

## Question Paper Preview

**Notations :**

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

<b>Question Paper Name:</b>	Electrical Engineering 30th May 2018 Shift2
<b>Subject Name:</b>	Electrical Engineering
<b>Creation Date:</b>	2018-05-30 17:02:00
<b>Duration:</b>	120
<b>Total Marks:</b>	120
<b>Display Marks:</b>	No
<b>Calculator:</b>	None
<b>Magnifying Glass Required?:</b>	No
<b>Ruler Required?:</b>	No
<b>Eraser Required?:</b>	No
<b>Scratch Pad Required?:</b>	No
<b>Rough Sketch/Notepad Required?:</b>	No
<b>Protractor Required?:</b>	No

<b>Display Number Panel:</b>	Yes
<b>Group All Questions:</b>	No

Question Number : 1 Question Id : 5113468641 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $A = \begin{bmatrix} 2 & 0 & 6 \\ 4 & 5 & 0 \\ 1 & 5 & k \end{bmatrix}$  is a singular matrix then the value of  $k =$

**Options :**

1. ✗ 5
2. ✗ -7
3. ✓ -9
4. ✗ 10

Question Number : 2 Question Id : 5113468642 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $A = \begin{bmatrix} -1 & 2 & -2 \\ 1 & 2 & 1 \\ -1 & -1 & 0 \end{bmatrix}$  then the characteristic polynomial of A is

Options :

1. ✓  $\lambda^3 - \lambda^2 - 5\lambda + 5$
2. ✗  $\lambda^3 - \lambda^2 + 5\lambda + 5$
3. ✗  $\lambda^3 + \lambda^2 - 5\lambda - 5$
4. ✗  $\lambda^3 - \lambda^2 + 5\lambda + 5$

Question Number : 3 Question Id : 5113468643 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $I = \int_0^{\frac{\pi}{2}} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}} dx$  then the value of I is

Options :

1. ✗  $\frac{\pi}{8}$
2. ✗  $\frac{\pi}{6}$
3. ✗  $\frac{\pi}{5}$
4. ✓  $\frac{\pi}{4}$

Question Number : 4 Question Id : 5113468644 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $f(x) = x^2 - 6x + 8$  satisfies all the conditions of Rolle's mean value theorem  $[2, 4]$ , then 'c' of the mean value theorem

Options :

1. ✗ 6
2. ✓ 3
3. ✗ 4

4. ✖ 5

Question Number : 5 Question Id : 5113468645 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The unit vector normal to  $x^2 - y^2 + z = 2$  at the point  $(1, -1, 2)$  is

Options :

1. ✔  $\frac{2i+2j+z}{3}$

2. ✖  $\frac{2i+2j-z}{3}$

3. ✖  $\frac{2i+j+z}{3}$

4. ✖  $\frac{i+2j+z}{3}$

Question Number : 6 Question Id : 5113468646 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $\phi = xyz$  the directional derivative of  $\phi$  in the direction of  $i$  is

Options :

1. ✖ 0(zero)

2. ✔ 1

3. ✖ 2

4. ✖ -1

Question Number : 7 Question Id : 5113468647 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The solution of  $x dy - y dx = \lambda (x^2 + y^2) dy$  is

Options :

1. ✔  $\tan^{-1} \frac{y}{x} = \lambda y + c$

2. ✖  $\tan^{-1} \frac{x}{y} = \lambda x + c$

3. ✘  $\sin^{-1}\frac{y}{x} = \lambda y + c$

4. ✘  $\cos^{-1}\frac{y}{x} = \lambda y + c$

Question Number : 8 Question Id : 5113468648 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The Particular integral of  $(D^3 - 4D^2)y = 8$  is

Options :

1. ✘  $x^2$

2. ✔  $-x^2$

3. ✘  $x^{-2}$

4. ✘  $x^3$

Question Number : 9 Question Id : 5113468649 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $L[f(t)]$  denotes the Laplace transform of  $f(t)$ , then  $L[t \sin 2t] =$

Options :

1. ✔  $\frac{4}{(s^2+4)^2}$

2. ✘  $\frac{4s}{(s^2-4)^2}$

3. ✘  $\frac{4s}{(s^2+4s)^2}$

4. ✘  $\frac{4s}{(s^2+4)^2}$

Question Number : 10 Question Id : 5113468650 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $C$  is a circle given by  $|z|=2$  and  $f(z) = \frac{z-2}{z(z-1)}$  then the value of  $\text{Res}[f(z)]_{z=1}$

Options :

1. ✘ 2

2. ✘ - 2

3. ✘ 1

4. ✔ -1

Display Number Panel:

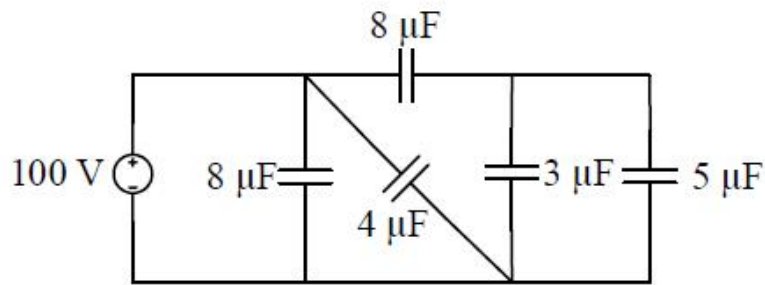
Yes

Group All Questions:

No

Question Number : 11 Question Id : 5113468651 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Find the charging time to charge the capacitances shown in below figure, by steady direct current of constant magnitude of 10 A.



