and time
2. ✗ Frequency and time
3. ✗ Voltage and torque angle
4. ✗ Power and torque angle

Question Number : 65 Question Id : 1298402585 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A 2220 MVA, 24 kV and 60 Hz synchronous machine is connected to an infinite bus through transformer and double circuit transmission line. $X_g' = j0.30$ p.u, $X_{\text{transformer}} = j0.20$ p.u, the reactance of each transmission line is 0.3 p.u, all reactances are calculated to a base of the rating of the synchronous machine. A three-phase fault occurs at the sending end of one of the lines, Find the total reactance of the power system network during post fault conditions

Options :

1. ✘ $j0.65$
2. ✔ $j0.8$
3. ✘ $j0.15$
4. ✘ $j0.3$

Question Number : 66 Question Id : 1298402586 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A 3-phase transformer of 0.4 kV/11 kV line volts is connected in star/delta. The protective transformers on 0.4 kV side have a current ratio of 550/5. What should be the CT ratio on 11 kV side

Options :

1. ✔ 20:8.66
2. ✘ 5:1.732
3. ✘ 20:5
4. ✘ 8.66:1.732

Question Number : 67 Question Id : 1298402587 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Operating characteristic of MHO relay is obtained from the following torque equation

Options :

1. ✘ $T = K_1 V^2 - K_2 I^2 - K_3$
2. ✘ $T = KV \cos(\phi - \alpha) - K_3$
3. ✘ $T = K_1 I^2 - K_2 V \cos(\phi - \alpha) - K_3$
4. ✔ $T = K_1 V \cos(\phi - \alpha) - K_2 V^2 - K_3$

Question Number : 68 Question Id : 1298402588 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Determine the value of plug setting multiplier of a 5-ampere, 3-second over current relay having a current setting of 125% connected to supply circuit through a 400/5 current transformer when the circuit carries a fault current of 4000 A

Options :

1. ✘ 10

2. ✓ 8

3. ✘ 6

4. ✘ 4

Question Number : 69 Question Id : 1298402589 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A circuit breaker is rated as 3500 A, 3000 MVA, 66 kV, 3-second, 3-phase oil circuit breaker. Symmetrical breaking current is 26243 A, find the making current.

Options :

1. ✘ 39323 A

2. ✘ 77147 A

3. ✘ 64214 A

4. ✓ 66919 A

Question Number : 70 Question Id : 1298402590 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The shunt-connected converter in UPFC FACTS device is used for the following purpose

Options :

1. ✘ Supply the reactive power demand of series connected converter
2. ✔ Supply the real-power demand of series connected converter
3. ✘ Supply the current to series connected converter
4. ✘ Absorb real-power from the series connected converter

Question Number : 71 Question Id : 1298402591 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The principle of homogeneity and superposition are applied to verify

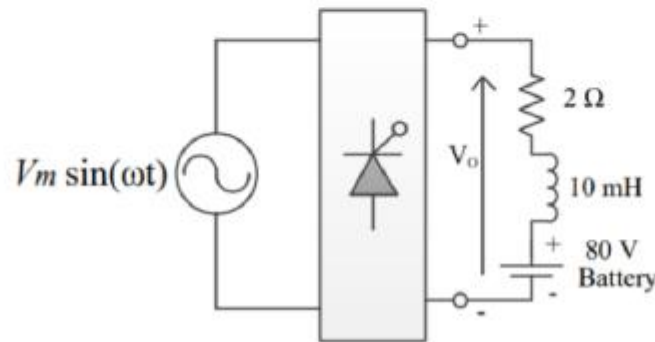
Options :

1. ✘ Dynamic property of systems
2. ✘ Time variant property of systems
3. ✔ Linearity property of systems
4. ✘ Inverse property of systems

Question Number : 72 Question Id : 1298402592 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A phase controlled single phase rectifier, supplied by an ac source, feeding power to an R-L-E load as shown in Figure. The rectifier output voltage has an average value given by $V_o = \frac{V_m}{2\pi} (3 + \cos\alpha)$ where $V_m = 80\pi$ Volts and α is the firing angle. If the power delivered to the lossless battery is 1600 W, α in degree is



Options :

1. ✘ 45°
2. ✔ 90°
3. ✘ 135°
4. ✘ 83.6°

Question Number : 73 Question Id : 1298402593 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The value of anode current required to maintain the conduction of an SCR even though the gate signal is removed is called as the

Options :

1. ✘ Holding current
2. ✔ Latching current
3. ✘ Switching current
4. ✘ Peak anode current

Question Number : 74 Question Id : 1298402594 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The overall transfer function of three blocks in parallel are

Options :

