

Question Paper Preview

Question Paper Name:	Electrical Engineering 3rd May 2019 S2
Subject Name:	Electrical Engineering
Duration:	120
Share Answer Key With Delivery Engine:	Yes
Actual Answer Key:	Yes

Electrical Engineering

Display Number Panel:	Yes
Group All Questions:	No

Question Number : 1 Question Id : 2501071201 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The eigen values of $\begin{bmatrix} 1 & 2 & 3 \\ 0 & 4 & 5 \\ 0 & 0 & 6 \end{bmatrix}$ are

Options :

1. 1,2,3

2. 3,4,5

3. 1,4,6

4. 3,5,6

Question Number : 2 Question Id : 2501071202 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

For $0 \leq x < \infty$, the maximum value of $f(x) = e^{-x} - 2e^{-2x}$ occurs at $x = \underline{\hspace{2cm}}$.

Options :

1. $\log_e 4$

2. $\log_e 2$

3. $\log_e 8$

4. 0

Question Number : 3 Question Id : 2501071203 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If $p = \frac{\partial z}{\partial x}$, $q = \frac{\partial z}{\partial y}$ then the partial differential equation of $px^2 + qy^2 = z^3$ is _____.

Options :

1. linear with order 1 and degree 1

2. linear with order 1 and degree 2

3. non linear with order 1 and degree 1

4. nonlinear with order 1 and degree 2

Question Number : 4 Question Id : 2501071204 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} + y = 0$, $y(0) = 0$ and $y(1) = 0$ then $y(3) =$ _____.

Options :

1. -1

2. 0

3. 1

4. 4

The relation $|3-z|+|3+z|=5$ represents _____.

Options :

1. a circle
2. a parabola
3. a hyperbola
4. an ellipse

The integral $\int_{-i}^i \frac{1}{z} dz$ has the value _____.

Options :

1. 0
2. πi
3. $2\pi i$
4. $2\log i$

A problem in mechanics is given to three students A, B and C whose chances of solving it are $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$ respectively. What is the probability that the problem will be solved if all of them try?

Options :

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

2. $\frac{3}{4}$

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

4. $\frac{12}{13}$

Question Number : 8 Question Id : 2501071208 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If a random variable x follows Poisson distribution such that $P(X = 1) = P(X = 2)$ then the mean of the distribution is _____.

Options :

1. 0

2. 1

3. 2

4. 0.5

Question Number : 9 Question Id : 2501071209 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following method is not linearly convergent?

Options :

1. Bisection Method

2. Regula falsi Method

3. Iterative Method

Secant Method

4.

Question Number : 10 Question Id : 2501071210 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Let $\frac{dy}{dx} = x - y, y(0) = 0, h = 0.1$. By Euler's method the value of $y(0.1)$ is ____.

Options :

1. 0
2. 0.1
3. 0.01
4. 0.031

Question Number : 11 Question Id : 2501071211 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

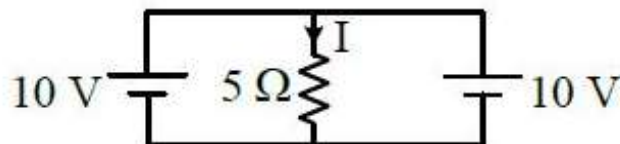
A unit step voltage is applied across an inductor. The current through the inductor will be

Options :

1. Zero for all time
2. A step function
3. A ramp function
4. An impulse function

Question Number : 12 Question Id : 2501071212 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

For the given circuit, determine the current I,



Options :

1. 1 A
2. 2 A
3. 3 A
4. circuit does not exist

Question Number : 13 Question Id : 2501071213 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A 3- ϕ , 4-wire system supplies power to a balanced star connected load. The current in each phase is 15 A. The current in the neutral wire will be

Options :

1. 15 A
2. 45 A
3. 8.66 A
4. 0 A

Question Number : 14 Question Id : 2501071214 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A star connected load has three impedances each of $(40 + j30) \Omega$ per phase. If the line current is 5 A, then the value of line voltage is _____.

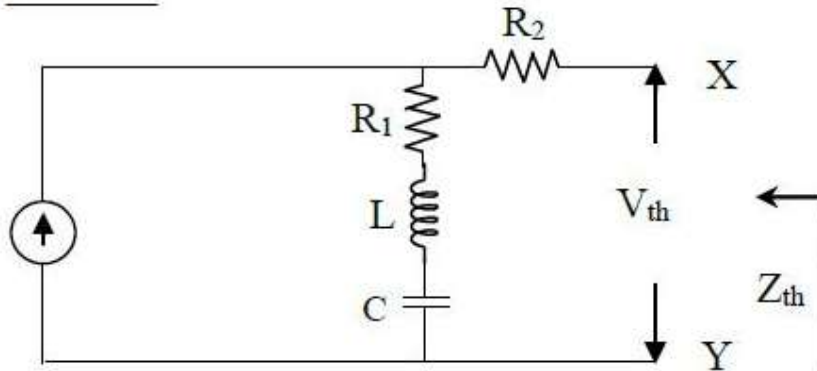
Options :

1. 250 V
2. $250/\sqrt{3}$ V
3. $250\sqrt{3}$ V

4. 200 V

Question Number : 15 Question Id : 2501071215 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In the figure shown below, the current source is $1 \angle 0^\circ$ A, $R_1=1 \Omega$ and $R_2=1 \Omega$ and the impedances of the inductor and capacitor are $2j \Omega$ and $-1j \Omega$ respectively. The V_{th} and Z_{th} of the Thevenin's equivalent of the circuit across the terminals X-Y are respectively _____.