Options :

1. ✘ 100 μS

2. ✘ 28 μS

3. ✔ 160 μS

4. ✘ 280 μS

Question Number : 12 Question Id : 5113468652 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

What is the energy supplied by the unit impulse source, when it is applied to an inductor of value 1H

Options :

1. ✘ ∞

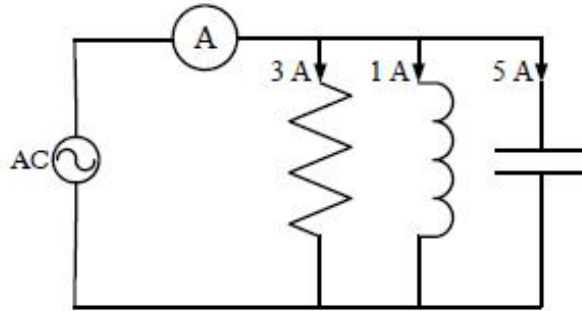
2. ✘ 1 J

3. ✓ 0.5 J

4. ✗ 0 J

Question Number : 13 Question Id : 5113468653 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The current read by the ammeter A in the circuit shown in the figure is



Options :

1. ✗ 9 A

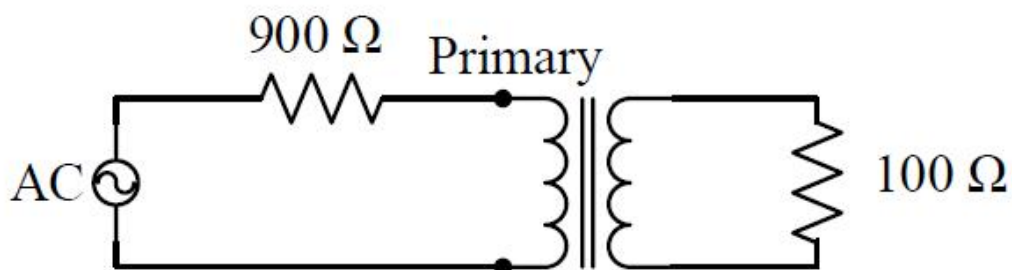
2. ✓ 5 A

3. ✗ 3 A

4. ✗ 1 A

Question Number : 14 Question Id : 5113468654 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Consider the circuit shown in the given figure. For maximum power transfer to the load, the primary to secondary turns ratio must be



Options :

1. ✗ 9:1

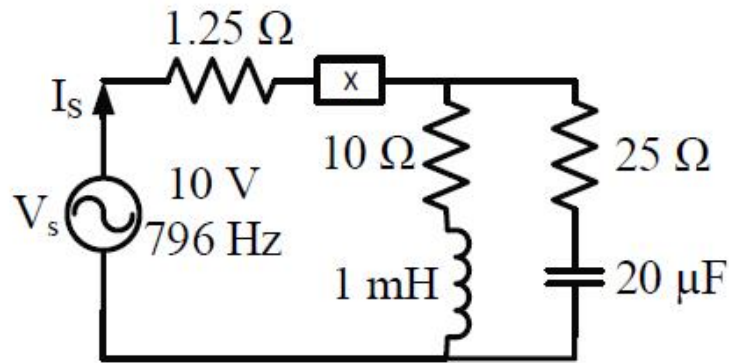
2. ✗ 3:1

3. ✓ 1:3

4. ✗ 1:9

Question Number : 15 Question Id : 5113468655 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Determine the source current ( $I_s$ ) given in the below circuit, when the value of 'X' puts the source current in phase with the source voltage ( $V_s$ ).



Options :

1. ✗ 0.95 A

2. ✓ 1.05 A

3. ✗ 0.85 A

4. ✗ 1.15 A

Question Number : 16 Question Id : 5113468656 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The current through the current coil of a wattmeter is given by  $i = (1 + 2 \sin \omega t)$  A and the voltage across the pressure coil is  $v = (2 + 3 \sin 2 \omega t)$  V. The wattmeter will read

Options :

1. ✗ 8 W

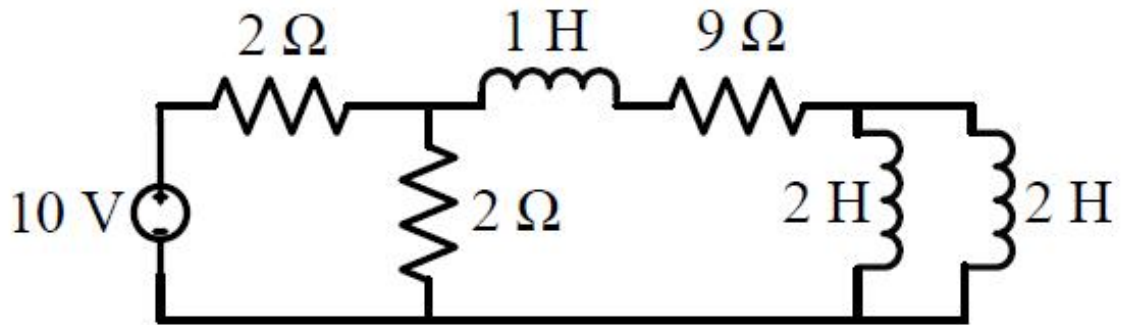
2. ✗ 5.05 W

3. ✓ 2 W

4. ✗ 1 W

Question Number : 17 Question Id : 5113468657 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The time constant of the given network is



Options :

1. ✘ 1 S

2. ✔ 0.5 S

3. ✘ 2 S

4. ✘ 5 S

Question Number : 18 Question Id : 5113468658 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

An ideal transformer has turns ratio of 2:1. Considering high voltage side as port 1 and low voltage side as port 2, the transmission line parameters of the transformer will be

Options :

1. ✘  $\begin{bmatrix} 0 & -2 \\ 0.5 & 0 \end{bmatrix}$

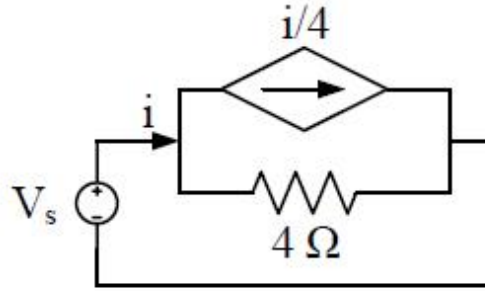
2. ✘  $\begin{bmatrix} -2 & 0 \\ 0 & -0.5 \end{bmatrix}$