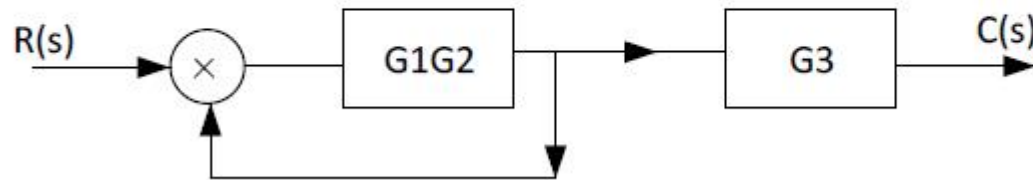
1. ✘ Division of individual gain
2. ✔ Sum of individual gain

3. ✘ Square root of individual gain

4. ✘ Product of individual gain

Question Number : 75 Question Id : 1298402595 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

For the block diagram given in the following figure, the expression of C/R is:



Options :

1. ✔ $G1G2G3/1-G2G1$

2. ✘ $G1G2/1-G1G2G3$

3. ✘ $G1G2G3/1-G1G2G3$

4. ✘ $G1G2/G3(1-G1G2)$

Question Number : 76 Question Id : 1298402596 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is

Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The relationship between an input and output variable of a signal flow graph is given by the net gain between the input and output node is known as the

Options :

1. ✘ Stability
2. ✔ Overall gain of the system
3. ✘ Bandwidth
4. ✘ Speed

Question Number : 77 Question Id : 1298402597 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is

Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

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

Options :

1. ✘ Stable
2. ✘ Marginally stable
3. ✔ Unstable

4. ✘ Linear

Question Number : 78 Question Id : 1298402598 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The characteristic equation of a feedback control system is $s^3 + Ks^2 + 9s + 18 = 0$.

When the system is marginally stable, the frequency (rad/s) of the sustained oscillation

Options :

1. ✘ 1

2. ✘ 1.414

3. ✘ 1.732

4. ✔ 3

Question Number : 79 Question Id : 1298402599 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Lag compensation leads to:

Options :

1. ✘ Increases bandwidth

2. ✘ Attenuation
3. ✔ Increases damping factor
4. ✘ Second order

Question Number : 80 Question Id : 1298402600 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

When human being tries to approach an object, his brain acts as,

Options :

1. ✘ An error measuring device
2. ✔ A controller
3. ✘ An actuator
4. ✘ An amplifier

Question Number : 81 Question Id : 1298402601 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A dc-dc buck converter operates in continuous conduction mode. Input voltage is 48 V and it feeds a resistive load of 24 Ω . The switching frequency of the converter is 250 Hz. If the switch on duration is 1 ms, the load power is _____.

Options :

1. ✓ 24 W
2. ✗ 6 W
3. ✗ 48 W
4. ✗ 12 W

Question Number : 82 Question Id : 1298402602 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Effect of feedback on sensitivity is minimum in

Options :

1. ✗ Open loop control system
2. ✓ Closed loop control system
3. ✗ Doesn't depend on open or closed loop systems

4. ✘ Electrical Systems

Question Number : 83 Question Id : 1298402603 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Consider a system if represented by state space equation and $x_1(t) = x_2(t)$, then the system is

Options :

1. ✔ Uncontrollable
2. ✘ Controllable
3. ✘ Observable
4. ✘ Unstable

Question Number : 84 Question Id : 1298402604 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The open-loop function of a unity-gain feedback control system is given by

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

The gain margin of the system in dB is given by

Options :

1. ✘ 0

2. ✔ ∞

3. ✘ 10

4. ✘ 20

Question Number : 85 Question Id : 1298402605 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

An LTI system is stable if

Options :

1. ✘ Homogeneity principle holds good

2. ✘ Superposition principle holds good

3. ✔ System in excited by the bounded input, the output is also bounded

4. ✘ System in excited by the bounded input, the output is unbounded

Question Number : 86 Question Id : 1298402606 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A Manganin swamp resistance is connected in series with a moving coil ammeter consisting of a milli-ammeter and a suitable shunt in order to

Options :

1. ✓ Minimise the effect of temperature variation
2. ✗ Obtain large deflecting torque
3. ✗ Reduce the size of the meter
4. ✗ Minimise the effect of stray magnetic fields

Question Number : 87 Question Id : 1298402607 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The effect of stray magnetic field on the actuating torque of a portable instrument is maximum when the operating field of the instrument and the stray fields are

Options :

1. ✗ Perpendicular
2. ✓ Parallel

3. ✘ Inclined at 60°

4. ✘ Inclined at 30°

Question Number : 88 Question Id : 1298402608 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A reading of 120 is obtained when standard inductor was connected in the circuit of a Q-meter and the variable capacitor is adjusted to a value of 300 pF. A lossless capacitor of unknown value C_x is then connected in parallel with the variable capacitor and the same reading was obtained when the variable capacitor is readjusted to a value of 200 pF. The value of C_x in pF is

