

# Telangana State Council Higher Education

## Notations :

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

|                                         |                                               |
|-----------------------------------------|-----------------------------------------------|
| Question Paper Name :                   | Electrical Engineering 10th June 2024 Shift 2 |
| Subject Name :                          | Electrical Engineering                        |
| Creation Date :                         | 2024-06-11 14:25:20                           |
| Duration :                              | 120                                           |
| Total Marks :                           | 120                                           |
| Display Marks:                          | Yes                                           |
| Share Answer Key With Delivery Engine : | Yes                                           |
| Actual Answer Key :                     | Yes                                           |
| Change Font Color :                     | No                                            |
| Change Background Color :               | No                                            |
| Change Theme :                          | No                                            |
| Help Button :                           | No                                            |
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| Show Progress Bar :                     | No                                            |

## Electrical Engineering

|                          |          |
|--------------------------|----------|
| Group Number :           | 1        |
| Group Id :               | 38382332 |
| Group Maximum Duration : | 0        |
| Group Minimum Duration : | 120      |
| Show Attended Group? :   | No       |
| Edit Attended Group? :   | No       |
| Break time :             | 0        |
| Group Marks :            | 120      |

## Mathematics

|                         |           |
|-------------------------|-----------|
| Section Id :            | 38382395  |
| Section Number :        | 1         |
| Section type :          | Online    |
| Mandatory or Optional : | Mandatory |
| Number of Questions :   | 10        |

Number of Questions to be attempted : 10  
Section Marks : 10  
Maximum Instruction Time : 0  
Sub-Section Number : 1  
Sub-Section Id : 38382395  
Question Shuffling Allowed : Yes

Question Number : 1 Question Id : 3838234681 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1

If  $\lambda_1, \lambda_2$  and  $\lambda_3$  are the eigenvalues of the matrix  $A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & -3 & 1 \\ 0 & 0 & 4 \end{bmatrix}$  then the values of

$(\lambda_1 + \lambda_2 + \lambda_3)$  and  $(\lambda_1 \cdot \lambda_2 \cdot \lambda_3)$  are respectively

Options :

1. ✖ 1 and 3
2. ✖ -3 and 4
3. ✖ 4 and 12
4. ✔ 2 and -12

Question Number : 2 Question Id : 3838234682 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1

If A is  $\begin{bmatrix} 2024 & 2021 \\ 2023 & 2022 \end{bmatrix}$  then the value of  $|A^{2024} - A^{2023}|$  is

Options :

1. ✖ 2024
2. ✖ 1
3. ✔ 0
4. ✖ 2023

Question Number : 3 Question Id : 3838234683 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

Among the following, Rolle's theorem is not applicable for

Options :

1. ✖  $f(x) = x^3 - 4x$  in  $[-2, 2]$
2. ✔  $f(x) = |x|$  in  $[-1, 1]$
3. ✖  $f(x) = (x-a)^m (x-b)^n$  in  $[a, b], m, n > 0$
4. ✖  $f(x) = x^2 - 3x + 2$  in  $[1, 2]$

Question Number : 4 Question Id : 3838234684 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

If the function  $u = \sin^{-1}\left(\frac{x^3 + y^3}{x + y}\right)$  then  $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} =$

Options :

1. ✔  $2 \tan u$
2. ✖  $3 \operatorname{cosec} u$
3. ✖  $3 \sin u$
4. ✖  $2 \cos u$

Question Number : 5 Question Id : 3838234685 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

The integrating factor of  $\frac{dy}{dx} + y \cot x = 2x + x^2 \cot x$  is

Options :

1. ✔  $\sin x$
2. ✖  $\cos x$

3. ✖  $\cot x$

4. ✖  $\tan x$

Question Number : 6 Question Id : 3838234686 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

Particular integral of  $\frac{dy}{dx} + y = e^{ex}$  is

Options :

1. ✖  $e^{ex}$

2. ✖  $e^x$

3. ✔  $e^{-x}e^{ex}$

4. ✖  $e^xe^{ex}$

Question Number : 7 Question Id : 3838234687 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

The value of the integral  $\int_C \frac{2e^z}{(z-4)(z-2)} dz$  where  $C:|z|=3$  is

Options :

1. ✖  $-\pi ie^2$

2. ✔  $-2\pi ie^2$

3. ✖  $2\pi ie^{-2}$

4. ✖  $\pi ie^{-2}$

Question Number : 8 Question Id : 3838234688 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

If  $f(x) = \begin{cases} -\pi, & -\pi < x < 0 \\ x, & 0 < x < \pi \end{cases}$  then the constant term of the Fourier series is

Options :

1. ✖  $-\frac{\pi}{2}$

2. ✖  $-\pi$

3. ✖  $\frac{\pi}{2}$

4. ✔  $-\frac{\pi}{4}$

Question Number : 9 Question Id : 3838234689 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

Newton-Raphson iterative formula for finding  $\frac{1}{\sqrt{N}}, (N > 0)$  is

Options :

1. ✖  $x_{n+1} = x_n(2 - Nx_n)$

2. ✖  $x_{n+1} = \frac{1}{2} \left( x_n + \frac{N}{x_n} \right)$

3. ✔  $x_{n+1} = \frac{1}{2} \left( x_n + \frac{1}{Nx_n} \right)$

4. ✖  $x_{n+1} = \frac{1}{3} \left( x_n + \frac{1}{Nx_n} \right)$

Question Number : 10 Question Id : 3838234690 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

The mean and variance of a random variable X having a Binomial distribution are 4 and 2 respectively, then  $P(X=1)$  is

**Options :**

1. ✓  $\frac{1}{32}$

2. ✗  $\frac{1}{8}$

3. ✗  $\frac{1}{16}$

4. ✗  $\frac{1}{5}$

## Electrical Engineering

|                                       |           |
|---------------------------------------|-----------|
| Section Id :                          | 38382396  |
| Section Number :                      | 2         |
| Section type :                        | Online    |
| Mandatory or Optional :               | Mandatory |
| Number of Questions :                 | 110       |
| Number of Questions to be attempted : | 110       |
| Section Marks :                       | 110       |
| Maximum Instruction Time :            | 0         |
| Sub-Section Number :                  | 1         |
| Sub-Section Id :                      | 38382396  |
| Question Shuffling Allowed :          | Yes       |

Question Number : 11 Question Id : 3838234691 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

A 1- $\phi$ , RC series circuit has  $R = 5 \Omega$  and  $C = 10 \mu F$ . If the angular frequency of current is 20000 rad/sec, then the applied voltage

**Options :**

1. ✓ Lags the current by  $\pi/4$  radians

2. ✗ Leads the current by  $\pi/4$  radians

- 3. ✖ Lags the current by  $\pi/2$  radians
- 4. ✖ Leads the current by  $\pi/2$  radians

**Question Number : 12 Question Id : 3838234692 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A source voltage of 100 V dc is applied across a RLC series circuit. Under steady-state conditions, voltages across each element is

**Options :**

- 1. ✖  $V_R = 100V, V_L = 0, V_C = 0$
- 2. ✖  $V_R = 100V, V_L = -100V, V_C = 100V$
- 3. ✖  $V_R = 0, V_L = 100V, V_C = -100V$
- 4. ✔  $V_R = 0, V_L = 0, V_C = 100V$

**Question Number : 13 Question Id : 3838234693 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The equivalent inductance of two equal inductances when connected in series aiding is 14 H and when connected on series opposing is 6 H. What is the coefficient of coupling?

**Options :**

- 1. ✖ 0.5
- 2. ✖ 0.8
- 3. ✔ 0.4
- 4. ✖ 1.0

**Question Number : 14 Question Id : 3838234694 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Certain resistors connected in parallel and the equivalent resistance is X. If one of the resistances is removed the equivalent resistance is Y. What is the conductance value of removed resistance?

