

## Lucknow Metro Rail Corporation Shift 1

### Notations :

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

**Question Paper Name:** Assistant Engineer Electrical Engineering Actual Final Shift 1  
**Subject Name:** Assistant Engineer Electrical Engineering  
**Duration:** 90

### Group 1

Group Maximum Duration : 0  
 Group Minimum Duration : 90  
 Revisit allowed for view? : No  
 Revisit allowed for edit? : No

Technical

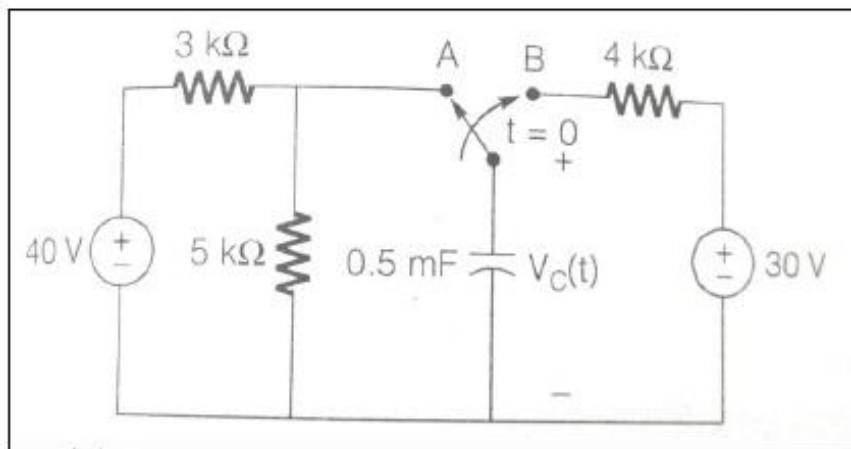
Mandatory or Optional:

Mandatory

**Question Number : 1 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

For the circuit shown in the figure below, the switch has been in the position A for a long time. At  $t = 0$ , the switch has moved to B. Then, the capacitor voltage  $V_c$  for  $t > 0$  is:



### Options :

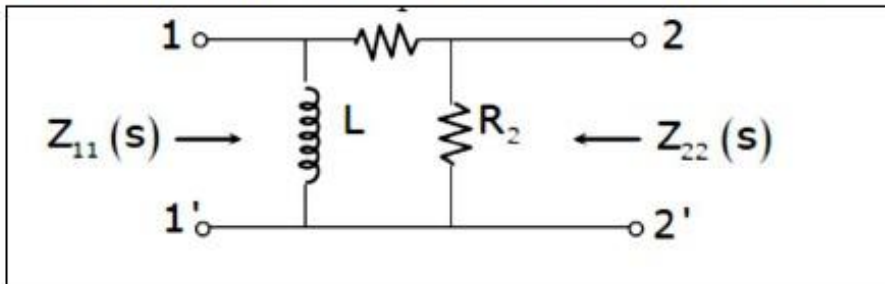
- ✗  $V_c(t) = (24 - 6e^{-2t})V$
- ✗  $V_c(t) = (30 - 15e^{-0.5t})V$
- ✗  $V_c(t) = (6 - 6e^{-2t})V$

4. ✓  $V_c(t) = (30 - 5e^{-0.5t})V$

Question Number : 2 Question Type : MCQ

Correct : 1 Wrong : 0.33

For the circuit shown below, the natural frequencies at port 2 are given by  $s + 2 = 0$  and  $s + 5 = 0$ , without knowing which refers to open circuit and which to short circuit. Then the impedances  $Z_{11}$  and  $Z_{22}$  are given respectively by:



Options :