Options :

1. $\sqrt{2} \angle 0^\circ$ V, $(2 + 2j) \Omega$
2. $2 \angle 0^\circ$ V, $(2 + 2j) \Omega$
3. $\sqrt{2} \angle 45^\circ$ V, $(2 + j) \Omega$
4. $2 \angle 45^\circ$ V, $(2 + j) \Omega$

Question Number : 16 Question Id : 2501071216 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Cascade connection of two port networks can be analyzed using _____.

Options :

1. ABCD parameters
2. Z parameters
3. Y parameters

h parameters

4.

Question Number : 17 Question Id : 2501071217 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

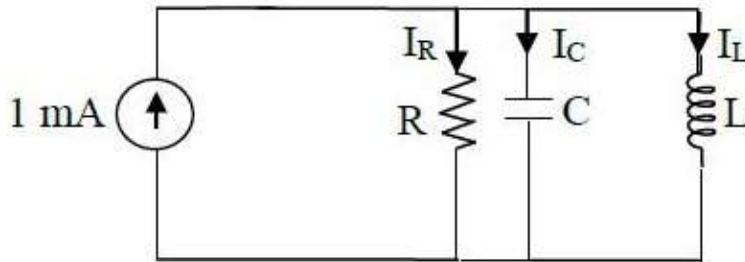
A 2- ϕ load draws phase currents of $i_1(t) = I_m \sin(\omega t - \theta_1)$, and $i_2(t) = I_m \cos(\omega t - \theta_2)$.
These currents will be balanced if θ_1 is equal to _____.

Options :

1. $-\theta_2$
2. θ_2
3. $90 - \theta_2$
4. $90 + \theta_2$

Question Number : 18 Question Id : 2501071218 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

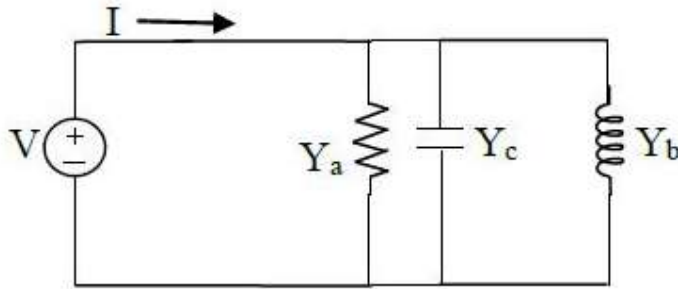
The circuit shown in the following figure is at resonant condition. Then, which one of the below statements is true?



Options :

1. $I_R > 1 \text{ mA}$
2. $I_R + I_L < 1 \text{ mA}$
3. $I_R + I_C > 1 \text{ mA}$
4. $I_L + I_C > 1 \text{ mA}$

In the figure shown below, the admittance values of the elements in Siemens are $Y_a = 1 + j1$, $Y_b = 3 + j3$, and $Y_c = -2 - j2$ respectively. If the voltage V across the elements is $10\angle 0^\circ$ V, the value of current I is _____.



Options :

1. $1.414 \angle 45^\circ$ A
2. $14.14 \angle 45^\circ$ A
3. $2.828 \angle 45^\circ$ A
4. $28.28 \angle 45^\circ$ A

Calculate the magnetic field intensity (B) at the centre of the circular conductor of radius 2 m with current 8 A.

Options :

1. $8\pi \times 10^{-7}$ T
2. $2\pi \times 10^{-7}$ T
3. $6\pi \times 10^{-7}$ T
4. $4\pi \times 10^{-7}$ T

Potential of a sphere is given by _____.

Options :

1. $Q/4\pi\epsilon_0 r$

2. $Q/\pi\epsilon_0 r$

3. $Q/4\pi\epsilon_0 r^2$

4. $Q^2/4\pi\epsilon_0 r^2$

Question Number : 22 Question Id : 2501071222 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Inside a hollow conducting sphere

Options :

1. electric field is zero.

2. electric field is non zero constant.

3. electric field changes with magnitude of the charge.

4. electric field changes with distance from the centre.

Question Number : 23 Question Id : 2501071223 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A wire 2.5 m long is bent into a square. If a current of 100 A is flowing through the wire, The magnetizing force at the centre of the square is _____.

Options :

1. 72 AT/m

2. 144 AT/m

3. 196 AT/m

4. 222 AT/m

Question Number : 24 Question Id : 2501071224 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Point charges 30 nC, -20 nC and 10 nC are located at (-1, 0, 2), (0, 0, 0) and (1, 5, -1) respectively. The total flux leaving a cube of side 6m centered at the origin is _____.

Options :

1. -20 nC

2. 10 nC

3. 20 nC

4. 30 nC

Question Number : 25 Question Id : 2501071225 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

In an electromagnetic wave, the phase difference between electric and magnetic field vectors \vec{E} and \vec{B} is

Options :

1. zero

2. $\frac{\pi}{2}$

3. π

4. $\frac{\pi}{4}$

Question Number : 26 Question Id : 2501071226 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which one of the following is a causal system?