3. ✔  $\begin{bmatrix} 2 & 0 \\ 0 & 0.5 \end{bmatrix}$

4. ✘  $\begin{bmatrix} 0.5 & 0 \\ 0 & 2 \end{bmatrix}$

Question Number : 19 Question Id : 5113468659 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The network shown in the below figure, the effective resistance faced by the voltage source is,



Options :

1. ✘  $4\ \Omega$
2. ✔  $3\ \Omega$
3. ✘  $5\ \Omega$
4. ✘  $10\ \Omega$

Question Number : 20 Question Id : 5113468660 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

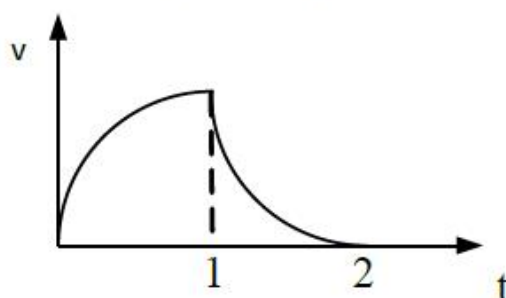
The number of  $2\ \mu\text{F}$ ,  $400\ \text{V}$  capacitors needed to obtain a capacitance value of  $1.5\ \mu\text{F}$  rated for  $1600\ \text{V}$  is

Options :

1. ✔ 12
2. ✘ 8
3. ✘ 6
4. ✘ 4

Question Number : 21 Question Id : 5113468661 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A voltage wave is shown in below figure, where  $v = 100(1 - e^{-10t})$  for  $0 < t < 1$  and  $v = 100e^{-10t}$  for  $1 < t < 2$ . Find the RMS value of the voltage wave up to  $t = 2$ .



Options :

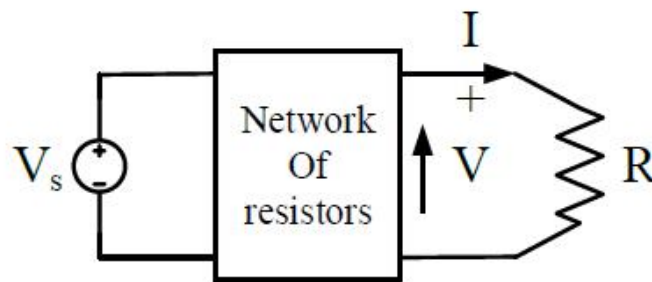
1. ✘ 100 V
2. ✔ 65.25 V
3. ✘ 125.5 V
4. ✘ 85 V

Question Number : 22 Question Id : 5113468662 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A two port network has been shown in below figure, where the block represents a network of resistors. A resistance is connected at the output. The given conditions of the network are

- i. When  $R = \infty, V = 10 \text{ V}$
- ii. When  $R = 0, I = 5 \text{ A}$

Find the new value of  $V$  when  $R = 8 \Omega$ .



Options :

1. ✘ 10 V
2. ✘ 5 V
3. ✔ 8 V
4. ✘ 15 V

Question Number : 23 Question Id : 5113468663 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Three resistors of value  $2 \text{ K}\Omega$ ,  $5 \text{ K}\Omega$  and  $10 \text{ K}\Omega$  are connected in series and a  $20 \text{ V}$  dc supply is applied across the series combination. A voltmeter of internal resistance  $10 \text{ K}\Omega$  reads  $V_1$  volts across the  $5 \text{ K}\Omega$  resistor and  $V_2$  across the  $10 \text{ K}\Omega$  resistor. Which of the following statements is true?

Options :

1. ✘  $V_1 = 2V_2$

2. ✘  $V_1 = \frac{V_2}{2}$

3. ✘  $V_1 < \frac{V_2}{2}$

4. ✔  $V_1 > \frac{V_2}{2}$

Question Number : 24 Question Id : 5113468664 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Two infinite parallel planes carry equal but opposite uniform charge densities,  $\sigma$  coulomb/m<sup>2</sup> on  $y = 0$  plane and  $-\sigma$  coulomb/m<sup>2</sup> on  $y = 3$  plane. Then, the Electric field on the  $y$ -axis at  $y = 1.5$  m is

Options :

1. ✘  $\vec{E} = -\frac{\sigma}{\epsilon_0} \hat{y}$

2. ✔  $\vec{E} = \frac{\sigma}{\epsilon_0} \hat{y}$

3. ✘  $\vec{E} = -\frac{\sigma}{3\epsilon_0} \hat{y}$

4. ✘  $\vec{E} = \frac{\sigma}{3\epsilon_0} \hat{x}$

Question Number : 25 Question Id : 5113468665 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If a uniformly charged spherical shell whose radius is  $R$  and whose total charge is  $q$ , then the potential at  $\frac{R}{2}$ , is \_\_\_\_\_. Use infinity as reference.

Options :

1. ✘  $V = \frac{q}{2\pi\epsilon_0 R}$

2. ✘  $V = 0$

3. ✔  $V = \frac{q}{4\pi\epsilon_0 R}$

4. ✘  $V = \infty$

Question Number : 26 Question Id : 5113468666 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If a Gaussian surface of radius is  $R$  is enclosed by  $-2q$  at centre and  $q$  at  $\frac{R}{2}$ , then the surface integral of the Electric fields produced by these charges over the Gaussian surface is

Options :

1. ✘  $q$
2. ✘  $-q$
3. ✘  $\frac{q}{\epsilon_0}$
4. ✔  $-\frac{q}{\epsilon_0}$

Question Number : 27 Question Id : 5113468667 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The capacitance per unit length of two coaxial metal cylindrical tubes of radii  $a$  and  $b$  is... ( $a > b$ , and  $V(b)$  is at higher potential)

Options :