1. ✗  $K_1 \frac{s+5}{s+2}, K_2 \frac{s+2}{s+5}$

2. ✗  $K_1 \frac{s+2}{s+5}, K_2 \frac{s+5}{s+2}$

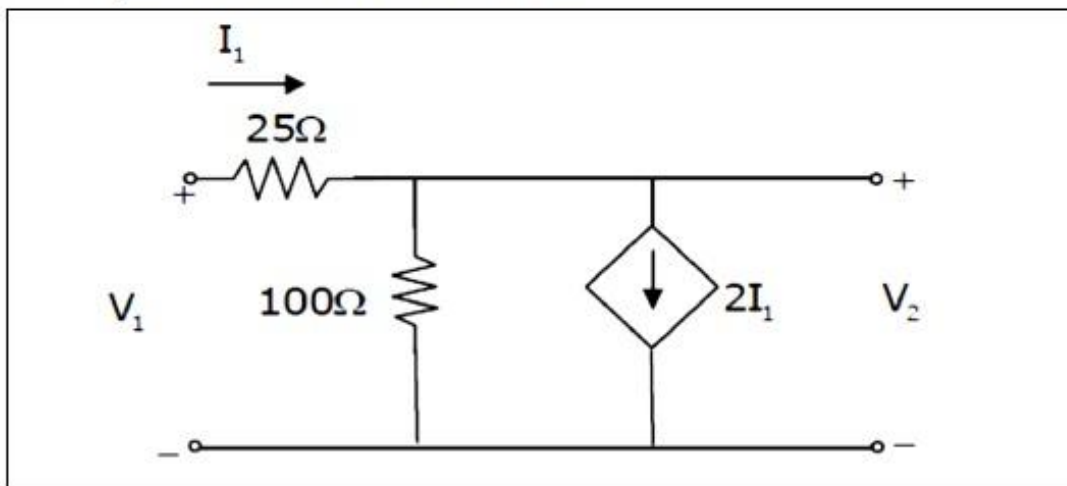
3. ✓  $K_1 \frac{s}{s+5}, K_2 \frac{s+2}{s+5}$

4. ✗  $K_1 \frac{s+2}{s+5}, K_2 \frac{s+2}{s+5}$

Question Number : 3 Question Type : MCQ

Correct : 1 Wrong : 0.33

The Y parameter of the network are:



Options :

1. ✗  $\begin{bmatrix} -0.04 & 0.04 \\ -0.04 & 0.03 \end{bmatrix}$

2. ✓  $\begin{bmatrix} 0.04 & -0.04 \\ 0.04 & -0.03 \end{bmatrix}$

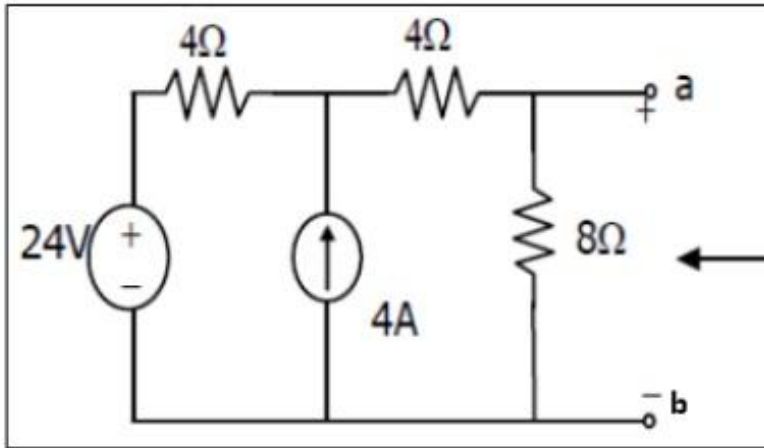
3. ✘  $\begin{bmatrix} 0.04 & -0.03 \\ -0.04 & 0.03 \end{bmatrix}$

4. ✘  $\begin{bmatrix} -0.04 & 0.03 \\ 0.04 & 0.03 \end{bmatrix}$

Question Number : 4 Question Type : MCQ

Correct : 1 Wrong : 0.33

Applying Norton's Theorem, the Norton's equivalent circuit to the left of the terminals "a" and "b" in the below circuit is having equivalent current source ( $I_N$ ) and equivalent resistance ( $R_N$ )



Options :

1. ✔ 5 Ampere, 4 Ohm
2. ✘ 4 Ampere, 6 Ohm
3. ✘ 9 Ampere, 1.6 Ohm
4. ✘ 4 Ampere, 3 Ohm

Question Number : 5 Question Type : MCQ

Correct : 1 Wrong : 0.33

For a perfect conductor, the field strength at a distance equal to the skin depth is X% of the field strength at its surface. The value X% is:

Options :

1. ✔ 0
2. ✘ 50
3. ✘ 36
4. ✘ 26

Question Number : 6 Question Type : MCQ

Correct : 1 Wrong : 0.33

When the air pocket is trapped inside a dielectric of relative permittivity "5", for a given applied voltage across the dielectric, the ratio of stress in the air pocket to that in the dielectric is equal to

Options :

1. ✘ 1/5
2. ✔ 5
3. ✘ 1 + 5

4. ✘ 5 - 1

Question Number : 7 Question Type : MCQ

Correct : 1 Wrong : 0.33

Point charges of  $-10 \text{ nC}$  and  $10 \text{ nC}$  are located in free space at  $(-1, 0, 0) \text{ m}$  and  $(1, 0, 0) \text{ m}$  respectively.