Options :

1. $y(n) = 3x[n] - 2x[n - 1]$

2. $y(n) = 3x[n] + 2x[n + 1]$

3. $y(n) = 3x[n + 1] + 2x[n - 1]$

4. $y(n) = 3x[n + 1] 2x[n - 1] + x[n]$

Question Number : 27 Question Id : 2501071227 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Under which conditions does an initially relaxed system become unstable?

Options :

1. Only if bounded input generates bounded output

2. Only if bounded input generates unbounded output

3. Only if unbounded input generates unbounded output

4. Only if unbounded input generates bounded output

Question Number : 28 Question Id : 2501071228 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A discrete signal is said to be even symmetric, if $x(-n)$ is equal to _____.

Options :

1. $x(n)$

2. 0

3. $-x(n)$

4. $-x(-n)$

Question Number : 29 Question Id : 2501071229 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The continuous time system described by the equation $y(t) = x(t^2)$ comes under which category?

Options :

1. Causal, non-linear and time varying

2. Causal, linear and time varying

3. Non causal, non-linear and time-invariant

4. Non causal, linear and time-variant

Question Number : 30 Question Id : 2501071230 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

What does the first term ' a_0 ' in the following expression of a line spectrum indicate?

$$x(t) = a_0 + a_1 \cos w_0 t + \dots + \dots + b_1 \sin w_0 t + \dots + \dots$$

Options :

1. DC component

2. Fundamental component

3. Second harmonic component

4. Third harmonic component

Unilateral Laplace Transform is applicable for the determination of linear constant coefficients of the differential equations with _____.

Options :

1. Zero initial condition
2. Non-zero initial condition
3. Zero final condition
4. Non-zero final condition

Which property of periodic signal in Discrete Time Fourier Series (DTFS) gets completely clarified/identified by the equation $x(n - n_0)$?

Options :

1. Conjugation
2. Time Shifting
3. Frequency Shifting
4. Time Reversal

Which of the following is the one of the properties of unit impulse $\delta(t)$?

Options :

1. $\delta(at) = a \delta(t)$
2. $\delta(at) = \delta(t)$

3. $\delta(at) = 1/a \delta(t)$

4. $\delta(at) = [\delta(t)]a$

Question Number : 34 Question Id : 2501071234 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A continuous-time periodic signal $x(t)$, having a period T is convoluted with itself. Then the resulting signal is

Options :

1. not Periodic

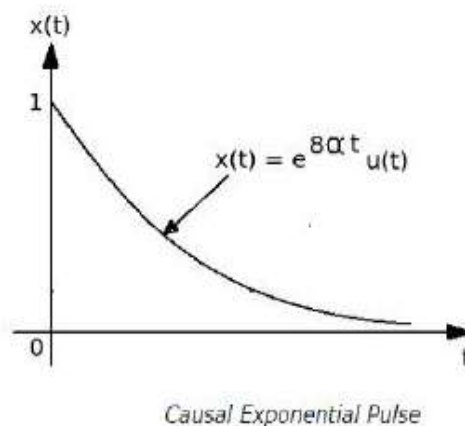
2. periodic having a period $2T$

3. periodic having a period T

4. periodic having a period $T/2$

Question Number : 35 Question Id : 2501071235 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

What would be the value of normalized energy for the causal exponential pulse shown below?



Options :

1. 8α

2. $1/8\alpha$

3. $-1/8\alpha$

4. -8α

Question Number : 36 Question Id : 2501071236 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

In an autotransformer, if the power transferred inductively is equal to the power transferred conductively, then the transformation ratio of the auto transformer is ____.

Options :

1. 1

2. 0.5

3. 2

4. 0

Question Number : 37 Question Id : 2501071237 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The number of bushings in a transformer can be reduced if _____.

Options :

1. the tappings are provided at the phase ends

2. the tappings are provided at the high voltage side

3. the tappings are provided in middle of the transformer winding

4. the tappings are provided on the low voltage side

Question Number : 38 Question Id : 2501071238 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Inter pole winding is connected in _____.

Options :

1. series with main poles
2. parallel with main poles
3. series with armature
4. parallel with armature

Question Number : 39 Question Id : 2501071239 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

In DC motors, under leading pole tips flux density will _____.

Options :

1. increase
2. decrease
3. either increase or decrease
4. remains same

Question Number : 40 Question Id : 2501071240 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A 4 pole 50 Hz induction motor is running at 1470 rpm. What is the slip value?

Options :

1. 0.2
2. 0.02
3. 0.04
4. 0.4

Quadrature axis synchronous reactance is the ratio of

Options :

1. V_{\max} to I_{\max}

2. V_{\min} to I_{\max}

3. V_{\max} to I_{\min}

4. V_{\min} to I_{\min}

Open circuit test on a transformer is performed with _____.

Options :

1. rated transformer voltage

2. rated transformer current

3. direct current

4. high frequency supply

Two transformers operating in parallel will share the load depending upon their _____.