Options :

1. ✔ 100

2. ✘ 200

3. ✘ 300

4. ✘ 500

Question Number : 89 Question Id : 1298402609 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A dc potentiometer is designed to measure upto 2V with a slide wire of 800 mm. A standard cell of emf 1.18 V obtains balance at 600 mm. A test cell is seen to obtain balance at 680 mm. The emf of the test cell is

Options :

1. ✘ 1.00 V
2. ✔ 1.34 V
3. ✘ 1.50 V
4. ✘ 1.70 V

Question Number : 90 Question Id : 1298402610 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

A moving coil of a meter has 100 turns, and a length and depth of 10 mm and 20 mm respectively. It is positioned in a uniform radial flux density of 200 mT. The coil carries a current of 50 mA. The torque on the coil is

Options :

1. ✔ 200 μNm
2. ✘ 100 μNm

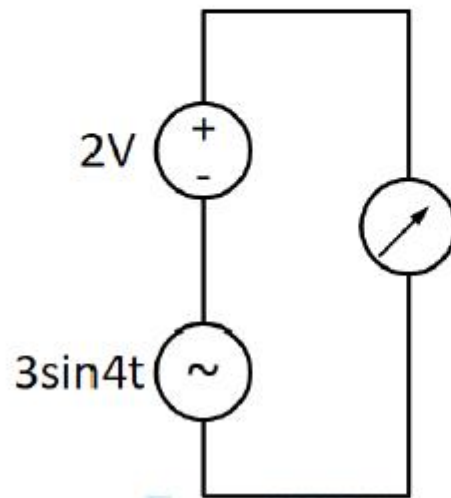
3. ✘ $2 \mu Nm$

4. ✘ $1 \mu Nm$

Question Number : 91 Question Id : 1298402611 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A PMMC voltmeter is connected across a series combination of a DC voltage source $V_1 = 2V$ and AC voltage source $V_2(t) = 3 \sin 4t$ V. The meter read as



Options :

1. ✘ $\left(2 + \frac{\sqrt{3}}{2}\right) V$

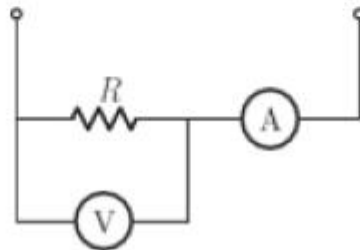
2. ✘ $\frac{\sqrt{17}}{2} \text{ V}$

3. ✔ 2 V

4. ✘ 5 V

Question Number : 92 Question Id : 1298402612 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The set-up in the figure is used to measure resistance R . The ammeter and voltmeter resistances are 0.01Ω and 2000Ω , respectively. Their readings are 2 A and 180 V, respectively, giving a measured resistance of 90 W. The percentage error in the measurement is



Options :

1. ✘ 2.25 %

2. ✘ 2.35 %

3. ✘ 4.55 %

4. ✔ 4.71%

Question Number : 93 Question Id : 1298402613 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In a vibrating reed frequency meter, the natural frequencies of two adjacent reeds have a difference of

Options :

1. ✘ 0.1Hz

2. ✘ 0.25 Hz

3. ✔ 0.5 Hz

4. ✘ 1.5 Hz

Question Number : 94 Question Id : 1298402614 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A Wheatstone bridge is balanced with all four resistances equal to $1\text{ k}\Omega$ each. The bridge excitation voltage is 100 V . Value of one of the arm's resistances is changed to $1010\ \Omega$. The output voltage is measured with a voltmeter of infinite resistance. The bridge sensitivity is

Options :

1. ✘ $10\text{ V}/\Omega$
2. ✘ $10\text{ mV}/\Omega$
3. ✘ $2.5\text{ mV}/\Omega$
4. ✔ $0.25\text{ mV}/\Omega$

Question Number : 95 Question Id : 1298402615 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In an energy meter braking torque is produced to

Options :

1. ✘ Safe guard it against creep
2. ✘ Brake the instrument

3. ✘ Bring energy meter to stand still

4. ✔ Maintain steady speed and equal to driving torque

Question Number : 96 Question Id : 1298402616 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An energy meter having a meter constant of 1200 rev/kWh, makes 20 revolutions in 30 seconds for a constant load. The load in kw is

Options :

1. ✘ 1

2. ✔ 2

3. ✘ 0.5

4. ✘ 10

Question Number : 97 Question Id : 1298402617 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