1. ✘  $\frac{2\pi\epsilon_0}{\ln\left(\frac{b}{a}\right)}$
2. ✔  $\frac{2\pi\epsilon_0}{\ln\left(\frac{a}{b}\right)}$
3. ✘  $\frac{4\pi\epsilon_0}{\ln\left(\frac{b}{a}\right)}$
4. ✘  $\frac{4\pi\epsilon_0}{\ln\left(\frac{a}{b}\right)}$

Question Number : 28 Question Id : 5113468668 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The magneto static field is produced due to

Options :

1. ✘ stationary charges only
2. ✘ charges are moving with variable velocity only

3. ✓ steady currents only

4. ✗ moving charges of variable velocity ad steady currents

Question Number : 29 Question Id : 5113468669 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The magnetic field on the  $x > 0$  due to an infinite uniform surface current  $\vec{K} = -k \hat{z}$ , flowing over the  $y - z$  plane (i.e.,  $x = 0$  plane) is

Options :

1. ✗  $\vec{B} = \frac{\mu_0}{2} k \hat{x}$

2. ✓  $\vec{B} = \frac{\mu_0}{2} k \hat{y}$

3. ✗  $\vec{B} = -\frac{\mu_0}{2} k \hat{y}$

4. ✗  $\vec{B} = -\frac{\mu_0}{2} k \hat{x}$

Question Number : 30 Question Id : 5113468670 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The self inductance per unit length of long solenoid, of radius  $R$ , carrying  $n$  turns per unit length is

Options :

1. ✗  $L = \mu_0 n \pi R^2$

2. ✗  $L = 2\mu_0 n \pi R^2$

3. ✓  $L = \mu_0 n^2 \pi R^2$

4. ✗  $L = 2\mu_0 n^2 \pi R^2$

Question Number : 31 Question Id : 5113468671 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Step response of a first order system is

Options :

1. ✓ exponential

2. ✗ linear

3. ✘ triangular

4. ✘ sinusoidal

Question Number : 32 Question Id : 5113468672 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The input signal for frequency response analysis of a linear time invariant system is

Options :

1. ✘ step input

2. ✔ sinusoidal input

3. ✘ triangular input

4. ✘ impulse

Question Number : 33 Question Id : 5113468673 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The dc gain of  $G(s) = 12/(s+2)(s+3)$  is

Options :

1. ✔ 2

2. ✘ 12

3. ✘ 6

4. ✘ 1

Question Number : 34 Question Id : 5113468674 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

An impulse is applied to a system whose time response is  $e^{-t}$ . The transfer function is

Options :

1. ✘  $1/s$

2. ✔  $1/(1+s)$

3. ✘  $1/(1-s)$

4. ✘  $s/(1+s)$

Question Number : 35 Question Id : 5113468675 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

An RC series circuit with the output voltage taken across the capacitor is a

Options :

1. ✔ lag compensator
2. ✘ lead compensator
3. ✘ lag-lead compensator
4. ✘ proportional controller

Question Number : 36 Question Id : 5113468676 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Error series gives the value of

Options :

1. ✘ steady state error
2. ✘ error constants
3. ✔ time variation of error
4. ✘ overshoot

Question Number : 37 Question Id : 5113468677 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Phase margin is calculated at

Options :

1. ✔ gain cross-over frequency
2. ✘ phase cross-over frequency
3. ✘ resonant frequency
4. ✘ any frequency

Question Number : 38 Question Id : 5113468678 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

For under damped situation,

Options :

1. ✘ phase changes gradually at resonant frequency
2. ✘ phase remains constant around resonant frequency
3. ✔ phase changes abruptly at resonant frequency
4. ✘ phase is constant at all frequencies

Question Number : 39 Question Id : 5113468679 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

PI controller is a

Options :

1. ✘ lead compensator
2. ✔ lag compensator
3. ✘ lag-lead compensator
4. ✘ high pass filter

Question Number : 40 Question Id : 5113468680 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Lyapunov's stability criterion is used for

Options :

1. ✘ linear systems only
2. ✘ non-linear systems only
3. ✔ linear and non linear systems
4. ✘ time varying systems only

Question Number : 41 Question Id : 5113468681 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

For the system given by  $\frac{dx_1}{dt} = x_1 + x_2 + u$ ,  $\frac{dx_2}{dt} = -2x_1 - x_2 + u$ , and  $y = x_1$

Options :

1. ✓ is observable
2. ✗ not observable
3. ✗ observability is uncertain
4. ✗ observability can't be decided

Question Number : 42 Question Id : 5113468682 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Expression for transfer function in state space representation is given by

Options :

1. ✗  $C(SI - A)^{-1}$
2. ✗  $(SI - A)^{-1}$
3. ✓  $C(SI - A)^{-1}B$
4. ✗  $(SI - A)^{-1}B$

Question Number : 43 Question Id : 5113468683 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $\Phi(t)$  is the state transition matrix, then which of the following is correct?

Options :

1. ✗  $\Phi(0) = I$
2. ✗  $\Phi^{-1}(t) = \Phi(-t)$
3. ✗  $[\Phi(t)]^K = \Phi(Kt)$
4. ✓  $\Phi^{-1}(t) = \Phi(t)$

Question Number : 44 Question Id : 5113468684 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Phase shift due to pole at origin is

Options :

1. ✓  $-90^0$  irrespective of frequency
2. ✗ varies linearly from  $0^0$  to  $90^0$
3. ✗ varies linearly from  $0^0$  to  $-90^0$
4. ✗  $+90^0$  irrespective of frequency

Question Number : 45 Question Id : 5113468685 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

For a unity feedback second order system, percentage overshoot is

Options :

1. ✗  $\exp(-\zeta)$
2. ✓  $\exp(-\zeta\pi/\sqrt{1-\zeta^2})$
3. ✗  $\exp(\zeta\pi/\sqrt{1-\zeta^2})$
4. ✗  $\exp(1/\sqrt{1-\zeta^2})$

Question Number : 46 Question Id : 5113468686 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A transmission line has a reactance of 1 pu is operating at  $V_s = V_r = 1$  pu. The generator is connected at source end which is delivering 0.5 pu of active power and the transmission line is compensated with a series capacitance of 0.5 pu. Find the load angle with series capacitance compensation?