What is the energy stored in the field?

Options :

1. ✘ 0 nJ
2. ✘ 450 nJ
3. ✔ -450 nJ
4. ✘ -900 nJ

Question Number : 8 Question Type : MCQ

Correct : 1 Wrong : 0.33

A uniform plane wave has a wavelength of  $2 \text{ cm}$  in free space and  $1 \text{ cm}$  in a perfect dielectric. What is the relative permittivity of dielectric?

Options :

1. ✘ 2
2. ✘ 0.5
3. ✔ 4
4. ✘ 0.25

Question Number : 9 Question Type : MCQ

Correct : 1 Wrong : 0.33

The impulse response of a system is  $h(n) = a^n u(n)$ . The condition for the system to be BIBO stable is:

Options :

1. ✘  $a$  is real and positive
2. ✘  $a$  is real and negative
3. ✘  $[a] > 1$
4. ✔  $[a] < 1$

Question Number : 10 Question Type : MCQ

Correct : 1 Wrong : 0.33

The spectrum of  $x(n)$  extends from  $-\omega_0$  to  $+\omega_0$ , while that of  $h(n)$  extends from  $-2\omega_0$  to

$+2\omega_0$ . The spectrum  $y(n) = \sum_{k=-\infty}^{\infty} h(k)x(n-k)$  extends from:

Options :

1. ✘  $-4\omega_0$  to  $+4\omega_0$
2. ✘  $-3\omega_0$  to  $+3\omega_0$
3. ✘  $-2\omega_0$  to  $+2\omega_0$
4. ✔  $-\omega_0$  to  $+\omega_0$

Question Number : 11 Question Type : MCQ

Correct : 1 Wrong : 0.33

Let  $H(e^{j\omega})$  be the frequency response of a discrete time LTI system, and  $H_1(e^{j\omega})$  be the frequency response of its inverse. Then,

Options :

1.   $H(e^{j\omega}) H_1(e^{j\omega}) = 1$
2.   $H(e^{j\omega}) H_1(e^{j\omega}) = \delta(\omega)$
3.   $H(e^{j\omega}) * H_1(e^{j\omega}) = 1$
4.   $H(e^{j\omega}) * H_1(e^{j\omega}) = \delta(\omega)$

Question Number : 12 Question Type : MCQ

Correct : 1 Wrong : 0.33

What is the region of convergence of the z-transform of the signal  $2^n u(n) - 3^n u(-n - 1)$ ?

Options :

1.   $|z| > 1$
2.   $|z| < 1$
3.   $2 < |z| < 3$
4.  It does not exist.

Question Number : 13 Question Type : MCQ

Correct : 1 Wrong : 0.33

To obtain  $x(4 - 2n)$  from the given signal  $x(n)$ , the following precedence (or priority) rule is used for operations on the independent variable n:

Options :

1.  Time Scaling --- Time Shifting --- Reflection
2.  Reflection --- Time Scaling --- Time Shifting
3.  Time Scaling --- Reflection --- Time Shifting
4.  Time Shifting --- Time Scaling --- Reflection

Question Number : 14 Question Type : MCQ

Correct : 1 Wrong : 0.33

If  $R_1$  is the region of convergence of  $x(n)$  and  $R_2$  is the region of convergence of  $y(n)$ , then the region of convergence of  $x(n)$  convoluted  $y(n)$  is:

Options :

1.   $R_1 + R_2$
2.   $R_1 - R_2$
3.   $R_1 \cap R_2$
4.   $R_1 \cup R_2$

Question Number : 15 Question Type : MCQ

Correct : 1 Wrong : 0.33

A DC Shunt motor is running at 1200 rpm when excited with 220 V DC. Neglecting losses and saturation, what is the speed of the motor when connected to 175 V DC supply?

**Options :**

1. ✘ 750 rpm
2. ✘ 900 rpm
3. ✘ 1050 rpm
4. ✔ 1200 rpm

**Question Number : 16 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

A 240 V DC series motor takes 40 A when giving its rated output at 1500 rpm. Its resistance is 0.3 ohm. What is the value of resistance which must be added to obtain rated torque?