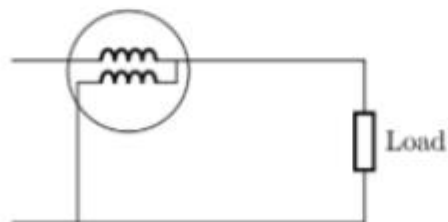
In an Anderson bridge, the unknown inductance is measured in terms of known

Options :

1. ✘ Inductance and resistance
2. ✔ Capacitance and resistance
3. ✘ Resistance
4. ✘ Inductance

Question Number : 98 Question Id : 1298402618 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The coils of a wattmeter have resistances of 0.01Ω and 1000Ω , their inductance may be neglected. The wattmeter is connected as shown in the figure. to measure the power consumed by a load which draws 25 A at power factor 0.8 . The voltage across the load terminals is 30 V . The percentage error on the wattmeter reading is



Options :

1. ✓ 0.15

2. ✗ 0.6

3. ✗ 1.5

4. ✗ 6

Question Number : 99 Question Id : 1298402619 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The primary winding of a Current transformer has

Options :

1. ✗ Large number of turns

2. ✗ No turns at all

3. ✓ A few turns

4. ✗ Intermediate number of turns

Question Number : 100 Question Id : 1298402620 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

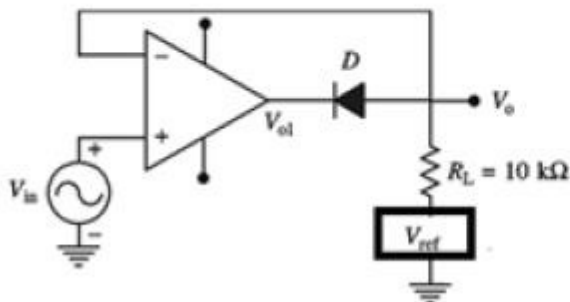
The sweep generator of a CRO is used to produce

Options :

1. ✘ Sinusoidal voltage for the horizontal deflection of the electron beam
2. ✘ Sawtooth voltage for the vertical deflection of the electron beam
3. ✘ Sinusoidal voltage for the vertical deflection of the electron beam
4. ✔ Sawtooth voltage for the horizontal deflection of the electron beam

Question Number : 101 Question Id : 1298402621 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

What happens if the input voltage is higher than reference voltage in a positive clipper circuit as shown in Fig.



Options :

1. ✔ Output voltage = Reference voltage

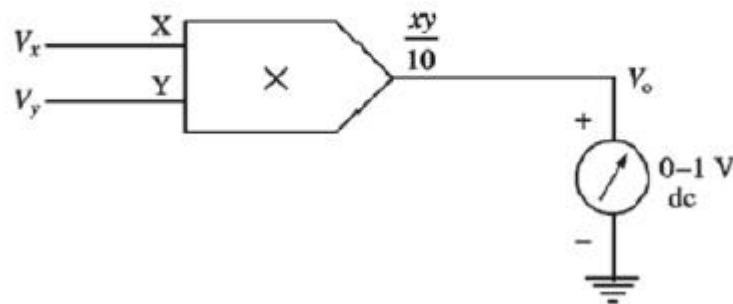
2. ✘ Output voltage = Saturation voltage

3. ✘ Output voltage = Input voltage

4. ✘ Zero

Question Number : 102 Question Id : 1298402622 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If the inputs to the multiplier in the circuit shown are $V_x = 3 \sin(2000 \pi t)$ and $V_y = 3 \sin(2000 \pi t + 45^\circ)$, the voltmeter reading will be



Options :

1. ✘ 23 V

2. ✘ 1 V

3. ✘ 0.63 V

4. ✓ 0.32 V

Question Number : 103 Question Id : 1298402623 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

An opamp has unity gain bandwidth of 5 MHz, what is its rise time

Options :