Options :

1. ✓  $14.5^\circ$
2. ✗  $29^\circ$
3. ✗  $35.5^\circ$
4. ✗  $10.5^\circ$

Question Number : 47 Question Id : 5113468687 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Specified quantities of Load bus are

Options :

1. ✓ P and Q

2. ✗ V and  $\delta$

3. ✗ P and  $\delta$

4. ✗ P and V

Question Number : 48 Question Id : 5113468688 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Range of accelerating factor is

Options :

1. ✗ 50 to 100

2. ✗ 1 to 10

3. ✓ 1.4 to 1.8

4. ✗ 10.8 to 11.2

Question Number : 49 Question Id : 5113468689 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

For n bus power system, size of Y bus matrix is

Options :

1. ✓  $(n-1) \times (n-1)$

2. ✗  $(n-2) \times (n-2)$

3. ✗  $n \times n$

4. ✗  $(n-1) \times (n-2)$

Question Number : 50 Question Id : 5113468690 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

With same maximum voltage to earth, which ac system (with p.f. 0.8) will require more copper as compared to dc 2 wire system

Options :

1. ✘ single phase. 2 wire (mid point earthed)
2. ✘ single phase. 3 wire (neutral=1/2 outer)
3. ✘ three phase three wire
4. ✔ three phase-four wire (neutral = outer)

Question Number : 51 Question Id : 5113468691 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Corona usually occurs when the electrostatic stress in the air around the conductor succeeds

Options :

1. ✔ 30 kV (maximum value)/cm
2. ✘ 22 kV (maximum value)/cm
3. ✘ 11 kV (rms value)/cm
4. ✘ 6.6 kv (rms value)/cm

Question Number : 52 Question Id : 5113468692 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The inductance of a single phase two wire line is given by ( $D$  is the distance between conductors and  $2r$  is the diameter of conductor)

Options :

1. ✔  $0.4 \log_e (D/r)$  mH/km
2. ✘  $0.55 \log_e (D/r)$  mH/km
3. ✘  $0.4 \log_e (r/D)$  mH/km
4. ✘  $0.55 \log_e (r/D)$  mH/km

Question Number : 53 Question Id : 5113468693 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

For high voltage, ac circuit breakers, the rated short circuit current is passed for

Options :

1. ✘ 0.01 sec
2. ✘ 0.1 sec
3. ✔ 3 seconds
4. ✘ 30 seconds

Question Number : 54 Question Id : 5113468694 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In a vacuum circuit breaker, the vacuum is of the order of

Options :

1. ✘ 10mm Hg
2. ✘  $10^{-2}$ mmHg
3. ✘  $10^{-6}$  mmHg
4. ✔  $10^{-9}$ mmHg

Question Number : 55 Question Id : 5113468695 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Power generation equipment in a thermal power plant costs Rs.15,75,000 and has a useful life of 25 years.

If the salvage value of the plant be Rs.75,000 and the rate of annual compound interest be 5% the amount of annual installment by straight line method in Rs. will be

Options :

1. ✘ 30,000
2. ✔ 60,000
3. ✘ 60,500
4. ✘ 60,750

Question Number : 56 Question Id : 5113468696 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Two steam turbines each of 20,000 kW capacity drive a total load of 30,000 kW. The steam rates in kilogram per hour are

$$T_{P1} = 2000 + 10 P_1 - 0.0001 P_1^2 \quad \text{and} \quad T_{P2} = 2000 + 10 P_2 - 0.0001 P_2^2$$

The best division of the load will be

Options :

1. ✓  $T_{P1} = 20,000$  kW,  $T_{P2} = 10,000$  kW
2. ✗  $T_{P1} = 10,000$  kW,  $T_{P2} = 20,000$  kW
3. ✗  $T_{P1} = 15,000$  kW,  $T_{P2} = 15,000$  kW
4. ✗  $T_{P1} = 30,000$  kW,  $T_{P2} = 0$

Question Number : 57 Question Id : 5113468697 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A thermal power station was designed to burn coal containing 12% ash. When the plant actually started operating coal having 22% ash was made available. Which unit of the plant will need major modifications?

Options :

1. ✗ Water treatment plant
2. ✗ Pulverizing unit
3. ✓ Ash handling unit
4. ✗ Cooling towers.

Question Number : 58 Question Id : 5113468698 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

What is the expression for fault current in line to line fault?

Options :

1. ✓  $I_f = \sqrt{3} * E_a / (Z_1 + Z_2)$
2. ✗  $I_f = 3 * E_a / (Z_1 + Z_2)$

3. ✘  $I_f = \sqrt{3} * E_a / (Z_1 + Z_2 + Z_0)$

4. ✘  $I_f = 3 * E_a / (Z_1 + Z_2 + Z_0)$

Question Number : 59 Question Id : 5113468699 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

What will be the sum of  $(I_B + I_Y)$  in case of line to line fault, if the fault is occurring in the B and Y lines?

Options :

1. ✘  $\infty$

2. ✔ 0

3. ✘ 1

4. ✘  $I_R$

Question Number : 60 Question Id : 5113468700 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which method of voltage control is applied for long line AC transmissions?