Options :

1. ratings

2. leakage reactance

3. efficiency

4. per unit impedance

Question Number : 44 Question Id : 2501071244 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The function of a starter in a DC motor is to _____.

Options :

1. control its speed

2. increase its starting torque

3. limit the starting current to a safer value

4. reduce armature reaction effect

Question Number : 45 Question Id : 2501071245 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

In a 1- ϕ induction motor _____.

Options :

1. both the main and auxiliary windings are placed on stator

2. both the main and auxiliary windings are placed on rotor

3. main winding is placed on stator and auxiliary winding on rotor

4. auxiliary winding is placed on stator and main winding on rotor

Question Number : 46 Question Id : 2501071246 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A 3- ϕ synchronous motor has _____.

Options :

1. high starting torque
2. no starting torque
3. low starting torque
4. low starting current

Question Number : 47 Question Id : 2501071247 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The input to a stepper motor is in the form of _____.

Options :

1. frictional force
2. electric pulses
3. mechanical inertia
4. viscous damping force

Question Number : 48 Question Id : 2501071248 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A 100/10, 50 VA double winding transformer is converted to 100/110 V auto transformer. The rating of auto transformer is

Options :

1. 550 VA
2. 500 VA
3. 110 VA
4. 100 VA

A 5 kVA transformer has a turns ratio of $N_1/N_2 = 10$. The impedance of primary winding is $3 + j5 \Omega$ while that of secondary winding is $0.5 + j0.8 \Omega$. The impedance of transformer when referred to primary is _____.

Options :

1. $3.05 + j5.08 \Omega$
2. $8 + j13 \Omega$
3. $53 + j85 \Omega$
4. $3.5 + j5.8 \Omega$

In the circle diagram of an induction motor, which of the following quantity is represented by the locus of the circle?

Options :

1. Slip
2. Stator current
3. Line voltage
4. Running torque

The maximum demand on the power station is 600 MW, the annual load factor is 60%, and the capacity factor is 45%. The reserve capacity of the plant is

Options :

1. 150 MW

2. 250 MW

3. 200 MW

4. 100 MW

Question Number : 52 Question Id : 2501071252 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The sequence components of the fault current are as follows: $I_1 = j1.8$ p.u, $I_2 = -j0.7$ p.u, $I_0 = -j1.1$ p.u. The type of fault in the system is _____.

Options :

1. L-G

2. L-L

3. L-L-G

4. L-L-L

Question Number : 53 Question Id : 2501071253 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A power system has 110 buses including 20 generator buses, for the load flow analysis using Newton– Raphson method in polar coordinates, the size of the Jacobian is ____.

Options :

1. 199×199

2. 219×219

3. 129×129

$$180 \times 180$$

4.

Question Number : 54 Question Id : 2501071254 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Phenomenon of arc interruption takes place at

Options :

1. Zero voltage

2. Zero current

3. High current

4. High voltage

Question Number : 55 Question Id : 2501071255 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

An 800 kV transmission line has a maximum power transfer capacity of P. If it is operated at 400 kV with the series reactance unchanged, the new maximum power transfer capacity is approximately

Options :

1. P

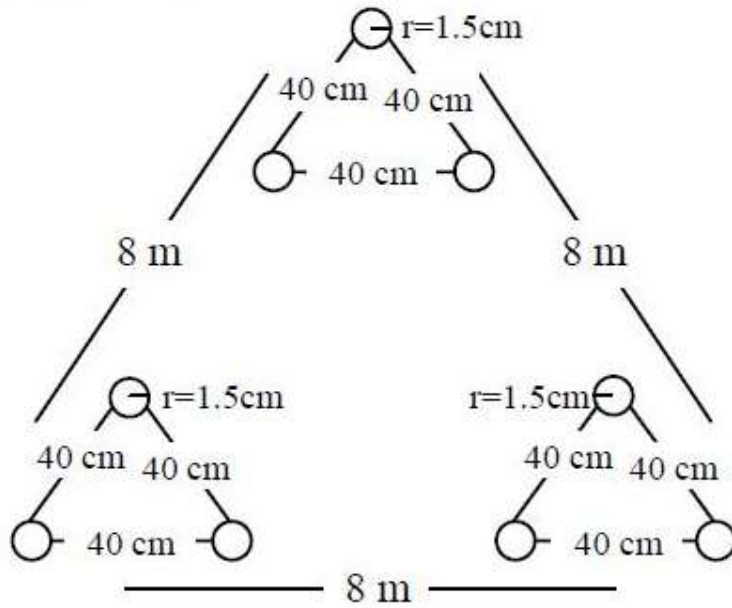
2. 2 P

3. P / 2

4. P / 4

Question Number : 56 Question Id : 2501071256 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

In a 3- ϕ system, the conductors are arranged as shown in the following figure. What are the GMD and self GMD?



Options :

1. $GMD = 8, \text{ self GMD} = \sqrt[3]{0.7788 \times 1.5 \times 40 \times 40}$

2. $GMD = 8, \text{ self GMD} = \sqrt[3]{0.7788 \times 1.5 \times 40 \times 80}$

3. $GMD = 8(2)(1/3), \text{ self GMD} = \sqrt[3]{0.7788 \times 1.5 \times 40 \times 40}$

4. $GMD = 8(2)(1/3), \text{ self GMD} = \sqrt[3]{0.7788 \times 1.5 \times 40 \times 80}$

Question Number : 57 Question Id : 2501071257 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A 400 kV AC transmission line has corona loss of 12 kW/ph/km. The corona loss in 400 kV DC line will be

Options :

1. 12

2. 48

3. 4

Question Number : 58 Question Id : 2501071258 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

In nominal- π method of solution of medium transmission lines, capacitance is assumed to be _____.