1. ✗ 30 ns

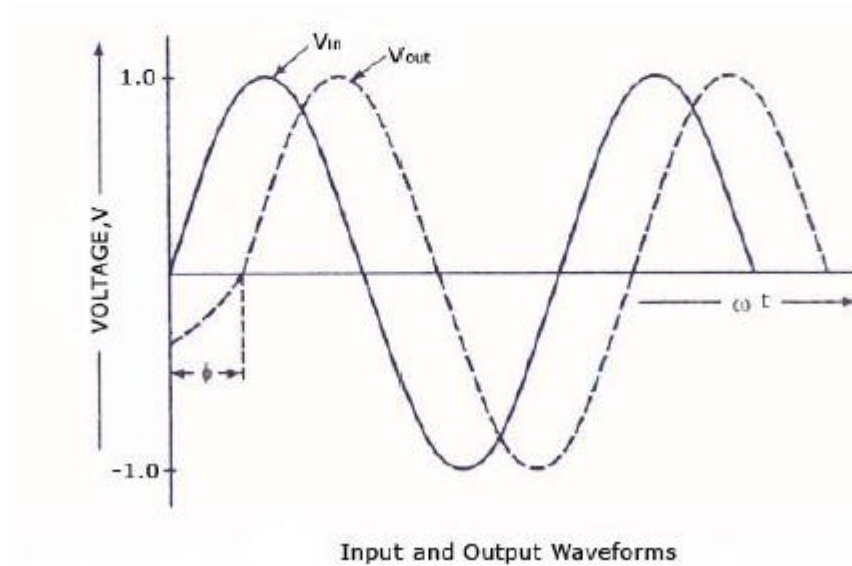
2. ✗ 350 ns

3. ✓ 70 ns

4. ✗ 100 ns

Question Number : 104 Question Id : 1298402624 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A circuit generates the below waveform as output (V_{out}) for a given input (V_{in}). Identify the type of circuit



Options :

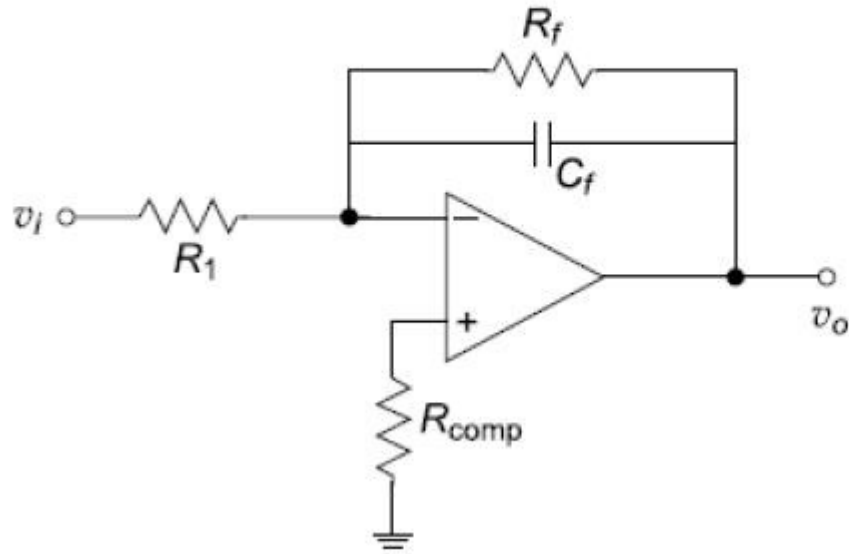
1. ✘ Low-pass filter
2. ✘ High-pass filter
3. ✔ All-pass filter
4. ✘ Band-pass filter

Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For a practical integrator shown below, given $R_1=10\text{ K}\Omega$, $R_f = 100\text{ K}\Omega$ and

$C_f=10\text{ nf}$, determine the lower frequency limit of integration

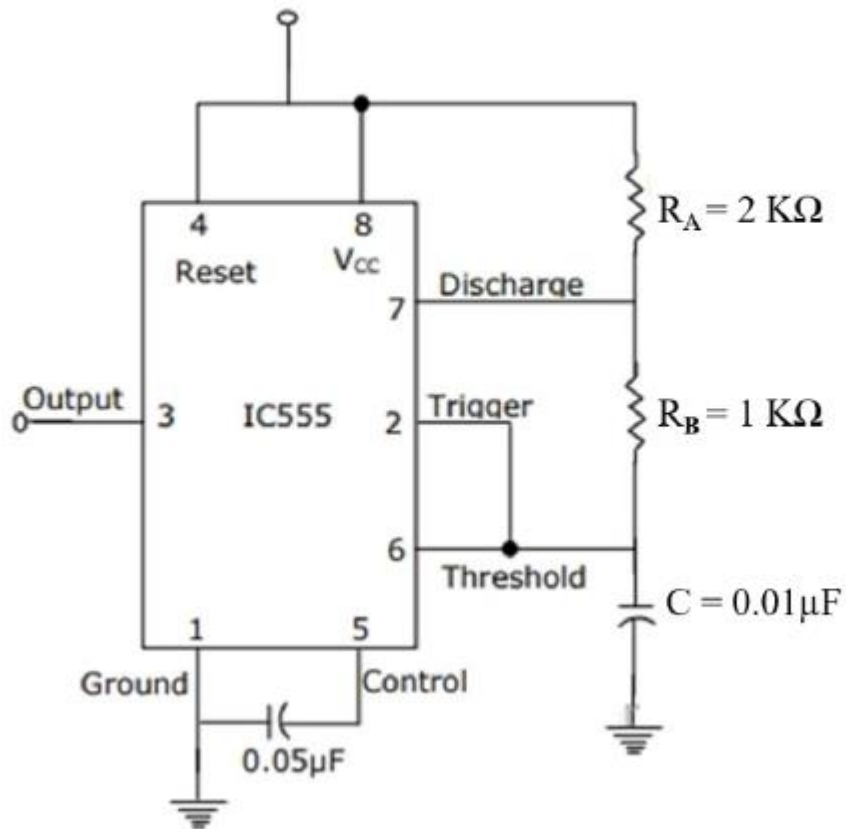


Options :