**Options :**

1. ✖  $\frac{XY}{Y-X}$

2. ✖  $\frac{XY}{X-Y}$

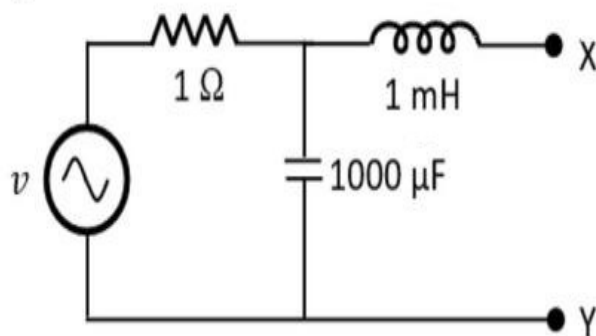
3. ✖  $\frac{X-Y}{XY}$

4. ✔  $\frac{Y-X}{XY}$

**Question Number : 15 Question Id : 3838234695 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

For an input voltage  $v = 10 \sin 1000t$ , the Thevenin's impedance at the terminals X and Y for the following circuit is



**Options :**

1. ✔  $0.5 + j0.5$

2. ✖  $0.5 - j0.5$

3. ✖  $1.0 + j1$

4. ✖  $1.0 - j1$



Question Number : 16 Question Id : 3838234696 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

A signal of  $v = 5 + 10\sin\omega t$  is applied across a  $2\ \Omega$  resistor. The power dissipated in the resistor is

Options :

1. ✖ 75 W
2. ✔ 37.5 W
3. ✖ 62.5 W
4. ✖ 125 W

Question Number : 17 Question Id : 3838234697 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

Three impedances  $6 + j(10/3)\ \Omega$  each are connected in delta. The per phase impedance of equivalent star circuit will be

Options :

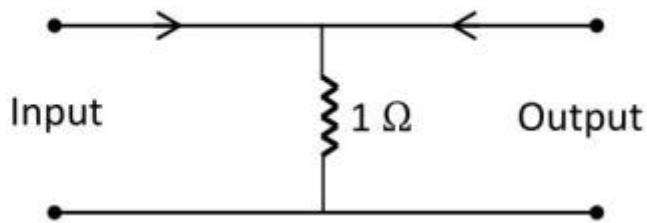
1. ✖  $18 + j(10/9)\ \Omega$
2. ✖  $2 + j(10/3)\ \Omega$
3. ✔  $2 + j(10/9)\ \Omega$
4. ✖  $18 + j10\ \Omega$

Question Number : 18 Question Id : 3838234698 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

The  $h$  parameters of the following circuit is



Options :

1. ✖  $h = \begin{bmatrix} 0 & 1 \\ 1 & -1 \end{bmatrix}$

2. ✖  $h = \begin{bmatrix} 0 & -1 \\ -1 & 1 \end{bmatrix}$

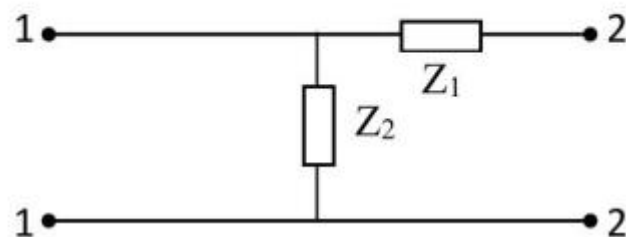
3. ✖  $h = \begin{bmatrix} 0 & -1 \\ 1 & 1 \end{bmatrix}$

4. ✔  $h = \begin{bmatrix} 0 & 1 \\ -1 & 1 \end{bmatrix}$

Question Number : 19 Question Id : 3838234699 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1

The  $Z$  parameter  $Z_{21}$  of the following circuit is



Options :

1. ✔  $Z_2$

2. ✖  $Z_1$

3. ✖  $Z_1 + Z_2$

4. ✖  $-Z_2$

**Question Number : 20 Question Id : 3838234700 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

In a 3- $\phi$  star connected balanced circuit, if angle between phase voltage  $V_P$  and phase current  $I_P$  is  $\theta$  (leading), then the wattmeter readings in two wattmeter method are

**Options :**

1. ✖  $\sqrt{3}V_P I_P \cos(30^\circ + \theta)$  and  $\sqrt{3}V_P I_P \cos(60^\circ - \theta)$
2. ✖  $3V_P I_P \cos(30^\circ + \theta)$  and  $3V_P I_P \cos(60^\circ - \theta)$
3. ✖  $V_P I_P \cos(30^\circ + \theta)$  and  $V_P I_P \cos(30^\circ - \theta)$
4. ✔  $\sqrt{3}V_P I_P \cos(30^\circ + \theta)$  and  $\sqrt{3}V_P I_P \cos(30^\circ - \theta)$

**Question Number : 21 Question Id : 3838234701 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Choose correct statement of Reciprocity theorem in single source network

**Options :**

- The ratio of response to excitation is variant to an interchange of the positions of the excitation and response, if the excitation is a current source, the response
1. ✖ should be a voltage source
- The ratio of response to excitation is invariant to an interchange of the positions of the excitation and response, if the excitation is a voltage source, the response
2. ✖ should be a voltage source
- The ratio of response to excitation is invariant to an interchange of the positions of the excitation and response, if the excitation is a voltage source, the response
3. ✔ should be a current source
  4. ✖

The ratio of response to excitation is invariant to an interchange of the positions of the excitation and response, if the excitation is a current source, the response should be a current source

**Question Number : 22 Question Id : 3838234702 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

If BW is band width,  $\omega_r$  is resonant frequency and Q is Quality factor of a resonant circuit, then Selectivity is defined as

**Options :**

1. ✖  $\frac{\omega_r}{Q}$

2. ✖  $\frac{Q}{\omega_r}$

3. ✔  $\frac{\omega_r}{BW}$

4. ✖  $\frac{BW}{\omega_r}$

**Question Number : 23 Question Id : 3838234703 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The response of a 1- $\phi$  R-L series circuit is  $i(t) = Ae^{-\frac{Rt}{L}} + B\sin(\omega t)$ . Then the supply voltage should be

**Options :**

1. ✔  $V_m \sin(\omega t + \phi)$

2. ✖  $V_m \sin(\omega t - \phi)$

3. ✖  $V_m \sin(\omega t)$

4. ✖  $V_m \sin(\omega t) + \text{Exponential source}$

Question Number : 24 Question Id : 3838234704 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

Point charges  $Q_1 = 1 \text{ nC}$  and  $Q_2 = 2 \text{ nC}$  are at a distance apart. Which of the following statement is incorrect?