Options :

1. ✘ Switching by shunt capacitors

2. ✘ Tap changing transformers

3. ✔ Switching by shunt reactors

4. ✘ Static Var sources

Question Number : 61 Question Id : 5113468701 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Spot welding is used to weld metal pieces whose thickness

Options :

1. ✘ Should be greater than 12 mm

2. ✘ Greater than 20 mm

3. ✘ Lies between 15 to 20 mm

4. ✓ Lesser than 12 mm

Question Number : 62 Question Id : 5113468702 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In fluorescent lamp one capacitor is connected across the lamp circuit and another is connected across the starter. Then

Options :

1. ✗ Both the capacitors are used for improving power factor

2. ✗ Both the capacitors are used for reducing radio interference

3. ✓

Former capacitor is used for improving power factor and later is used for reducing radio interference

4. ✗

Former capacitor is used for reducing radio interference and later is used for improving power factor

Question Number : 63 Question Id : 5113468703 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The main electrode of high pressure mercury vapour lamp is made up of

Options :

1. ✓ Tungsten

2. ✗ Hard glass

3. ✗ Quartz

4. ✗ Bronze

Question Number : 64 Question Id : 5113468704 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The practical luminous efficiency of the sodium vapour lamp is of the order of

Options :

1. ✗ 25 to 40 lumens per watt

2. ✗ 40 to 45 lumens per watt

3. ✓ 45 to 50 lumens per watt
4. ✗ 60 to 67 lumens per watt

Question Number : 65 Question Id : 5113468705 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

For best visual performance, the range of brightness within the field of vision

Options :

1. ✓ Should be less than 3:1
2. ✗ Should be greater than 3:1
3. ✗ Should be less than 1:3
4. ✗ Should be greater than 1:3

Question Number : 66 Question Id : 5113468706 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Voltage required for butt welding is

Options :

1. ✗ 22 to 30 V
2. ✗ 8 to 15 V
3. ✗ 15 to 22 V
4. ✓ 2 to 8 V

Question Number : 67 Question Id : 5113468707 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The heat required by the weld is produced due to the contact resistance between the two pieces and is

Options :

1. ✗ Directly proportional to the current
2. ✓ Directly proportional to the square of the current
3. ✗ Inversely proportional to the square of the current

4. ✘ Inversely proportional to the current

Question Number : 68 Question Id : 5113468708 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which among the following is mechanical braking?

Options :

1. ✔ Pneumatic braking
2. ✘ Plugging
3. ✘ Dynamic braking
4. ✘ Regenerative braking

Question Number : 69 Question Id : 5113468709 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

For regenerative braking, the motor which is not suitable is

Options :

1. ✘ DC shunt motor
2. ✘ DC compound motor
3. ✔ DC series motor
4. ✘ AC shunt motor

Question Number : 70 Question Id : 5113468710 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Swamping resistance is used to compensate error due to

Options :

1. ✘ Stray magnetic field.
2. ✔ Temperature variations.
3. ✘ Large supply variations.
4. ✘ Eddy current

Question Number : 71 Question Id : 5113468711 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Hay's Bridge is suitable for the measurement of:

Options :

1. ✓ Inductances with  $Q > 10$ .
2. ✗ Inductances with  $Q < 10$ .
3. ✗ Capacitors with high dissipation factor.
4. ✗ Capacitors with low dissipation factor.

Question Number : 72 Question Id : 5113468712 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In a single phase induction type energy meter, the lag adjustment is affected to

Options :

1. ✗ Make the series magnet flux to lag behind the applied voltage by  $90^\circ$
2. ✓ The shunt magnet flux to lag behind the applied voltage by  $90^\circ$
3. ✗ The shunt magnet flux in phase with the applied voltage
4. ✗ The series magnet flux in phase with the applied voltage.

Question Number : 73 Question Id : 5113468713 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Dead time of the instrument is

Options :

1. ✓ the time required by an instrument to being to respond to a change in the measurand.
2. ✗ the time required by an instrument to warm up initially.
3. ✗ the largest change of input quantity for which there is no output of the instrument.
4. ✗ the time required by an instrument to being to respond to no change in the measured.

Question Number : 74 Question Id : 5113468714 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A CRO screen has 10 divisions on the horizontal scale. If a voltage signal  $5\sin(314t + 45^\circ)$  is examined with a line base setting of 5 ms/division, the number of cycle of signal displayed on the screen will be

Options :

1. ✘ 0.5 cycle
2. ✔ 2.5 cycle
3. ✘ 5 cycle
4. ✘ 10 cycle

Question Number : 75 Question Id : 5113468715 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A digital voltmeter has  $4\frac{1}{2}$  digit display. The 1 V range can read upto

Options :

1. ✘ 1.000
2. ✘ 1.111
3. ✔ 1.999
4. ✘ 1999

Question Number : 76 Question Id : 5113468716 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The purpose of providing a mirror behind the pointer in a measuring instrument is

Options :

1. ✘ The scale is illuminated through mirror.
2. ✘ With the help of mirror it can be seen whether the pointer is bent or not.
3. ✘  
The mirror is semi-transparent so as to allow the observation of the interior of the instrument.
4. ✔  
Reading error due to inclined observations are eliminated by removing parallax between the pointer and its image in the mirror.

Question Number : 77 Question Id : 5113468717 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The resolution of a digital ammeter with 3 digital display is

Options :

1. ✘ 1/10000
2. ✔ 1/1000
3. ✘ 1/4
4. ✘ 1/3

Question Number : 78 Question Id : 5113468718 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A drive system with  $T$ ,  $T_1$  and  $\omega$  as motor torque, load torque, and speed respectively, is stable if

Options :

1. ✘  $dT_1/d\omega = dT/d\omega$
2. ✘  $dT/d\omega > dT_1/d\omega$
3. ✔  $dT_1/d\omega > dT/d\omega$
4. ✘  $dT_1/d\omega = 2.dT/d\omega$

Question Number : 79 Question Id : 5113468719 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In self-controlled synchronous motor, inverter frequency is determined

Options :

1. ✘ independently
2. ✔ by shaft speed
3. ✘ by grid frequency
4. ✘ arbitrarily

Question Number : 80 Question Id : 5113468720 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Compared to buck converter, boost converter requires

Options :

1. ✘ smaller filter capacitor
2. ✔ larger filter capacitor
3. ✘ equal value capacitor
4. ✘ very small capacitor

Question Number : 81 Question Id : 5113468721 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The air-gap voltage of induction motor is 108 V at 60 Hz. For operating at 40 Hz air-gap voltage is

Options :

1. ✔ 72 V
2. ✘ 62 V
3. ✘ 88 V
4. ✘ 98 V

Question Number : 82 Question Id : 5113468722 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Asynchronous PWM is used for frequency modulation index greater than

Options :

1. ✘ 11
2. ✔ 21
3. ✘ 31
4. ✘ 41

Question Number : 83 Question Id : 5113468723 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Two silicon diodes D1 and D2 are connected in series. If 1V DC is applied across it, then which of the following statement is correct?