1. ✘ 30 Hz
2. ✘ 84 Hz
3. ✘ 109 Hz
4. ✔ 159 Hz

Question Number : 106 Question Id : 1298402626 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In the astable multivibrator circuit as shown in the figure, the frequency of oscillation at the output pin 3 is _____ kHz



Options :

20.56

1. ✘

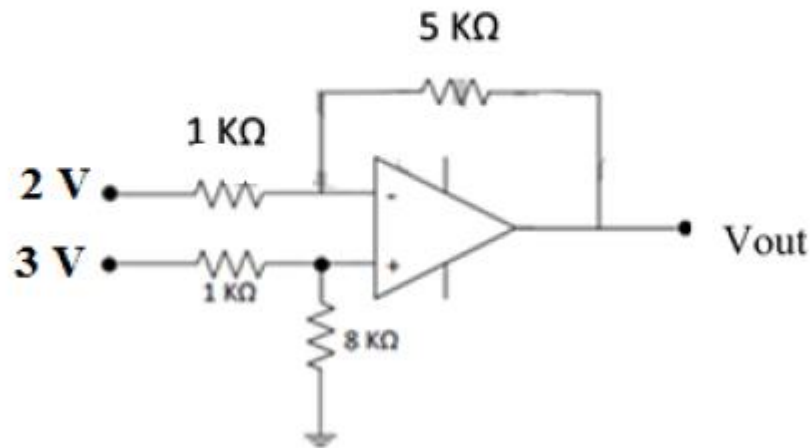
2. ✓ 36.23

3. ✗ 45.50

4. ✗ 50

Question Number : 107 Question Id : 1298402627 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

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



Options :

1. ✗ 1V

2. ✓ 6 V

3. ✗ 14 V

4. ✗ 17 V

Question Number : 108 Question Id : 1298402628 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A half wave rectifier is equivalent to

Options :

1. ✗ Clamping circuit

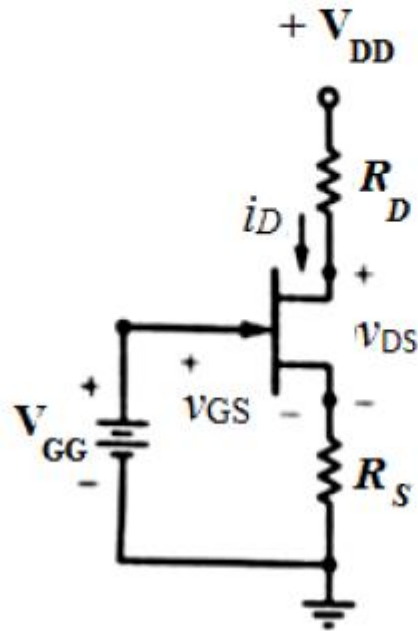
2. ✓ Clipper circuit

3. ✗ Clamping circuit with negative bias

4. ✗ Clamping circuit with positive bias

Question Number : 109 Question Id : 1298402629 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

For the circuit as shown in the fig. the JFET has $I_{DSS} = 16 \text{ mA}$ and $V_p = -4 \text{ V}$. Given that $V_{DD} = 16 \text{ V}$, $V_{GG} = 0 \text{ V}$ and $R_D = R_S = 500 \Omega$. The drain current I_D will be



Options :

1. ✘ 2 mA
2. ✔ 4 mA
3. ✘ 5 mA
4. ✘ 7 mA

Question Number : 110 Question Id : 1298402630 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For the active operation of a pnp BJT, the base must be _____ with respect to the emitter and _____ with respect to the collector.

Options :

1. ✘ Positive, negative
2. ✘ Positive, positive
3. ✔ Negative, positive
4. ✘ Negative, negative

Question Number : 111 Question Id : 1298402631 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The intrinsic carrier concentration of silicon sample at 300 K is $1.5 \times 10^{16} / \text{m}^3$. If after doping, the number of majority carriers is $5 \times 10^{20} / \text{m}^3$, the minority carrier density is