Options :

1. ✖ The force on  $Q_1$  is repulsive
2. ✖ The force on  $Q_2$  is the same in magnitude on  $Q_1$
3. ✔ As the distance between them decreases, the force on  $Q_1$  increases linearly
4. ✖ The force on  $Q_2$  is along the line joining them

Question Number : 25 Question Id : 3838234705 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

If  $\nabla \cdot D = \rho$  and  $\nabla \cdot J = \sigma \nabla \cdot E$  in a given material, the material is said to be

Options :

1. ✖ Linear and Isotropic
2. ✔ Linear and homogeneous
3. ✖ Isotropic only
4. ✖ Isotropic and homogeneous

Question Number : 26 Question Id : 3838234706 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

Two identical coaxial circular coils carry the same current  $I$  amp but in opposite directions. The magnitude of the magnetic field  $B$  at a point on the axis midway between the coils is

Options :

1. ✔ Zero

- 2. ✖ The same as that produced by one coil
- 3. ✖ Twice that produced by one coil
- 4. ✖ Half that produced by one coil

**Question Number : 27 Question Id : 3838234707 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Magnetic dipole moment is \_\_\_\_\_ of the loop, its direction is normal to the loop

**Options :**

- 1. ✖ the sum of current and area
- 2. ✖ the product of current and volume
- 3. ✖ the sum of current and volume
- 4. ✔ the product of current and area

**Question Number : 28 Question Id : 3838234708 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

$\nabla \cdot \mathbf{B} = 0$ , shows that

**Options :**

- 1. ✖ Electrostatic fields have no sources or sinks
- 2. ✔ Magnetostatic fields have no sources or sinks
- 3. ✖ Electrostatic fields have two sources and two sinks
- 4. ✖ Magnetostatic fields have two sources and one sink

**Question Number : 29 Question Id : 3838234709 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The reciprocal of reluctance is



**Options :**

1. ✘ permeability
2. ✘ permittivity
3. ✔ permeance
4. ✘ conductance

**Question Number : 30 Question Id : 3838234710 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1**

The magnetization  $M$ , in amperes per meter is

**Options :**

1. ✔ Magnetic dipole moment per unit volume
2. ✘ Volume/ unit Magnetic dipole moment
3. ✘ Magnetic dipole moment per unit area
4. ✘ Magnetic dipole moment per unit length

**Question Number : 31 Question Id : 3838234711 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1**

The slip-speed of a 3- $\phi$ , 6-pole, 50 Hz, induction motor is 20 rpm at no-load. If slip-speed is doubled due to load, then the electrical equivalent of mechanical load will

**Options :**

1. ✘ remain same
2. ✘ be exactly doubled
3. ✘ be more than doubled
4. ✔ be less than halved

**Question Number : 32 Question Id : 3838234712 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The time period of rotor current of a 3- $\phi$ , 4-pole, 50 Hz, induction motor is 200 ms. Then slip speed of the motor is

**Options :**

1. ✖ 1425 rpm
2. ✖ 1350 rpm
3. ✖ 75 rpm
4. ✔ 150 rpm

**Question Number : 33 Question Id : 3838234713 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The current and power factor of a 3 – phase induction motor at no-load are respectively

**Options :**

1. ✖ 2 to 6 % of rated current and 0.2 lagging
2. ✔ 30 to 40 % of rated current and 0.2 lagging
3. ✖ 2 to 6 % of rated current and 0.8 lagging
4. ✖ 30 to 40 % of rated current and 0.8 lagging

**Question Number : 34 Question Id : 3838234714 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A 3- $\phi$ , 400 V, 50 Hz, 8 pole induction motor has rotor resistance and standstill reactance of 0.08  $\Omega$  and 0.4  $\Omega$  respectively. What is its approximate speed at maximum torque?

**Options :**

1. ✔ 600 rpm
2. ✖ 750 rpm



3. ✖ 150 rpm

4. ✖ 335 rpm

**Question Number : 35 Question Id : 3838234715 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The external rotor resistance of a 3- $\phi$  induction motor is increased more than the resistance required to get maximum starting torque. Then maximum torque occurs in \_\_\_\_\_ of Torque (y-axis) – Speed (x-axis) characteristic plot.

**Options :**

1. ✔ Second Quadrant

2. ✖ Third Quadrant

3. ✖ Fourth Quadrant

4. ✖ First Quadrant

**Question Number : 36 Question Id : 3838234716 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A 1- $\phi$ , 230 V, 50 Hz transformer is operated at 230 V, 60 Hz. Then its

**Options :**

1. ✖ Eddy current loss will remain same and Hysteresis loss will increase

2. ✔ Eddy current loss will remain same and Hysteresis loss will decrease

3. ✖ Eddy current loss will decrease and Hysteresis loss will remain same

4. ✖ Eddy current loss will increase and Hysteresis loss will also increase

**Question Number : 37 Question Id : 3838234717 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Indicate a correct choice on currents during open circuit (OC) and short circuit (SC) tests of transformer

**Options :**

1. ✖ OC test at rated current & SC test at rated current
2. ✖ OC test at rated current & SC test at no-load current
3. ✖ OC test at no-load current & SC test at no-load current
4. ✔ OC test at rated voltage & SC test at rated current

**Question Number : 38 Question Id : 3838234718 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A 11/33 kV, 100 MVA, 3-phase transformer has equivalent impedance seen from LV side of  $(1.21 + j 4.84) \Omega$ . The per unit impedance of the transformer is

**Options :**

1. ✖  $0.5 + j 2$
2. ✔  $1 + j 4$
3. ✖  $2 + j 8$
4. ✖  $0.25 + j 1$

**Question Number : 39 Question Id : 3838234719 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

If R and X are equivalent resistance and equivalent reactance of a transformer respectively, then at maximum voltage regulation, the power factor is

**Options :**

1. ✖  $R/\sqrt{X^2 - R^2}$  leading
2. ✖  $X/\sqrt{X^2 - R^2}$  lagging
3. ✔  $R/\sqrt{X^2 + R^2}$  lagging

4. ✖  $X/\sqrt{X^2 + R^2}$  leading

Question Number : 40 Question Id : 3838234720 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

On two sides of a 3- $\phi$  star / delta transformer the

Options :

1. ✖ Voltages differ by  $60^\circ$  and currents differ by  $30^\circ$

2. ✖ Voltages differ by  $30^\circ$  and currents differ by  $60^\circ$

3. ✖ Both voltages and currents differ by  $60^\circ$

4. ✔ Both voltages and currents differ by  $30^\circ$

Question Number : 41 Question Id : 3838234721 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

The input of a 85% efficiency, 2000 rpm separately excited dc motor is 5 kW. The torque output is

Options :

1. ✖ 28.1 Nm

2. ✖ 23.9 Nm

3. ✔ 20.3 Nm

4. ✖ 19.1 Nm

Question Number : 42 Question Id : 3838234722 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

The speed of a d.c series motor at an armature current of 10 A is 800 rpm. If load torque is proportional to square of speed, then at 5 A the speed will be

**Options :**

1. ✓ 400 rpm
2. ✗ 200 rpm
3. ✗ 1600 rpm
4. ✗ 3200 rpm

**Question Number : 43 Question Id : 3838234723 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

If  $R_1$ ,  $R_2$ ,  $R_3$ ,  $R_4$  and  $R_5$  are resistances of each of five sections of starter of dc shunt motor, then these resistances are

**Options :**

1. ✓ not in Geometric progression
2. ✗ in Geometric progression
3. ✗ in Arithmetic progression
4. ✗ in Harmonic progression

**Question Number : 44 Question Id : 3838234724 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Dummy coils are used in wave wound d.c machines to reduce

**Options :**

1. ✗ Hysteresis losses
2. ✓ Mechanical imbalance on armature
3. ✗ Frictional losses

4. ✖ Mechanical imbalance on iron frame

Question Number : 45 Question Id : 3838234725 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

Choose a wrong choice on d.c machine regarding compoles or compensating winding

Options :

- 1. ✖ Compoles neutralize reactance voltage
- 2. ✖ Compensated winding is connected in series with armature
- 3. ✔ Compole winding neutralize de-magnetizing effect of armature reaction
- 4. ✖ Compensating winding neutralize cross-magnetizing effect of armature reaction

Question Number : 46 Question Id : 3838234726 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

Swinburne's test measures the following on a 200 V, 15 kW d.c shunt motor:

Input current = 7 A; Field current = 2 A. Estimate field copper loss and iron & frictional losses. Assume  $R_a = 0.04 \Omega$ .