Options :

1. Distributed uniformly from sending end to receiving end
2. Divided into two halves
3. Lumped at the generation end
4. Lumped at middle of generation and load end

Question Number : 59 Question Id : 2501071259 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A short transmission line having zero resistance and total series reactance of 0.4 pu is provided with reactive power compensation at the midpoint of the line such that the midpoint voltage is held at 0.96 pu when the voltage at both the ends are 1.0 pu. What is the steady state power transmission limit of the system?

Options :

1. 9.6 pu
2. 0.0 pu
3. 4.8 pu
4. 2.4 pu

Question Number : 60 Question Id : 2501071260 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

What is the percentage voltage regulation of short transmission line, if its sending end and receiving end voltages are 160 kV and 132 kV respectively?

Options :

1. 30 %

2. 21.21 %

3. 12.12 %

4. 38.22 %

Question Number : 61 Question Id : 2501071261 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A 200 bus power system has 160 PQ buses. For achieving a load flow solution by N-R in polar coordinates, the minimum number of simultaneous equation to be solved is _____.

Options :

1. 359

2. 329

3. 360

4. 320

Question Number : 62 Question Id : 2501071262 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A 3- ϕ alternator can supply a maximum of 5000 kVA at 66 kV. The machine has internal resistance of 6%. The reactance per phase of the limiting reactor if the steady apparent power on the short circuit do not exceed 5 times full load is _____.

Options :

1. 1.22 Ω

2. 2.44 Ω

3. 5 Ω

4. 1.84Ω

Question Number : 63 Question Id : 2501071263 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Two identical synchronous machines having same inertia constant are connected in parallel and swinging together. The effective inertia constant is 4 MJ/MVA. Then each machine has inertia constant of _____.

Options :

1. 8 MJ/MVA

2. 16 MJ/MVA

3. 4 MJ/MVA

4. 2 MJ/MVA

Question Number : 64 Question Id : 2501071264 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A string insulator has 4 units. The voltage across the bottom most unit is 33.33% of the total voltage. Its string efficiency is _____.

Options :

1. 66.66%

2. 33.33%

3. 75%

4. 25%

Question Number : 65 Question Id : 2501071265 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

In a 3-core cable, the capacitance between two conductors (with sheath earthed) is $3 \mu\text{F}$. The capacitance per phase will be

Options :

1. 1.5 μF
2. 3 μF
3. 6 μF
4. 12 μF

Question Number : 66 Question Id : 2501071266 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The open-loop gain for a unity feedback system is given by $G(s) = \frac{12}{s(s+6)}$. The steady-state velocity error of the system is _____.

Options :

1. 0
2. infinite
3. 0.5
4. 2

Question Number : 67 Question Id : 2501071267 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The transfer function of a lead compensator is $\frac{1+0.15s}{1+0.05s}$. The maximum phase shift that can be obtained from this compensator is _____.

Options :

1. 60°
2. 30°

3. 45°

4. 15°

Question Number : 68 Question Id : 2501071268 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

At the gain cross over frequency $\omega = 12$ rad/s, $\angle G(j\omega)H(j\omega) = -195^\circ$. The phase margin is _____.

Options :

1. 15°

2. $+195^\circ$

3. -195°

4. -15°

Question Number : 69 Question Id : 2501071269 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The open-loop transfer function of a system is given by, $G(s)H(s) = \frac{K(s+4)}{s(s+2)}$. Its break points are _____.

Options :

1. -1.18

2. -6.82

3. -1.18 and -6.82

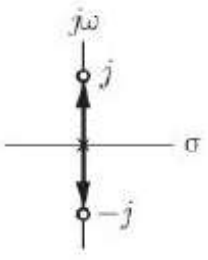
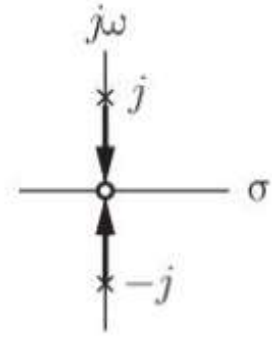
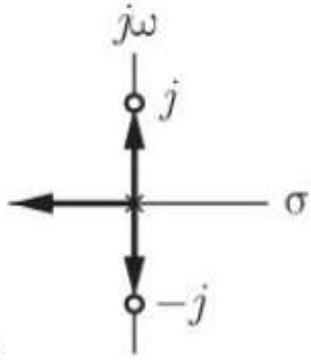
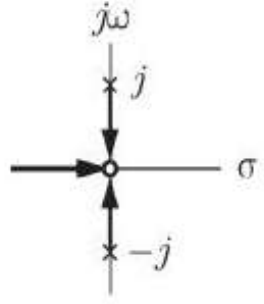
4. -1.18 and 6.82

Question Number : 70 Question Id : 2501071270 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The forward path open loop transfer function of a unity feedback system is given by

$$G(s) = \frac{K(s^2+1)}{s^2}. \text{ The root locus of this system is } \underline{\hspace{2cm}}.$$

Options :

1. 
2. 
3. 
4. 