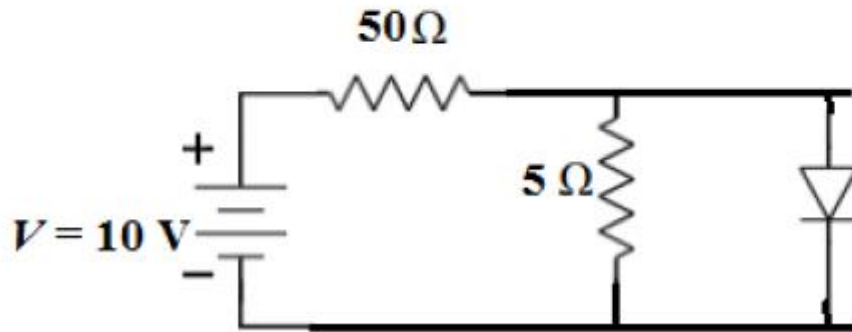
Options :

1. ✔ $4.50 \times 10^{11} / \text{m}^3$

- 2. ✘ $3.33 \times 10^4 / \text{m}^3$
- 3. ✘ $5.00 \times 10^{20} / \text{m}^3$
- 4. ✘ $3.00 \times 10^5 / \text{m}^3$

Question Number : 112 Question Id : 1298402632 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Find the current flowing through the diode as shown in below circuit. Assume the diode to be ideal



Options :

- 1. ✘ 0.1 A
- 2. ✔ 0.2 A

3. ✘ 0.3 A

4. ✘ 0.4 A

Question Number : 113 Question Id : 1298402633 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a Zener diode,

Options :

1. ✘ Only p-region is heavily doped

2. ✘ Only n-region is heavily doped

3. ✔ Both p and n-regions are heavily doped

4. ✘ Both p and n-regions are lightly doped

Question Number : 114 Question Id : 1298402634 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Find the correct match between Group I and Group II

Group I	Group II
(A) Varactor Diode	(i) Voltage reference
(B) PIN Diode	(ii) High frequency switch
(C) Zener Diode	(iii) Tuned circuits
(D) Schottky Diode	(iv) Current controlled attenuator

Options :

1. ✘ A – iv ; B – ii ; C – i ; D – iii
2. ✘ A – ii ; B – iv ; C – i ; D – iii
3. ✔ A – iii ; B – iv ; C – i ; D – ii
4. ✘ A – i ; B – iii ; C – ii ; D – iv

Question Number : 115 Question Id : 1298402635 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A counter which counts from zero to six has three flip-flops and a combinational logic circuit of 2-input gate(s). The combinational logic circuit consists of

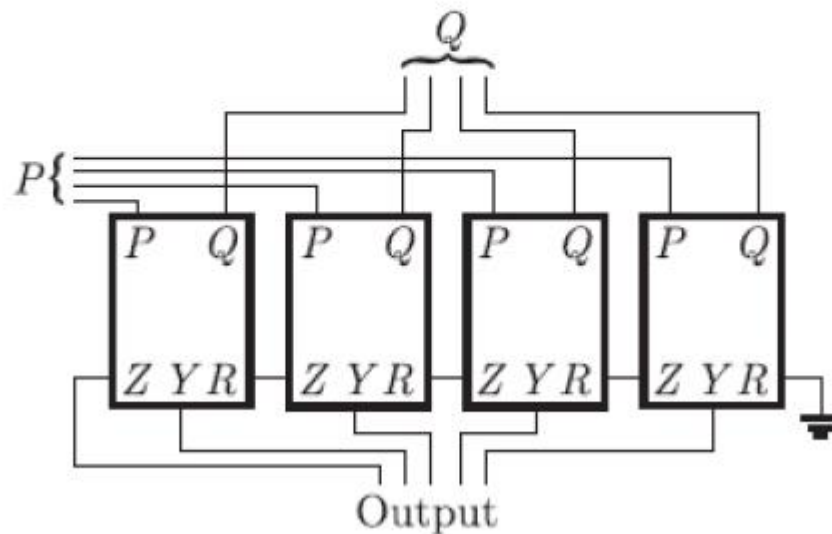
Options :

1. ✘ One AND gate

- 2. ✓ Two AND gates
- 3. ✗ One OR gate
- 4. ✗ One AND gate and one OR gate

Question Number : 116 Question Id : 1298402636 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The circuit in the figure has 4-boxes each described by inputs P, Q, R and outputs Y, Z with $Y = P \oplus Q \oplus R$ and $Z = RQ + \bar{P}R + Q\bar{P}$. The circuit acts as a



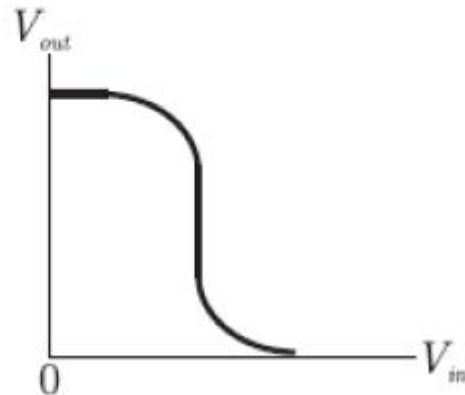
Options :