Options :

- 1. ✖ 400 W, 998 W respectively
- 2. ✖ 999 W, 400 W respectively
- 3. ✔ 400 W, 999 W respectively
- 4. ✖ 998 W, 400 W respectively

Question Number : 47 Question Id : 3838234727 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

If short pitch angle of a 3- $\phi$ , 2 pole synchronous machine is  $30^\circ$ , then pitch factor is

**Options :**

1. ✖  $\frac{\sqrt{2 - \sqrt{3}}}{\sqrt{2}}$

2. ✖  $\frac{\sqrt{2 + \sqrt{3}}}{\sqrt{2}}$

3. ✖  $\frac{\sqrt{2 - \sqrt{3}}}{2}$

4. ✔  $\frac{\sqrt{2 + \sqrt{3}}}{2}$

**Question Number : 48 Question Id : 3838234728 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Speed of 3- $\phi$  synchronous motor can be controlled by varying frequency at constant torque at

**Options :**

1. ✔ Variable voltage and constant current

2. ✖ Variable voltage and variable current

3. ✖ constant voltage and constant current

4. ✖ constant voltage and variable current

**Question Number : 49 Question Id : 3838234729 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

If voltage of a dc servo-motor increases, then the Torque-speed characteristic and slope respectively are

**Options :**

1. ✔ Linear, negative



- 2. ✖ Linear, positive
- 3. ✖ Non-Linear, negative
- 4. ✖ Non-Linear, positive

Question Number : 50 Question Id : 3838234730 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

The step angle of a stepper motor is given by

Options :

- 1. ✖  $180^\circ / (\text{No. of stator phases} \times \text{No. of rotor teeth})$
- 2. ✔  $360^\circ / (\text{No. of stator phases} \times \text{No. of rotor teeth})$
- 3. ✖  $360^\circ / (\text{No. of stator teeth} \times \text{No. of rotor teeth})$
- 4. ✖  $180^\circ / (\text{No. of stator teeth} \times \text{No. of rotor teeth})$

Question Number : 51 Question Id : 3838234731 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

Choose the correct one

Options :

Whenever a short circuit takes place at a bus with higher short circuit capacity, high

- 1. ✔ current flows in the bus

Whenever a short circuit takes place at a bus with lower short circuit capacity, high

- 2. ✖ current flows in the bus

Whenever a short circuit takes place at a bus with higher short circuit capacity, low

- 3. ✖ current flows in the bus

Whenever a short circuit takes place at a bus with higher short circuit capacity, zero

- 4. ✖ current flows in the bus



Question Number : 52 Question Id : 3838234732 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

\_\_\_\_\_ Relay is a voltage restrained directional relay

Options :

Reactance

1. ✖

Over current

2. ✖

Mho

3. ✔

Impedance

4. ✖

Question Number : 53 Question Id : 3838234733 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

A travelling wave of 500/1/55 means a crest value of

Options :

1. ✖ 500 kV with rise time of 1 ms and fall time of 55 ms

2. ✖ 500 kV with rise time of 1 ms and fall time of 55  $\mu$ s

3. ✖ 500 V with rise time of 1  $\mu$ s and fall time of 55 ms

4. ✔ 500 kV with rise time of 1  $\mu$ s and fall time of 55  $\mu$ s

Question Number : 54 Question Id : 3838234734 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

The quantities to be obtained at slack bus with usual notations are

Options :

1. ✖  $Q, \delta$

2. ✔

$P, |V|$

3. ✖  $P, Q$

4. ✖  $|V|, \delta$

Question Number : 55 Question Id : 3838234735 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

Choose the correct one

Options :

- 1. ✖ Ybus matrix and Zbus matrix are sparse
- 2. ✖ Jacobian matrix and Zbus matrix are not sparse
- 3. ✔ Ybus matrix and Jacobian matrix are sparse
- 4. ✖ Ybus matrix sparse and Jacobian matrix is not sparse

Question Number : 56 Question Id : 3838234736 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

Typical values of time constants of a load frequency control system in case of thermal power generation system are related as

(sg : speed governor ; ps: power system and t: turbine)

Options :

- 1. ✔  $T_{sg} < T_t \ll T_{ps}$
- 2. ✖  $T_{sg} < T_{ps} \ll T_t$
- 3. ✖  $T_{sg} = T_{ps} \gg T_t$
- 4. ✖  $T_{sg} = T_t = T_{ps}$

Question Number : 57 Question Id : 3838234737 Question Type : MCQ Option Shuffling : Yes

**Display Question Number : Yes**

**Correct Marks : 1**

\_\_\_\_\_ fault analysis is used to calculate the rupturing capacity of circuit breakers

**Options :**

1. ✖ Single line to Ground
2. ✖ Double line
3. ✔ Three phases
4. ✖ Double line to Ground

**Question Number : 58 Question Id : 3838234738 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1**

By using bundle conductor \_\_\_\_\_

**Options :**

1. ✖ The self GMD is decreased, the inductance is reduced, the surge impedance is reduced
2. ✔ The self GMD is increased, the inductance is reduced, the surge impedance is reduced
3. ✖ The self GMD is increased, the inductance is increased, the surge impedance is reduced
4. ✖ The self GMD is increased, the inductance is reduced, the surge impedance is increased

**Question Number : 59 Question Id : 3838234739 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1**

The typical values of voltage regulation and efficiency of a medium transmission line respectively are

**Options :**

1. ✖ 92 % and 94%
2. ✖ 6 % and 18%
3. ✔ 6 % and 94%

4. ✖ 92 % and 6%

**Question Number : 60 Question Id : 3838234740 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

In case of a transmission lines, the corona \_\_\_\_\_

**Options :**

- 1. ✔ Reduces the magnitude of high voltage steep fronted waves due to lighting or switching
- 2. ✖ Increases the magnitude of high voltage steep fronted waves due to lighting or switching
- 3. ✖ First increase and then decreases the magnitude of high voltage steep fronted waves due to lighting or switching
- 4. ✖ First reduces and then increases the magnitude of high voltage steep fronted waves due to lighting or switching

**Question Number : 61 Question Id : 3838234741 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

In case of overhead lines, normally \_\_\_\_\_ insulators are used at road crossings

**Options :**

- 1. ✔ Strain type
- 2. ✖ Pin type
- 3. ✖ Suspension type
- 4. ✖ Both Pin type and Suspension Type

**Question Number : 62 Question Id : 3838234742 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

In case of voltage control of a power system network, for the same voltage boost the reactive power capacity of a shunt capacitor is \_\_\_\_\_ that of a series capacitor.

**Options :**

1. ✖ Smaller than
2. ✔ Higher than
3. ✖ 0.75 times
4. ✖ Equal to

**Question Number : 63 Question Id : 3838234743 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Choose the correct one

**Options :**

The zero sequence voltages are three phase voltages and they give rotating field in

1. ✖ space

The zero sequence voltages are three phase voltages and they give an alternating field

2. ✔ in space

The zero sequence voltages are single phase voltages and they give an alternating field

3. ✖ in space

The zero sequence voltages are single phase voltages and they give rotating field in

4. ✖ space

**Question Number : 64 Question Id : 3838234744 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Short circuit MVA of 3-phase alternator is \_\_\_\_\_

**Options :**

1. ✖ Directly proportional to  $Z_{pu}$
2. ✖ Inversely proportional to square of  $Z_{pu}$

3. ✓ Inversely proportional to  $Z_{pu}$

4. ✗ Directly proportional to square of  $Z_{pu}$

Question Number : 65 Question Id : 3838234745 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

The steady state stability limit of a power system can be increased by

Options :

1. ✗ Decreasing the excitation of a generator

2. ✗ Increasing the reactance

3. ✓ Reducing the reactance

4. ✗ Using shunt reactors

Question Number : 66 Question Id : 3838234746 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

The line trap unit employed in carrier current relaying offers

Options :

1. ✗ High impedance to 50 Hz power frequency signals

2. ✓ High impedance to carrier frequency signals

3. ✗ Low impedance to carrier frequency signals

4. ✗ Low impedance to 50 Hz power frequency signals

Question Number : 67 Question Id : 3838234747 Question Type : MCQ Option Shuffling : Yes



**Display Question Number : Yes**

**Correct Marks : 1**

The order of the lightning discharge current is

**Options :**

1. ✓ 10000 A
2. ✗ 100 A
3. ✗ 1 A
4. ✗ 1  $\mu$ A

**Question Number : 68 Question Id : 3838234748 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1**

Consider the following statements

1. by using bundled conductors in an overhead line, the corona loss is reduced
2. by using bundled conductors, the inductance of transmission line increases and capacitance reduces
3. corona loss causes interference in adjoining communication lines

Which of these statements are correct?