Options :

1. ✘ Both are forward biased
2. ✘ D1 is forward biased and D2 is reverse biased
3. ✔ Both are reversed biased
4. ✘ D1 is reverse biased and D2 is forward biased

Question Number : 84 Question Id : 5113468724 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The stability factor of self biasing circuit is

Options :

1. ✘ 0
2. ✔ 1
3. ✘ 100
4. ✘ 10

Question Number : 85 Question Id : 5113468725 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which among the following is an output provided by transresistance amplifier?

Options :

1. ✘ Output current proportional to signal voltage
2. ✔ Output voltage proportional to signal current
3. ✘ Output voltage proportional to input voltage
4. ✘ Output current proportional to signal current

Question Number : 86 Question Id : 5113468726 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Another name for a unity gain amplifier is

Options :

1. ✘ difference amplifier

2. ✘ comparator
3. ✘ single ended
4. ✔ voltage follower

Question Number : 87 Question Id : 5113468727 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Op-amps used as high- and low-pass filter circuits employ which configuration?

Options :

1. ✘ non-inverting
2. ✘ comparator
3. ✘ open-loop
4. ✔ inverting

Question Number : 88 Question Id : 5113468728 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

What starts a free-running multivibrator?

Options :

1. ✘ a trigger
2. ✘ an input signal
3. ✘ an external circuit
4. ✔ nothing

Question Number : 89 Question Id : 5113468729 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The time period of a monostable 555 multivibrator is given by

Options :

1. ✘  $T = 0.33RC$
2. ✔  $T = 1.1RC$

3. ✘  $T = 3RC$

4. ✘  $T = RC$

Question Number : 90 Question Id : 5113468730 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following circuit is a Parallel-to-Serial converter?

Options :

1. ✔ Digital Counter

2. ✘ Decoder

3. ✘ Demultiplexer

4. ✘ Multiplexer

Question Number : 91 Question Id : 5113468731 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

With four Boolean variables, how many Boolean expressions can be formed?

Options :

1. ✔ 16

2. ✘ 256

3. ✘ 1024

4. ✘ 64K

Question Number : 92 Question Id : 5113468732 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In which configuration a dead band condition occurs in Schmitt trigger

Options :

1. ✘ Differential amplifier with positive feedback

2. ✘ Voltage follower with positive feedback

3. ✔ Comparator with positive feedback

## 4. ✘ Comparator with negative feedback

Question Number : 93 Question Id : 5113468733 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Astable multivibrator is \_\_\_\_\_ in any state.

Options :

1. ✘ Stable
2. ✔ Unstable
3. ✘ Saturated
4. ✘ Stable & Saturated

Question Number : 94 Question Id : 5113468734 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A 4-bit R/2R digital-to-analog (DAC) converter has a reference of 5 volts. What is the analog output for the input code 0101?

Options :

1. ✘ 0.3125 V
2. ✔ 3.125 V
3. ✘ 0.78125 V
4. ✘ -3.125 V

Question Number : 95 Question Id : 5113468735 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In 8085 which addressing mode is called inherent addressing?

Options :

1. ✘ Direct
2. ✘ Register
3. ✔ Implicit
4. ✘ Immediate

Question Number : 96 Question Id : 5113468736 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

For an SCR, gate cathode characteristic is a straight line of 130. For triggered source voltage of 15 V and allowable gate power dissipation of 0.5 W, compute the gate source resistance

Options :

1. ✓ 111.9  $\Omega$
2. ✗ 11.19  $\Omega$
3. ✗ 108  $\Omega$
4. ✗ 115  $\Omega$

Question Number : 97 Question Id : 5113468737 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

An autotransformer having a transformation ratio of 0.8 supplied a load of 20 kW. The power transferred inductively from the primary to the secondary is

Options :

1. ✗ 20 kW
2. ✗ 16 kW
3. ✓ 4 kW
4. ✗ zero

Question Number : 98 Question Id : 5113468738 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A 220 V, 50 Hz single-phase transformer has eddy current loss of 120 W. If the transformer is operated from 440 V, 50 Hz supply main then the eddy current loss will be

Options :

1. ✗ 120 W
2. ✗ 240 W
3. ✗ 360 W
4. ✓ 480 W

Question Number : 99 Question Id : 5113468739 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A lap wound dc machine has 800 conductors and 8 poles and the voltage induced per conductor is 2 V.

The machine generates a voltage of

Options :

1. ✘ 100 V
2. ✔ 200 V
3. ✘ 400 V
4. ✘ 800 V

Question Number : 100 Question Id : 5113468740 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Due to armature reaction in a D.C. generator, the flux under leading pole tip

Options :

1. ✔ always increases
2. ✘ always decreases
3. ✘ may decrease or increase
4. ✘ remains unchanged

Question Number : 101 Question Id : 5113468741 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If external resistance is added to the field of a DC shunt generator, it results in

Options :

1. ✔ decrease in the voltage of the generator
2. ✘ increase in the voltage of the generator
3. ✘ increase in the power delivered
4. ✘ increase in the speed of the generator

Question Number : 102 Question Id : 5113468742 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A 220 V dc series motor takes 25 A when giving its rated output at 1500 rpm. Its resistance is 0.3 ohms.  
The value of resistance which must be added to obtain rated torque at 1000 rpm is

Options :

1. ✘ 1.9 ohms
2. ✔ 2.8 ohms
3. ✘ 3.6 ohms
4. ✘ 6 ohms

Question Number : 103 Question Id : 5113468743 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A 200 V dc shunt motor delivers an output of 17 kW with an input of 20 kW. The field resistance is 50  $\Omega$  and armature resistance is 0.2  $\Omega$ . Maximum efficiency will be obtained when the total armature copper losses are equal to

Options :

1. ✘ 357 W
2. ✔ 1156 W
3. ✘ 1843 W
4. ✘ 2643 W

Question Number : 104 Question Id : 5113468744 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A voltmeter gives 120 oscillations per minute when connected to the rotor of an induction motor. The stator frequency is 50 Hz. The slip of the motor is

Options :

1. ✘ 2%
2. ✘ 2.5%
3. ✔ 4%

4. ✘ 5%

Question Number : 105 Question Id : 5113468745 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A 3-phase, 50 Hz squirrel cage induction motor takes a power input of 30 kW at its full load speed of 1440 rpm. Total stator losses are 1 kW. The slip and rotor ohmic losses at full load are \_\_\_\_\_ respectively.