**Options :**

1. ✘ 6 ohms
2. ✘ 5.7 ohms
3. ✘ 2.2 ohms
4. ✔ 1.9 ohms

**Question Number : 17 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

A 200 V, 2000 rpm, 10 A, separately excited dc motor has an armature resistance of 2 ohms. Rated DC voltage is applied to both the armature and field winding of the motor. If the armature draws 5 A from the source, what is the torque developed by the motor?

**Options :**

1. ✔ 4.29 Nm
2. ✘ 5.0 Nm
3. ✘ 5.59 Nm
4. ✘ 6.0 Nm

**Question Number : 18 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

A 240 V DC shunt motor with an armature resistance of 0.5 ohm has a full load current of 40 A. What is the ratio of the stalling torque to the full load torque when a resistance of 1 ohm is connected in series with the armature?

**Options :**

1. ✔ 4
2. ✘ 12
3. ✘ 6
4. ✘ 14

**Question Number : 19 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

A 10 KVA, 400 V/200 V single phase transformer with 10 percent impedance draws a steady short circuit line current of:

**Options :**

1. ✘ 50 A
2. ✘ 150 A
3. ✔ 250 A
4. ✘ 350 A

**Question Number : 20 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

A 400 V/100 V, 10 KVA two winding transformer is reconnected as an auto transformer across a suitable voltage source. What could be the maximum rating of such an arrangement?

Options :

- 50 KVA
- 15 KVA
- 12.5 KVA
- 8.75 KVA

Question Number : 21 Question Type : MCQ

Correct : 1 Wrong : 0.33

When is an Autotransformer used in transmission and distribution?

Options :

- When operator is not available
- When iron losses are to be reduced
- When efficiency consideration can be ignored
- When transformation ratio is small

Question Number : 22 Question Type : MCQ

Correct : 1 Wrong : 0.33

A 50 Hz transformer having equally hysteresis and eddy current losses at the rated excitation is operated at 45 Hz at 90 percent of its rated voltage. Compared to rated operating point, the core losses under this condition:

Options :

- Reduced by 10 percent
- Reduced by 19 percent
- Reduced by 14.5 percent
- Remain unchanged

Question Number : 23 Question Type : MCQ

Correct : 1 Wrong : 0.33

When the supply voltage to an induction motor is reduced by 10 percent, the maximum torque will be decreased by approximately:

Options :

- 5%
- 10%
- 20%
- 40%

Question Number : 24 Question Type : MCQ

Correct : 1 Wrong : 0.33

A 3 phase 4 pole squirrel cage induction motor has 36 stator and 28 rotor slots. The number of phases in the rotor is:

Options :

- 3
- 9
- 7
- 8

Question Number : 25 Question Type : MCQ

Correct : 1 Wrong : 0.33

A 4 pole induction motor, supplied by a slightly unbalanced three phase 50 Hz source is rotating at 1440 rpm. What is the electrical frequency in Hz of the induced negative sequence current in the rotor?

Options :

1. ✘ 100
2. ✔ 98
3. ✘ 52
4. ✘ 48

Question Number : 26 Question Type : MCQ

Correct : 1 Wrong : 0.33

A 500 MW, 3 phase star connected synchronous generator has a rated voltage of 21.5 KV at 0.85 pf. What will be the line current when operating at full load rated conditions?

Options :

1. ✘ 13.43 KA
2. ✔ 15.79 KA
3. ✘ 23.25 KA
4. ✘ 27.36 KA

Question Number : 27 Question Type : MCQ

Correct : 1 Wrong : 0.33

In case of split phase motor, the phase shift between currents in the two windings is around

Options :

1. ✔ 30 degrees
2. ✘ 70 degrees
3. ✘ 90 degrees
4. ✘ 120 degrees

Question Number : 28 Question Type : MCQ

Correct : 1 Wrong : 0.33

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

Options :

1. ✔ 2 ohm
2. ✘ 4 ohm
3. ✘ 78 ohm
4. ✘ 156 ohm

Question Number : 29 Question Type : MCQ

Correct : 1 Wrong : 0.33

Keeping the excitation voltage the same, the load on the motor is increased such that the operating power factor will become:

Options :

1. ✔ .995 lagging
2. ✘ .995 leading
3. ✘ .791 lagging
4. ✘ .848 leading



Question Number : 30 Question Type : MCQ

Correct : 1 Wrong : 0.33

A single phase, 2000 V alternator has armature resistance and reactance of 0.8 ohms and 4.94 ohms respectively. The voltage regulation of the alternator at 100 A load at 0.8 leading power factor is