**Options :**

1. ✗ 1 and 2
2. ✗ 2 and 3
3. ✓ 1 and 3
4. ✗ 1, 2 and 3

**Question Number : 69 Question Id : 3838234749 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1**

The maximum reactive power generation of a generator is limited because of \_\_\_\_\_

**Options :**

1. ✗ Stability limit of the machine



2. ✓ Overheating of the rotor
3. ✗ Flame instability of a boiler
4. ✗ Over heating of the stator windings

**Question Number : 70 Question Id : 3838234750 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A stranded conductor is expressed as 19/0.1 where the first number corresponds to \_\_\_\_\_ and the second number corresponds to \_\_\_\_\_.

**Options :**

1. ✗ Number of strands, radius of each strand
2. ✓ Number of strands, diameter of each strand
3. ✗ SWG of each strand, radius of each strand
4. ✗ SWG of each strand, diameter of each strand

**Question Number : 71 Question Id : 3838234751 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

For open loop system, the sensitivity of overall transfer function for a small change in forward path transfer function  $G(S)$  is

**Options :**

1. ✓ 1
2. ✗ 0
3. ✗ -1
4. ✗  $\infty$

Question Number : 72 Question Id : 3838234752 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

If  $R(s)$  is input signal,  $C(s)$  is output signal and  $G(s)H(s)$  is feed-back signal, then the steady-state error is given by

Options :

1. ✖  $e_{ss} = \lim_{s \rightarrow 0} \frac{sR(s)}{1 + sG(s)H(s)}$

2. ✔  $e_{ss} = \lim_{s \rightarrow 0} \frac{sR(s)}{1 + G(s)H(s)}$

3. ✖  $e_{ss} = \lim_{s \rightarrow 0} \frac{R(s)}{1 + sG(s)H(s)}$

4. ✖  $e_{ss} = \lim_{s \rightarrow 0} \frac{R(s)}{1 + G(s)H(s)}$

Question Number : 73 Question Id : 3838234753 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

If the phase angle at gain cross-over frequency of a system is  $-116^\circ$ , then the phase margin will be

Options :

1. ✖  $-64^\circ$

2. ✖  $116^\circ$

3. ✔  $64^\circ$

4. ✖  $-116^\circ$

Question Number : 74 Question Id : 3838234754 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

For the given transfer function  $G(s) = \frac{5(1+s)}{(1+4s)(1+0.25s)}$ , for large value of  $\omega$ , the slope of the transfer function on the bode plot is

**Options :**

1. ✖ 20 dB/decade
2. ✖ -40 dB/decade
3. ✖ 40 dB/decade
4. ✔ -20 dB/decade

**Question Number : 75 Question Id : 3838234755 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A unity feedback system has open loop transfer function  $\frac{1}{s(s+5)}$ , then the closed loop transfer function is

**Options :**

1. ✖  $\frac{1}{(s^2 + 5s)}$
2. ✖  $\frac{1}{(5s^2 + s)}$
3. ✔  $\frac{1}{(s^2 + 5s + 1)}$
4. ✖  $\frac{s}{(s^2 + 5s + 1)}$

**Question Number : 76 Question Id : 3838234756 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The value of k, where root locus cut the  $j\omega$  axis in plotting root locus is calculated by

**Options :**

1. ✖ taking  $\frac{dk}{ds} = 0$

2. ✖ where the first asymptote cut the  $j\omega$  axis

3. ✖ Bode Plot

4. ✔ Route-Hurwitz method

**Question Number : 77 Question Id : 3838234757 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A system has the following characteristic polynomial equation and it has three sign changes in first column of Routh array. Choose correct choice for the number of roots on right and left side of s-plane.

$$9s^5 - 20s^4 + 10s^3 - s^2 - 9s - 10 = 0$$

**Options :**

1. ✔ 3 roots on right side & 2 roots on left side

2. ✖ 2 roots on right side & 3 roots on left side

3. ✖ 4 roots on right side & 1 root on left side

4. ✖ 1 root on right side & 4 roots on left side

**Question Number : 78 Question Id : 3838234758 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Choose the correct combination of the following

(a) At break-away point the root locus breaks from real axis into complex plane

(b) At break-away point the root locus breaks from imaginary axis into complex plane

(c) At break-in point the root locus enters the real axis from the complex plane

(d) At break-in point the root locus enters the imaginary axis from the complex plane

**Options :**

1. ✖ (b) & (c) are true

2. ✔ (a) & (c) are true

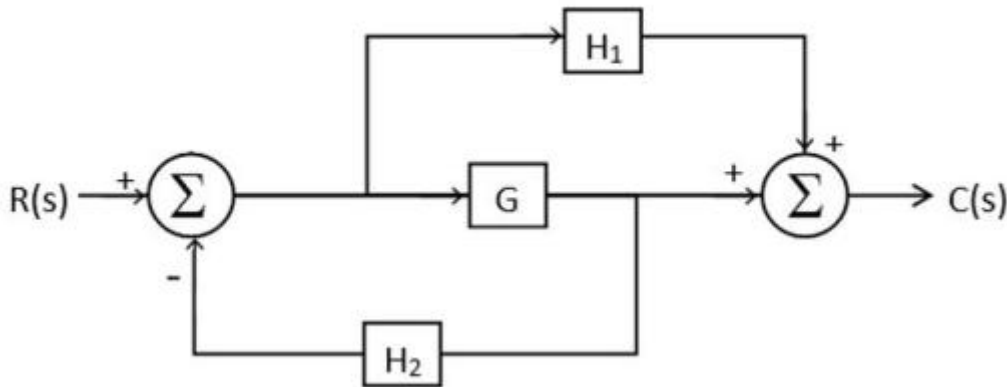
3. ✖ (b) & (d) are true

4. ✖ (a) & (d) are true

Question Number : 79 Question Id : 3838234759 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1

The transfer function of the following system is



Options :

1. ✖  $\frac{C(s)}{R(s)} = \frac{G - H_1}{1 + GH_2}$

2. ✖  $\frac{C(s)}{R(s)} = \frac{G + H_1}{1 - GH_2}$

3. ✔  $\frac{C(s)}{R(s)} = \frac{G + H_1}{1 + GH_2}$

4. ✖  $\frac{C(s)}{R(s)} = \frac{G - H_1}{1 - GH_2}$

Question Number : 80 Question Id : 3838234760 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1

Find the frequency of sustained oscillations for the following system when  $K = 48$ .

$$G(s)H(s) = \frac{K}{s(s+2)(s+4)}$$

Options :

1. ✖  $\sqrt{6}$  rad/sec

2. ✖ 2 rad/sec
3. ✖  $\sqrt{2}$  rad/sec
4. ✔  $\sqrt{8}$  rad/sec

**Question Number : 81 Question Id : 3838234761 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Find gain of the following open loop system having phase cross-over frequency of 1.732 rad/sec.