Question Number : 71 Question Id : 2501071271 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
 Single Line Question Option : No Option Orientation : Vertical

A transfer function has two zeros at infinity. Then the relation between the numerator degree (N) and the denominator degree (M) of the transfer function is

Options :

1. $N = M + 2$

2. $N = M + 1$

3. $N = M - 2$

4. $N = M - 1$

Question Number : 72 Question Id : 2501071272 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A control system is defined by the following mathematical relationship

$$\frac{d^2y}{dt^2} + 6\frac{dy}{dt} + 5x = 12(1 - e^{-2t})$$

The response of the system as $t \rightarrow \infty$ is _____.

Options :

1. $x = 6$

2. $x = 2$

3. $x = 2.4$

4. $x = -2$

Question Number : 73 Question Id : 2501071273 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Consider the following systems

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

System 2 : $G(s) = \frac{1}{5s+1}$

The true statement regarding the systems is _____.

Options :

1. Bandwidth of system 1 is greater than the bandwidth of system 2.

2. Bandwidth of system 1 is lower than the bandwidth of system 2.

3. Bandwidth of both the systems are the same.

4. Bandwidth of both systems are infinite.

Question Number : 74 Question Id : 2501071274 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The response $h(t)$ of a linear time invariant system to an impulse $\delta(t)$, under initially relaxed condition is $h(t) = e^{-t} + e^{-2t}$. The response of this system for a unit step input $u(t)$ is _____.

Options :

1. $u(t) + e^{-t} + e^{-2t}$

2. $(e^{-t} + e^{-2t})u(t)$

3. $(1.5 - e^{-t} - 0.5e^{-2t})u(t)$

4. $e^{-t}\delta(t) + e^{-2t}u(t)$

Question Number : 75 Question Id : 2501071275 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If the unit step response of a network is $(1 - e^{-at})$, then its unit impulse response will be _____.

Options :

1. ae^{-at}

2. $ae^{-1/a}$

3. $\frac{1}{a}e^{-at}$

4. $(1 - a)e^{-at}$

Question Number : 76 Question Id : 2501071276 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which time is responsible for introducing an error in the temperature regulation of applications associated with ON-OFF controllers?

Options :

1. Rise time

2. Dead time

3. Switching time

4. Decay time

Question Number : 77 Question Id : 2501071277 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Root locus of $s(s + 2) + K(s + 4) = 0$ is a circle. What are the coordinates of the center of this circle?

Options :

1. $-2, 0$

2. $-3, 0$

3. $-4, 0$

4. $-5, 0$

Question Number : 78 Question Id : 2501071278 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If the poles of a system lie on the imaginary axis, the system will be _____.

Options :

1. stable

2. conditionally stable
3. marginally stable
4. unstable

Question Number : 79 Question Id : 2501071279 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A phase lag compensation will _____.

Options :

1. improve relative stability
2. increase the speed of response
3. increase bandwidth
4. increase overshoot

Question Number : 80 Question Id : 2501071280 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The open-loop transfer function of a feedback control system is given by $\frac{K}{s^2 + 3s + 6}$.

The break-away point(s) of its root locus plot are _____.

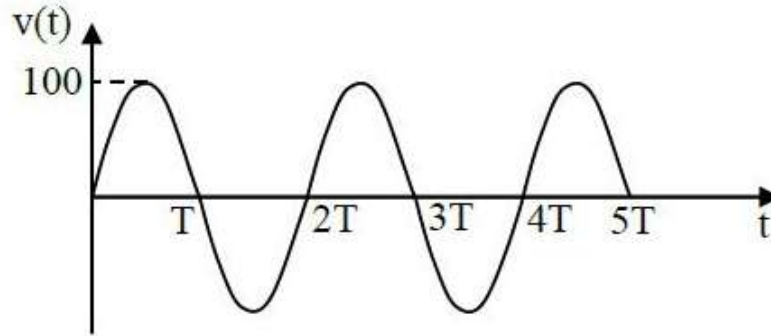
Options :

1. exist at $(-1 \pm j)$
2. exist at $(-\frac{3}{2} \pm j\sqrt{\frac{15}{16}})$
3. exist at origin

4. do not exist

Question Number : 81 Question Id : 2501071281 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The sine voltage wave form shown in the figure is fed to a moving iron voltmeter. Its reading would be close to _____.



Options :

1. 0
2. $(2 \times 100)/\pi$
3. $100/\pi$
4. $100/\sqrt{2}$

Question Number : 82 Question Id : 2501071282 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A PMMC instrument has full scale deflection of $100 \mu\text{A}$ and a coil resistance of $1 \text{ k}\Omega$. To convert the instrument into an ammeter with full scale deflection of 1 A , the required shunt resistance is _____.

Options :

1. 0.1Ω
2. 1Ω

3. 0.11Ω

4. 0.10001Ω

Question Number : 83 Question Id : 2501071283 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

In the process of taking measurements using a Q-meter, high impedance elements should preferably be connected in _____.