- 1. ✗ 4 bit adder giving $P + Q$

2. ✓ 4 bit subtractor giving $P - Q$
3. ✘ 4 bit subtractor giving $Q - P$
4. ✘ 4 bit adder giving $P + Q + R$

Question Number : 117 Question Id : 1298402637 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The given voltage transfer characteristic curve belongs to



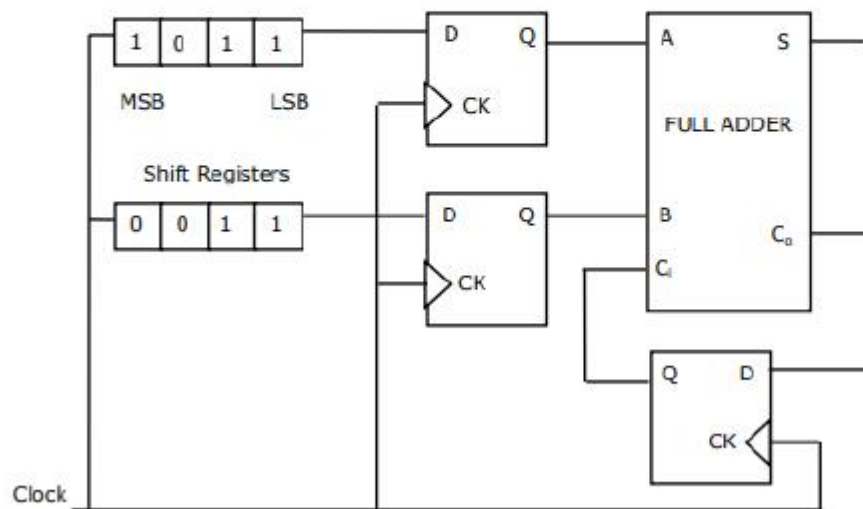
Options :

1. ✘ a BJT inverter
2. ✓ a CMOS inverter

3. ✘ an NMOS inverter with depletion mode transistor as load
4. ✘ an NMOS inverter with enhancement mode transistor as load

Question Number : 118 Question Id : 1298402638 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The circuit shown below consists of two 4-bit parallel-in serial-out shift registers. The data loaded in shift registers (as shown below) are used to feed the data to a full adder. Initially, all the flip-flops are in clear state. After applying two clock pulses, the output of the full adder is



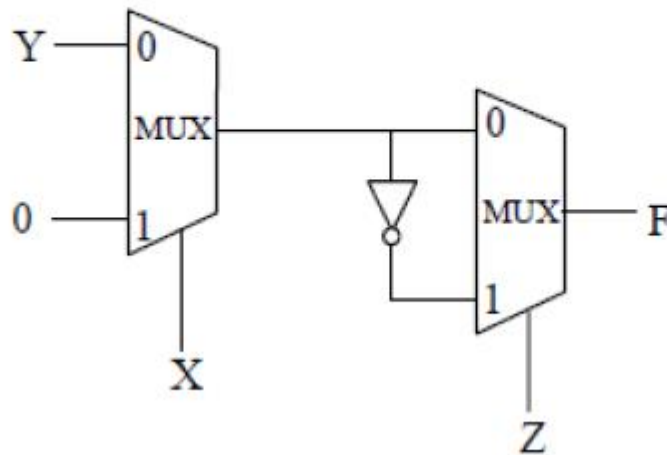
Options :

1. ✘ Sum (S) = 0 , C_{out} (C_o) = 0

2. ✘ Sum (S) = 0 , C_{out} (C_o) = 1
3. ✘ Sum (S) = 1 , C_{out} (C_o) = 0
4. ✔ Sum (S) = 1 , C_{out} (C_o) = 1

Question Number : 119 Question Id : 1298402639 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Consider the circuit shown in the figure. The Boolean expression F implemented by the circuit is



Options :

1. ✔ $\bar{x}Y\bar{Z} + XZ + \bar{Y}Z$

2. ✘ $\bar{x}Y\bar{Z} + XY + \bar{Y}Z$

3. ✘ $\bar{x}\bar{Y}\bar{Z} + XY + \bar{Y}Z$

4. ✘ $\bar{X}Y\bar{Z} + XZ + \bar{Y}Z$

Question Number : 120 Question Id : 1298402640 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A full-adder can be implemented with half-adders and OR gates. A 4-bit parallel full- adder without any initial carry requires

Options :

1. ✘ 8 half-adders and 4-OR gates

2. ✘ 8 half-adders and 3-OR gates

3. ✘ 7 half-adders and 4-OR gates

4. ✔ 7 half-adders and 3-OR gates