$$G(s)H(s) = \frac{1}{(s+1)^3}$$

**Options :**

1. ✔  $1/8$
2. ✖  $3/\sqrt{10}$
3. ✖  $1/4$
4. ✖ 8

**Question Number : 82 Question Id : 3838234762 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A state-space system is given by  $\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} -2 & -3 \\ 1 & 0 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 1 \\ 0 \end{bmatrix} u$  and  $y = \begin{bmatrix} 0 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$ . The controllability matrix  $[CM]$  is

**Options :**

1. ✖  $[CM] = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$
2. ✔  $[CM] = \begin{bmatrix} 1 & -2 \\ 0 & 1 \end{bmatrix}$



3. ✖  $[CM] = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

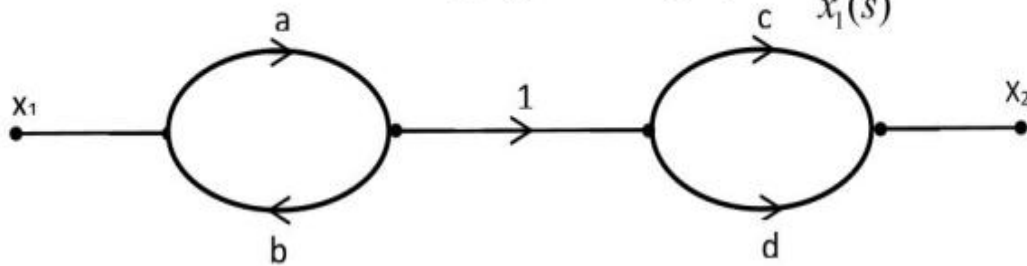
4. ✖  $[CM] = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$

Question Number : 83 Question Id : 3838234763 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

The transfer function of the following signal flow graph is  $\frac{x_2(s)}{x_1(s)}$



Options :

1. ✖  $\frac{(a-b)(c+d)}{1-ab}$

2. ✖  $\frac{ac+bc}{1-cd}$

3. ✔  $\frac{ac+ad}{1-ab}$

4. ✖  $\frac{(a-b)(c+d)}{1-cd}$

Question Number : 84 Question Id : 3838234764 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

The transfer function of a RLC series circuit when input voltage is fed to R & L and output voltage is at C is

Options :

1. ✖  $1/(s^2LC + sRL + 1)$

2. ✖  $1/(s^2RL + sLC + 1)$

3. ✖  $1/(s^2RC + sLC + 1)$

4. ✔  $1/(s^2LC + sRC + 1)$

**Question Number : 85 Question Id : 3838234765 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The following statements refer to the pole-zero configuration for compensator networks

- I. In lag network pole is nearer to origin
- II. In lead network zero is nearer to origin
- III. In lag network zero is nearer to origin
- IV. In lead network pole is nearer to origin

**Options :**

1. ✖ Only I is correct

2. ✖ Only III is correct

3. ✔ Only I & II are correct

4. ✖ Only III & IV are correct

**Question Number : 86 Question Id : 3838234766 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A 50 V reading in a 0 – 150 V range Voltmeter has an error of 1.25 V. Find the % error of full-scale reading.

**Options :**

1. ✔ 0.833 %

2. ✖ 1.25 %

3. ✖ 3.75 %

4. ✖ 1.875 %

**Question Number : 87 Question Id : 3838234767 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A  $4\frac{1}{2}$  digital voltmeter would display a reading of 0.6794 V in 10 V range as

**Options :**

1. ✖ 0.6790 V

2. ✔ 00.679 V

3. ✖ 0.6794 V

4. ✖ 000.67 V

**Question Number : 88 Question Id : 3838234768 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

With fixed dimensions of Cathode Ray Tube ( C.R.T.), the ratio of electrostatic deflection sensitivity to magnetic deflection sensitivity, if the accelerating voltage is 10 KV, is

**Options :**

1. ✖ 50 : 1

2. ✖ 1 : 50

3. ✔ 1 : 100

4. ✖ 100 : 1

**Question Number : 89 Question Id : 3838234769 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A dc ammeter has a multiplication factor of 8 and its shunt current is 17.5 A, then current through ammeter is

**Options :**

1. ✖ 1.875 A

2. ✖ 2.0 A

3. ✖ 1.94 A

4. ✔ 2.5 A

**Question Number : 90 Question Id : 3838234770 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A 200 V, 50 Hz, 1- $\phi$  energy meter makes 960 revolutions to supply a load at 0.8 p.f for 2 hrs.

If meter constant is 160 rev/kWh, then load current is

**Options :**

1. ✖ 1.875 A

2. ✖ 15 A

3. ✔ 18.75 A

4. ✖ 37.5 A

**Question Number : 91 Question Id : 3838234771 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

If  $I_m$ ,  $I_p$  and  $I_s$  are magnetising, primary and secondary currents of current transformer, then approximate phase angle  $\theta$  in degrees between  $I_p$  and reversed  $I_s$  is

**Options :**

1. ✖  $\theta = \frac{180}{\pi} \times \left( \frac{I_s}{I_p} \right)$

2. ✔  $\theta = \frac{180}{\pi} \times \left( \frac{I_m}{I_p} \right)$

3. ✖  $\theta = \frac{180}{\pi} \times \left( \frac{I_m}{I_s} \right)$

4. ✖  $\theta = \frac{180}{\pi} \times \left( \frac{I_p}{I_s} \right)$

Question Number : 92 Question Id : 3838234772 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

Match the following quantities of mechanical transducer with their operation

|     |            |       |                                  |
|-----|------------|-------|----------------------------------|
| (a) | Manometer  | (i)   | Force to displacement            |
| (b) | Hydrometer | (ii)  | Velocity to pressure             |
|     |            | (iii) | Specific gravity to displacement |
|     |            | (iv)  | Pressure to displacement         |

Options :

1. ✓ (a) – (iv); (b) – (iii)
2. ✗ (a) – (ii); (b) – (iii)
3. ✗ (a) – (iv); (b) – (ii)
4. ✗ (a) – (iv); (b) – (i)

Question Number : 93 Question Id : 3838234773 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

The output of a LVDT is 2 mV when core moves through a distance of 0.5 mm.  
The Sensitivity is

Options :

1. ✗ 0.25 mm/mV
2. ✓ 4 mV/mm
3. ✗ 0.25 mm/V
4. ✗ 4 mV/cm

Question Number : 94 Question Id : 3838234774 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

An analog transducer has a resolution of 0.01%. Calculate the number of bits required for A/D converter.