Options :

1. Star

2. Delta

3. Series

4. Parallel

Question Number : 84 Question Id : 2501071284 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

An Ammeter is convertible to a voltmeter by

Options :

1. Changing the scale

2. Putting a large resistance in parallel with the actual measuring part of the instrument

3. Putting a large resistance in series with the actual measuring part of the instrument

4. Simply installing the instrument in parallel with the circuit

The material most preferred for control spring is _____.

Options :

1. German silver
2. Platinum silver
3. Silicon bronze
4. Phosphor bronze

The error which does not result in moving iron instruments for both AC and DC measurements is _____.

Options :

1. Stray magnetic field error
2. hysteresis error
3. eddy current error
4. temperature error

Megger is an instrument used for the measurement of _____.

Options :

1. High resistance and insulation resistance

2. Medium resistance

3. Low resistance

4. Leakage current

Question Number : 88 Question Id : 2501071288 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Phantom loading for testing of energy meter is used _____.

Options :

1. to isolate the current and potential circuit

2. to reduce power loss during testing

3. for meter power loss during testing

4. to test meter having a large current rating for which loads may not be available

Question Number : 89 Question Id : 2501071289 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The main advantage of Anderson bridge over Maxwell bridge is _____.

Options :

1. reduction of the cost

2. balance equation independent of frequency

3. attaining balance condition is easier

4. measures high Q inductors

Question Number : 90 Question Id : 2501071290 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Relative permittivity can be measured using _____ bridge.

Options :

1. Wheatstone's
2. Hays
3. Desauty's
4. Schering

Question Number : 91 Question Id : 2501071291 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

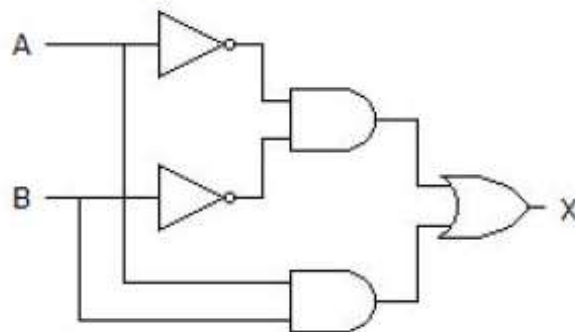
Bandwidth of an amplifier is _____.

Options :

1. difference between upper cut-off frequency and lower cut-off frequency
2. sum of upper cut-off frequency and lower cut-off frequency
3. average of upper cut-off frequency and lower cut-off frequency
4. independent to cut off frequencies

Question Number : 92 Question Id : 2501071292 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following logic expressions represents the logic diagram shown?



Options :

1. $X = AB' + A'B$
2. $X = (AB)' + AB$
3. $X = (AB)' + A'B'$
4. $X = A'B' + AB$

Question Number : 93 Question Id : 2501071293 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The flash type A/D converters are called as

Options :

1. Parallel non-inverting A/D converter
2. Parallel counter A/D converter
3. Parallel inverting A/D converter
4. Parallel comparator A/D converter

Question Number : 94 Question Id : 2501071294 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following represents the time taken by the 8085 microprocessor to fetch and execute an instruction?

Options :

1. Clock cycle
2. Memory cycle
3. Machine cycle
4. Instruction cycle

In a power transistor, _____ is the controlling parameter.

Options :

1. V_{BE}

2. V_{CE}

3. I_B

4. I_C

A 1- ϕ half wave diode rectifier with R load, has input voltage of 240 V. The input power factor is

Options :

1. Unity

2. 0.707 lag

3. 0.56 lag

4. 0.865 lag

NAND and NOR gates are called

Options :

1. bidirectional gates

2. unilateral gates

3. universal gates

4. high level logic gates

Question Number : 98 Question Id : 2501071298 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of these is the memory element used in a clocked sequential circuit?

Options :

1. Flip-flop

2. Gate

3. Static RAM

4. ROM

Question Number : 99 Question Id : 2501071299 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If a JK flip-flop is clocked at 10 kHz while $J = 1$ and $K = 1$, what will be its output frequency?

Options :

1. 0 kHz

2. 5 kHz

3. 10 kHz

4. 20 kHz

Question Number : 100 Question Id : 2501071300 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A differential amplifier has a differential gain of 20,000. Common mode rejection ratio (CMRR) is 80 db. The Common mode gain is given by

Options :

1. 2
2. 1
3. 0.5
4. 0

Question Number : 101 Question Id : 2501071301 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

An amplifier without feedback has a gain of 1000. The gain with a negative feedback of 0.009 is

Options :

1. 100
2. 10
3. 900
4. 125

Question Number : 102 Question Id : 2501071302 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A CE amplifier has $R_L=10\text{ k}\Omega$. Given $h_{ie}=1\text{ k}\Omega$, $h_{fe}=50$, $h_{re}=0$ and $1/h_{oe}=40\text{ k}\Omega$.
What is the voltage gain?

Options :

1. -500
2. -400

3. -50

4. -40

Question Number : 103 Question Id : 2501071303 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The input impedance of a good operational amplifier (Op-amp) is expected to be of the order of

Options :

1. a few ohms

2. 1 K Ω

3. 10 K Ω

4. more than 100 K Ω

Question Number : 104 Question Id : 2501071304 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The multivibrator circuit which possesses one stable state and one quasi stable state is _____.