Options :

1. ✘ 7%
2. ✔ -8.0%
3. ✘ 14%
4. ✘ 0%

Question Number : 31 Question Type : MCQ

Correct : 1 Wrong : 0.33

For a fixed value of complex power flow in a transmission line having a sending end voltage  $V$ , the real power loss will be proportional to

Options :

1. ✘  $V$
2. ✘  $V^2$
3. ✔  $\frac{1}{V^2}$
4. ✘  $\frac{1}{V}$

Question Number : 32 Question Type : MCQ

Correct : 1 Wrong : 0.33

A loss less transmission line having surge impedance loading of 2280 MW is provided with a uniformly distributed series capacitive compensation of 30%. Then SIL of the compensated transmission line will be

Options :

1. ✘ 1835 MW
2. ✘ 2280 MW
3. ✔ 2725 MW
4. ✘ 3257 MW

Question Number : 33 Question Type : MCQ

Correct : 1 Wrong : 0.33

The corona loss on a particular system at 50 Hz is 1 KW/Km per phase. What is the corona loss at 60 Hz in KW/Km per phase?

Options :

1. ✘ 0.83
2. ✘ 1
3. ✔ 1.13
4. ✘ 1.2

Question Number : 34 Question Type : MCQ

Correct : 1 Wrong : 0.33

A shunt reactor of 100 MVAR is operated at 98% of its rated voltage and at 96% of its rated frequency. What is the reactive power absorbed by the reactor?

Options :

1. ✘ 98 MVAR

2. ✘ 104.02 MVAR

3. ✘ 96.04 MVAR

4. ✔ 100.04 MVAR

**Question Number : 35 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

At an industrial substation with a 4 MW load, a capacitor of 2 MVAR is installed to maintain the load power factor at 0.97 lagging. If the capacitor goes out of service, the load power factor becomes:

**Options :**

1. ✘ 0.85

2. ✘ 1

3. ✔ 0.80 lag

4. ✘ 0.90 lag

**Question Number : 36 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

In a three unit insulator string, voltage across lowest unit is 17.5 KV and lowest string efficiency is 84.28%. What is the total voltage across the string?

**Options :**

1. ✘ 8.825 KV

2. ✔ 44.25 KV

3. ✘ 88.25 KV

4. ✘ 442.5 KV

**Question Number : 37 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

The speed regulation parameter R of a control area is 0.025 Hz/MW and load frequency constant D is 2 MW/Hz. What is the area frequency response characteristic (AFRC)?

**Options :**

1. ✔ 42 MW/Hz

2. ✘ 40 MW/Hz

3. ✘ 20 Mw/Hz

4. ✘ 2 Mw/Hz

**Question Number : 38 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

An overhead line having a surge impedance of 400 ohms is connected in series with an underground cable having a surge impedance of 100 ohms. If the surge of 50 KV travels from the line towards the cable junctions, the value of transmitted voltage wave at the junction is:

**Options :**

1. ✘ 30 KV

2. ✔ 20 KV

3. ✘ 80 KV

4. ✘ -30 KV

**Question Number : 39 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

A cylindrical rotor generator delivers 0.5 pu power in the steady state to an infinite bus through a transmission line of reactance 0.5 pu. The generator no load voltage is 1.5 pu and the infinite bus voltage is 1 pu. The inertia constant of the generator is 5 MW-s/MVA and the generator reactance is 1 p.u. The critical clearing angle, in degrees, for a three phase dead short circuit fault at the generator terminal is:

Options :

- ✘ 53.5
- ✘ 60.2
- ✘ 70.8
- ✔ 79.6

Question Number : 40 Question Type : MCQ

Correct : 1 Wrong : 0.33

The neutral of 10 MVA, 11 KV alternator is earthed through a resistance of 5 ohms. The earth fault relay is set to operate at 0.75 A. The CTs have the ratio of 1000 : 5. What percentage of the alternator winding is protected?