**Options :**

1. ✖ 10
2. ✖ 6
3. ✔ 14
4. ✖ 12

**Question Number : 95 Question Id : 3838234775 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A potentiometer is basically a

**Options :**

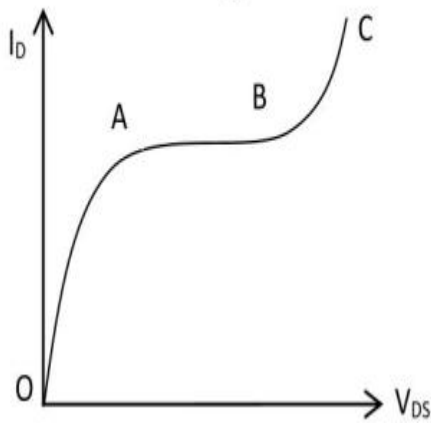
deflection type instrument and power consumed in the circuit of unknown source is ideally

1. ✖ zero
2. ✖ null type instrument and power consumed in the circuit of unknown source is high
3. ✖ deflection type instrument and power consumed in the circuit of unknown source is high
4. ✔ null type instrument and power consumed in the circuit of unknown source is ideally zero

**Question Number : 96 Question Id : 3838234776 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The V-I characteristic of a FET is shown below. For small signal amplification the device should be biased in the region



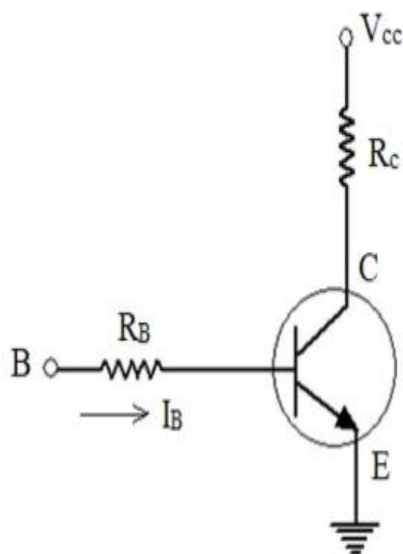
Options :

1. ✗ BC
2. ✗ OA
3. ✓ AB
4. ✗ AC

Question Number : 97 Question Id : 3838234777 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1

The base current of CE transistor in active region is  $15 \mu\text{A}$ , find  $V_{CE}$ , assuming  $\beta = 150$ ,  $R_C = 2 \text{ k}\Omega$  and  $V_{CC} = 12 \text{ V}$ .



Options :

1. ✗ 8.5 V



2. ✖ 9.0 V

3. ✖ 9.5 V

4. ✔ 7.5 V

Question Number : 98 Question Id : 3838234778 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

If an inverting Op-Amp with  $R_i = 50 \text{ k}\Omega$  and  $R_f = 200 \text{ k}\Omega$  is reconfigured as non-inverting Op-Amp, then its voltage gain is

Options :

1. ✖ 4 with phase inversion

2. ✔ 5 without phase inversion

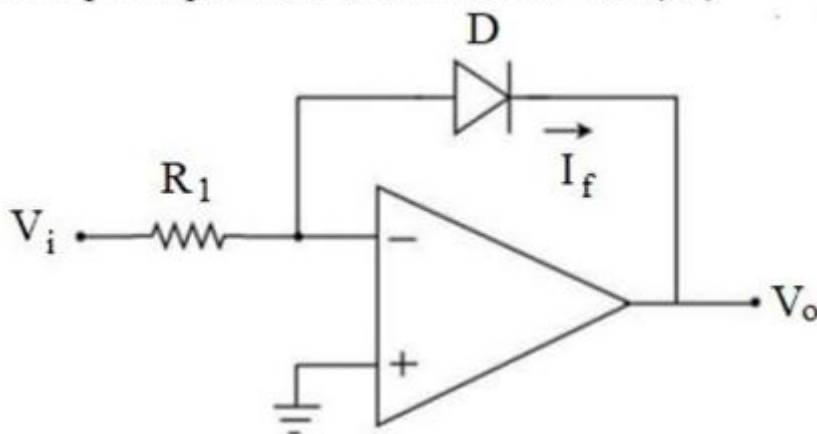
3. ✖ 5 with phase inversion

4. ✖ 4 without phase inversion

Question Number : 99 Question Id : 3838234779 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

The Op-Amp circuit shown below is a (an)



Options :

1. ✖ Anti-log amplifier

2. ✔ Logarithmic amplifier

3. ✖ Clamping circuit

4. ✖ Clipping circuit

Question Number : 100 Question Id : 3838234780 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

The depletion mode MOSFET is also known as

Options :

1. ✖ N-type MOSFET

2. ✖ P-type MOSFET

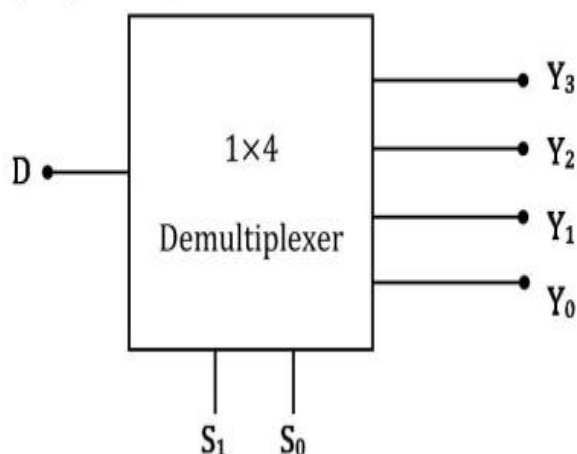
3. ✔ Normally-on MOSFET

4. ✖ Normally-off MOSFET

Question Number : 101 Question Id : 3838234781 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

When the enable data input  $D = 1$ , select inputs  $S_1 = 1$ ,  $S_0 = 0$  in the  $1 \times 4$  Demultiplexer then the outputs  $Y_0$ ,  $Y_1$ ,  $Y_2$ , and  $Y_3$  are



Options :

1. ✖  $Y_0 = 0$ ,  $Y_1 = 0$ ,  $Y_2 = 0$ ,  $Y_3 = 1$

2. ✔  $Y_0 = 0$ ,  $Y_1 = 0$ ,  $Y_2 = 1$ ,  $Y_3 = 0$

3. ✖  $Y_0 = 0$ ,  $Y_1 = 1$ ,  $Y_2 = 0$ ,  $Y_3 = 0$

4. ✖  $Y_0 = 1, Y_1 = 0, Y_2 = 0, Y_3 = 0$

**Question Number : 102 Question Id : 3838234782 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

For an 8-bit counter ramp A/D converter driven by 1000 kHz clock, calculate maximum conversion time.

**Options :**

1. ✖ 1.28 milli seconds

2. ✖ 0.128 milli seconds

3. ✔ 0.256 milli seconds

4. ✖ 2.56 milli seconds

**Question Number : 103 Question Id : 3838234783 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The input frequency of seven cascaded T flip-flops is 512 kHz. What is the time period of output?

**Options :**

1. ✖ 13.67  $\mu\text{s}$

2. ✔ 250  $\mu\text{s}$

3. ✖ 125  $\mu\text{s}$

4. ✖ 500  $\mu\text{s}$

**Question Number : 104 Question Id : 3838234784 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A  $4 \times 1$  Multiplexer consists of

**Options :**

1. ✖ 2 NAND & 4 NOT gates
2. ✖ 2 NOT & 4 NAND gates
3. ✖ 2 AND & 4 NOT gates
4. ✔ 2 NOT & 4 AND gates

**Question Number : 105 Question Id : 3838234785 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

In 8085  $\mu$ P, the NOP operation is

**Options :**

1. ✔ Machine control instruction
2. ✖ Branch instruction
3. ✖ Logical instruction
4. ✖ Arithmetic instruction

**Question Number : 106 Question Id : 3838234786 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A snubber circuit used for protection of a power diode consists of

**Options :**

1. ✔ Parallel Resistance and Capacitance in parallel with diode
2. ✖ Parallel Resistance and Capacitance in series with diode
3. ✖ Series Resistance and Capacitance in parallel with diode
4. ✖ Series Resistance and Capacitance in series with diode

**Question Number : 107 Question Id : 3838234787 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The sequence of devices in the order of decreasing frequency of operation are

**Options :**

1. ✖ GTO, MOSFET, IGBT
2. ✔ MOSFET, IGBT, GTO
3. ✖ GTO, IGBT, MOSFET
4. ✖ MOSFET, GTO, IGBT

**Question Number : 108 Question Id : 3838234788 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A 1- $\phi$  fully controlled bridge rectifier with a highly inductive load is fired at an angle of  $\cos^{-1}(0.8)$ . Assuming the load current is pure dc, the input power factor is