Options :

1. astable

2. monostable

3. bistable

4. schmitt trigger circuit

Question Number : 105 Question Id : 2501071305 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The filter which exhibits AC equiripple in the passband and monotonic characteristic in stop band is _____.

Options :

1. Butterworth
2. Chebyshev
3. Bessel
4. Elliptic

Question Number : 106 Question Id : 2501071306 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A thyristor is in the forward blocking state. Then

Options :

1. all the three junctions are reverse biased
2. the anode and cathode junctions are forward biased but the gate junction is reverse biased
3. the anode junction is forward biased but the other two, cathode and gate junctions are reverse biased
4. the anode and gate junctions are forward biased but the cathode junction is reverse biased

Question Number : 107 Question Id : 2501071307 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A 3- ϕ circulating current dual converter is supplying a RL load. If the triggering angle of one converter is 60° , then the other converter operates at a triggering angle of _____.

Options :

1. 30°
2. 60°

3. 120°

4. 150°

Question Number : 108 Question Id : 2501071308 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Given that V_m is the maximum value of the input phase voltage. The maximum value of the average output voltage for three-phase, six-pulse, fully controlled rectifier is _____.

Options :

1. $\frac{3V_m}{\pi} \cos\alpha$

2. $\frac{3\sqrt{3}V_m}{\pi} \cos\alpha$

3. $\frac{3\sqrt{3}V_m}{\pi}$

4. $\frac{3V_m}{\pi}$

Question Number : 109 Question Id : 2501071309 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

In a 3- ϕ semi-converter, if the firing angle is less than or equal to 60° , then the duration of conduction of each thyristor and diode would be respectively _____.

Options :

1. 60° and 60°

2. 60° and 90°

3. 120° and 120°

180° and 180°

4.

Question Number : 110 Question Id : 2501071310 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A gate-turn-off thyristor _____.

Options :

1. requires a special turn-off circuit like a thyristor
2. can be turned off by removing the gate pulse
3. can be turned off by a negative current pulse at the gate
4. can be turned off by a positive current pulse at the gate

Question Number : 111 Question Id : 2501071311 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A 1- ϕ full bridge inverter is connected to a load of 24 Ω . The DC input voltage is 48 V. What is the r.m.s. output voltage at fundamental frequency?

Options :

1. $\frac{4 \times 48}{\sqrt{2\pi}}$ V
2. $\frac{2 \times 48}{\sqrt{2\pi}}$ V
3. $\frac{4 \times 48}{2\pi}$ V
4. $\frac{2 \times 48}{2\pi}$ V

Question Number : 112 Question Id : 2501071312 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

In a 1- ϕ bridge inverter, the maximum value of fundamental component of load current is I. For a load which is highly non inductive in nature, the maximum value of n^{th} harmonic component of load current will be _____.

Options :

1. $\frac{I}{n}$

2. $\frac{I}{n\sqrt{n}}$

3. $\frac{I}{n^2}$

4. I

Question Number : 113 Question Id : 2501071313 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

An ideal chopper is operating at a frequency of 500 Hz from 60 V battery input. It is supplying a load having 3 Ω resistance and 9mH inductance. Assuming the load is shunted by a perfect commutating diode and battery is loss less, what is the mean load current at an on/off ratio of 1/1?

Options :

1. 10 A

2. 15 A

3. 20 A

4. 25 A

Question Number : 114 Question Id : 2501071314 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

For a 3- ϕ full converter, the ratio of average voltage to maximum line voltage is

Options :

1. $0.9549 \cos\alpha$

2. $0.9549 \sin\alpha$

3. $0.4775 \cos\alpha$

4. $0.9549(1 + \cos\alpha)$

Question Number : 115 Question Id : 2501071315 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A 1- ϕ full bridge inverter can be operated in load commutation mode, If the load consists of _____.

Options :

1. RL

2. RLC underdamped

3. RLC overdamped

4. RLC critically damped

Question Number : 116 Question Id : 2501071316 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The torque produced by a 1- ϕ induction motor fed through an AC voltage controller for speed control is due to _____.

Options :

1. fundamental component of current as well as harmonics, both odd and even

2. fundamental component of current and even harmonic currents

3. fundamental component of current and odd harmonic currents

4. fundamental component of current alone

Question Number : 117 Question Id : 2501071317 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

An elevator drive is required to operate in

Options :

1. one quadrant only
2. two quadrants
3. three quadrants
4. four quadrants

Question Number : 118 Question Id : 2501071318 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A four quadrant operation requires

Options :

1. two full converters in series
2. two full converters connected in parallel
3. two full converter connected in back to back
4. two semi converter connected in back to back

Question Number : 119 Question Id : 2501071319 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The air resistance to the movement of the train is proportional to _____.

Options :

1. speed

2. speed^2

3. $1/\text{speed}$

4. $1/\text{speed}^2$

Question Number : 120 Question Id : 2501071320 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

For running at half of the maximum speed, the batteries of battery electric drive are connected in _____.

Options :

1. parallel

2. series

3. series - parallel

4. drive cannot run at this speed