Options :

1. ✘ 0.02, 600 W
2. ✘ 0.04, 580 W
3. ✔ 0.04, 1160 W
4. ✘ 0.04, 1200 W

Question Number : 106 Question Id : 5113468746 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The starting current of an induction motor is five times the full load current while the full load slip is 4%. The ratio of starting torque to full load torque is

Options :

1. ✘ 0.6
2. ✘ 0.8
3. ✔ 1.0
4. ✘ 1.2

Question Number : 107 Question Id : 5113468747 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Power factor of a synchronous motor is unity when the armature current is

Options :

1. ✘ zero
2. ✔ minimum
3. ✘ maximum

4. ✘ any value between minimum and maximum

Question Number : 108 Question Id : 5113468748 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The speed of a 3-phase induction motor is controlled by controlling its supply frequency. If the speed of the machine is reduced by reducing the frequency by 50% of the rated frequency; to keep the flux in the machine constant, the motor voltage compared to rated voltage must be

Options :

1. ✘ increased by 25%
2. ✘ increased by 50%
3. ✔ decreased by 50%
4. ✘ decreased by 25%

Question Number : 109 Question Id : 5113468749 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A 3-phase synchronous motor is connected to an infinite bus, operates at a leading pf. For a constant load torque, if excitation is increased,

Options :

1. ✘ both load angle  $\delta$  and power factor angle  $\theta$  decrease
2. ✘  $\delta$  and  $\theta$  increase
3. ✘  $\delta$  increases but  $\theta$  decreases
4. ✔  $\delta$  decreases but  $\theta$  increases

Question Number : 110 Question Id : 5113468750 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A transformer, fed from an alternator at 230 V, 50 Hz, has an eddy-current loss of 50 W and a hysteresis loss of 100 W. If the speed of the prime-mover driving the alternator drops to 80% of its previous speed, then eddy-current and hysteresis losses in the transformer would respectively be

Options :

1. ✘ 40 W, 80 W

2. ✓ 32 W, 80 W

3. ✗ 32 W, 64 W

4. ✗ 40 W, 64 W

Question Number : 111 Question Id : 5113468751 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If a hybrid stepper motor has a rotor pitch of  $36^\circ$  and a step angle of  $9^\circ$ , the number of its phases must be

Options :

1. ✓ 4

2. ✗ 2

3. ✗ 3

4. ✗ 6

Question Number : 112 Question Id : 5113468752 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

An SCR has half cycle surge current rating of 3000 A for 50 Hz supply. One cycle surge current will be

Options :

1. ✗ 1500 A

2. ✗ 6000 A

3. ✓ 2121.32 A

4. ✗ 4242.64 A

Question Number : 113 Question Id : 5113468753 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

An SCR is considered to be a semi controlled device because

Options :

1. ✗ it can be turned OFF but not ON with a gate pulse.

2. ✗ it conducts only during one half cycle of an alternating current wave.

3. ✓ it can be turned ON but not OFF with a gate pulse.
4. ✗ it can be turned ON only during one half cycle of an AC.

Question Number : 114 Question Id : 5113468754 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A single phase one pulse controlled circuit has a resistance R and counter emf E load  $400 \sin(314 t)$  as the source voltage. For a load counter emf of 200 V, the range of firing angle control is

Options :

1. ✓  $30^\circ$  to  $150^\circ$ .
2. ✗  $30^\circ$  to  $180^\circ$ .
3. ✗  $60^\circ$  to  $120^\circ$ .
4. ✗  $60^\circ$  to  $180^\circ$ .

Question Number : 115 Question Id : 5113468755 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A single phase full bridge inverter can be operated in load commutation mode in case load consist of

Options :

1. ✗ RL.
2. ✓ RLC underdamped
3. ✗ RLC overdamped.
4. ✗ RLC critically damped.

Question Number : 116 Question Id : 5113468756 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A step up chopper has input voltage of 110 V and output voltage of 150 V. The value of duty cycle is

Options :

1. ✗ 0.32
2. ✓ 0.67

3. ✘ 0.45

4. ✘ 0.27

Question Number : 117 Question Id : 5113468757 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If holding current of a thyristor is 2 mA then latching current can be

Options :

1. ✘ 0.01A

2. ✘ 0.002A

3. ✘ 0.009A

4. ✔ 0.004A

Question Number : 118 Question Id : 5113468758 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In reverse blocking mode of a thyristor

Options :

1. ✘ junction  $J_2$  is in reverse bias and  $J_1, J_3$  are in forward bias2. ✘ junction  $J_3$  is in forward bias and  $J_1, J_2$  are in reverse bias.3. ✔ junctions  $J_1, J_3$  are in reverse bias and  $J_2$  is in forward bias4. ✘ junctions  $J_1, J_2$  are in forward bias and  $J_3$  is in reverse bias.

Question Number : 119 Question Id : 5113468759 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

For Thyristors, which type of triggering is the most reliable?

Options :

1. ✘ Forward voltage triggering

2. ✔ Gate triggering.

3. ✘  $dV / dt$  triggering

4. ✘ Thermal triggering.

Question Number : 120 Question Id : 5113468760 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Under normal operating condition voltage clamping device offers impedance of

Options :

1. ✔ high value
2. ✘ low value.
3. ✘ zero value
4. ✘ moderate value.