**Options :**

1. ✖ 0.64
2. ✔ 0.72
3. ✖ 0.80
4. ✖ 0.50

**Question Number : 109 Question Id : 3838234789 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The instantaneous voltage wave-form of a 3- $\phi$  fully controlled rectifier with R-L load is more negative and less positive when the firing angle ' $\alpha$ ' lies between

**Options :**

1. ✖  $150^\circ$  and  $180^\circ$
2. ✖  $60^\circ$  and  $90^\circ$
3. ✔  $90^\circ$  and  $120^\circ$

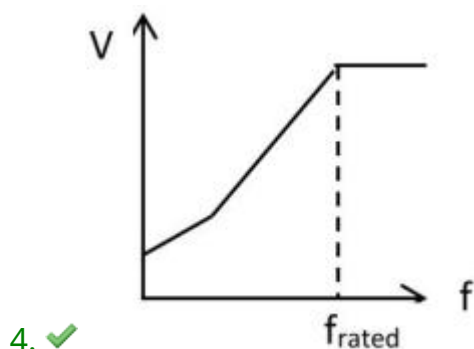
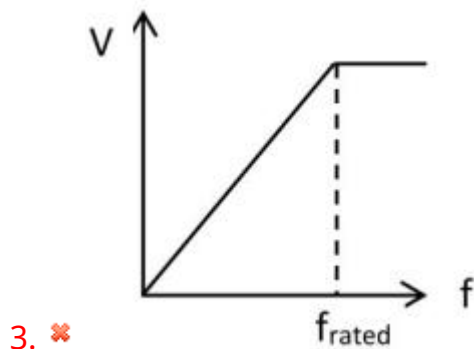
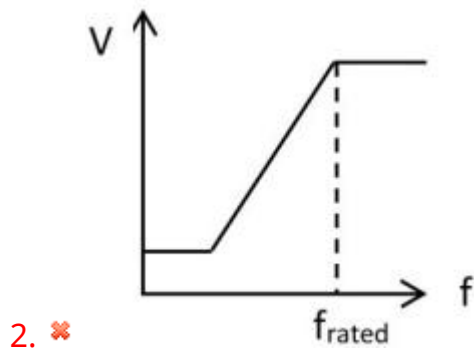
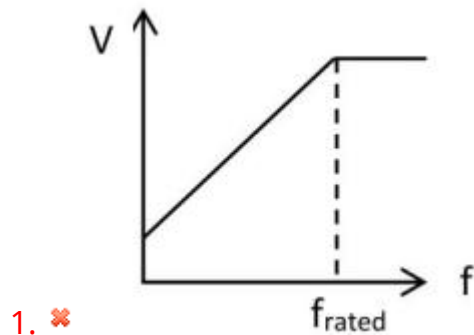
4. ✖ 120° and 150°

Question Number : 110 Question Id : 3838234790 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1

Choose the most correct *Voltage vs. Frequency* plot of a 3-phase variable speed Induction motor drive at constant flux operation

Options :



**Question Number : 111 Question Id : 3838234791 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Find rms value of output voltage of a 220 V input Type A chopper for a duty ratio of 0.25, assuming a voltage drop of 2 V across the chopper when it is on

**Options :**

1. ✓ 109 V
2. ✗ 110 V
3. ✗ 55 V
4. ✗ 54.5 V

**Question Number : 112 Question Id : 3838234792 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A 200 V separately excited dc motor is controlled by a 220 V, 50 Hz, 1- $\phi$  full-converter. What is the minimum firing angle when back emf equal to 190 V?

**Options :**

1. ✓  $\alpha = \sin^{-1} \left( \frac{19}{22\sqrt{2}} \right)$
2. ✗  $\alpha = \sin^{-1} \left( \frac{19}{20\sqrt{2}} \right)$
3. ✗  $\alpha = \sin^{-1} \left( \frac{10}{11\sqrt{2}} \right)$
4. ✗  $\alpha = \sin^{-1} \left( \frac{1}{\sqrt{2}} \right)$

**Question Number : 113 Question Id : 3838234793 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**



**Correct Marks : 1**

A 1- $\phi$  inverter is fed with a RLC series load of  $R = 1 \Omega$ ,  $X_L = 6 \Omega$  and  $X_C = 7 \Omega$ . Then the phase angle between third harmonic current and third harmonic voltage is

**Options :**

1. ✖  $-\tan^{-1}(18)$

2. ✔  $-\tan^{-1}\left(\frac{47}{3}\right)$

3. ✖  $+\tan^{-1}(18)$

4. ✖  $+\tan^{-1}\left(\frac{47}{3}\right)$

**Question Number : 114 Question Id : 3838234794 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A 1- $\phi$  AC voltage controller feeds a load resistance of  $R$ . If firing angles of two switches are  $0^\circ$  and  $180^\circ$ , then rms value of input current is

**Options :**

1. ✖ Equal to half the rms value of load current

2. ✖ Greater than rms value of load current

3. ✔ Equal to rms value of load current

4. ✖ Less than rms value of load current

**Question Number : 115 Question Id : 3838234795 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A 3- $\phi$  semi-converter drives a dc motor which runs at a rated speed of 1000 rpm at  $0^\circ$  firing angle. Find the speed of the motor when firing angle is  $60^\circ$ .

**Options :**

1. ✖ 866 rpm

2. ✖ 933 rpm

3. ✖ 1333 rpm

4. ✔ 750 rpm

**Question Number : 116 Question Id : 3838234796 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The ratio of latching current to holding current of SCR

**Options :**

1. ✔ is always more than one

2. ✖ always depends on gate current

3. ✖ is always less than one

4. ✖ is always equal to one

**Question Number : 117 Question Id : 3838234797 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Design minimum value of capacitance 'C' needed for a Buck converter with a frequency 'f' of 100 kHz so that ripple voltage  $V_R$  is less than 1% of output voltage  $V_O$ . Assume the duty ratio ' $\alpha$ ' is 0.6 and inductor 'L' equal to 25  $\mu$ H.

**Options :**

1. ✖ 60  $\mu$ F

2. ✔ 20  $\mu$ F

3. ✖ 40  $\mu$ F

4. ✖ 30  $\mu$ F

**Question Number : 118 Question Id : 3838234798 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1**

The frequency modulation of a 3- $\phi$  sinusoidal pulse width modulation is an odd multiple of 3. Then the output line voltage contains

**Options :**

1. ✖ 5<sup>th</sup>, 7<sup>th</sup>, 9<sup>th</sup>, 11<sup>th</sup>, ..... harmonics
2. ✖ 3<sup>rd</sup>, 5<sup>th</sup>, 7<sup>th</sup>, 9<sup>th</sup>, ..... harmonics
3. ✔ 5<sup>th</sup>, 7<sup>th</sup>, 11<sup>th</sup>, 13<sup>th</sup>, ..... harmonics
4. ✖ 3<sup>rd</sup>, 7<sup>th</sup>, 11<sup>th</sup>, 15<sup>th</sup>, ..... harmonics

**Question Number : 119 Question Id : 3838234799 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1**

Which of the following is not a feature of CSI fed ac motor drive?

**Options :**

1. ✖ Used in high power drives
2. ✖ Open loop control is not possible
3. ✖ Feed-back diodes are not required
4. ✔ Multi-motor operation is possible

**Question Number : 120 Question Id : 3838234800 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1**

Which of the following triggering circuits can be used in feed-back control systems?

**Options :**

1. ✔ UJT triggering circuit
2. ✖ R triggering circuit
3. ✖ RC half-wave triggering circuit

#### 4. ✖ RC full-wave triggering circuit