Options :

- ✘ 85%
- ✔ 88.2%
- ✘ 15%
- ✘ 11.8%

Question Number : 41 Question Type : MCQ

Correct : 1 Wrong : 0.33

The per unit parameter for a 500 MVA machine on its own base are:

Inertia,  $M = 20$  p.u

Reactance,  $X = 2$  p.u

The per unit values of inertia and reactance on 100 MVA common base are respectively:

Options :

- ✘ 4 and 0.4
- ✘ 100 and 10
- ✘ 4 and 10
- ✔ 100 and 0.4

Question Number : 42 Question Type : MCQ

Correct : 1 Wrong : 0.33

A system is described by following equation

$$A = \begin{bmatrix} 0 & 1 \\ -3 & -6 \end{bmatrix}, B = \begin{bmatrix} 0 \\ 1 \end{bmatrix}, C = [ 1 \quad 1 ]$$

A steady state error due to step input is:

Options :

- ✔  $\frac{2}{3}$

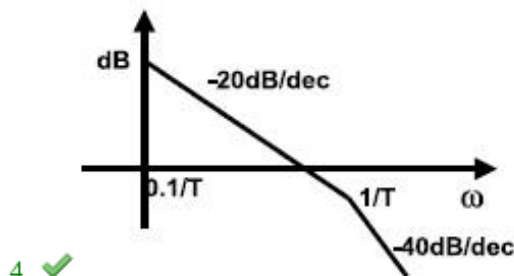
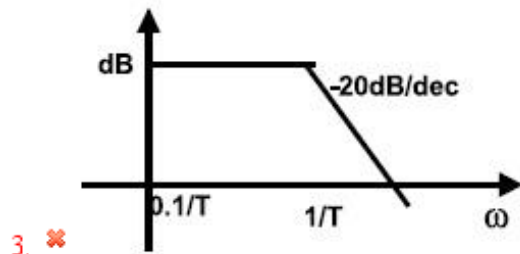
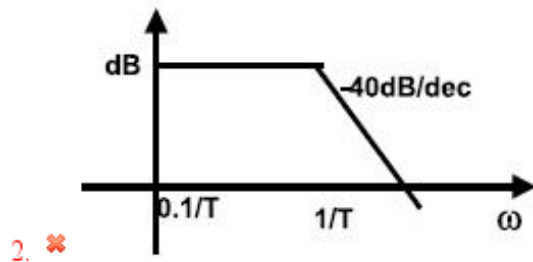
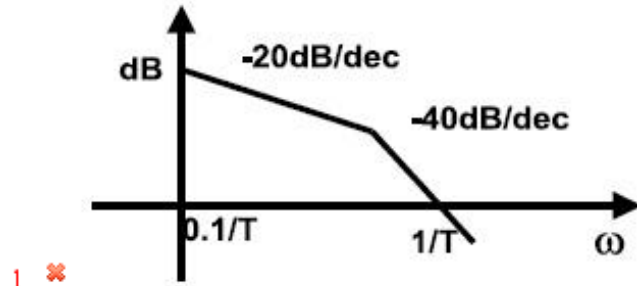
- 1.   $\frac{1}{3}$
- 2.   $\infty$
- 3.   $0$
- 4.   $0$

Question Number : 43 Question Type : MCQ

Correct : 1 Wrong : 0.33

The transfer function of a system is given by  $G(s) = \frac{K}{s(ST+1)}$ , where  $K \propto \frac{1}{T}$ . Which is the bode plot of this function?

Options :



Question Number : 44 Question Type : MCQ

Correct : 1 Wrong : 0.33

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

$$G(S) = \frac{aS+3}{s^2}$$

What is the value of 'a' for which the system will have a phase margin of 45°?

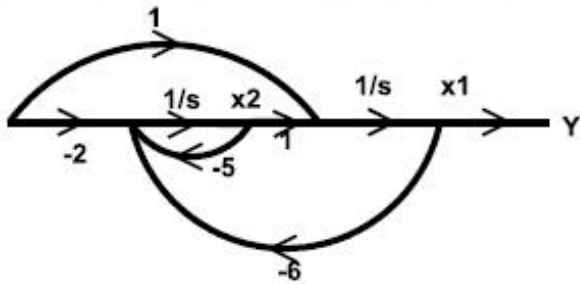
Options :

1. ✘  $\frac{\sqrt{2}}{\sqrt{3}}$
2. ✘  $\frac{\sqrt{\sqrt{2}}}{\sqrt{3}}$
3. ✘  $\frac{1}{\sqrt{\sqrt{2}}}$
4. ✔  $\frac{\sqrt{3}}{\sqrt{\sqrt{2}}}$

Question Number : 45 Question Type : MCQ

Correct : 1 Wrong : 0.33

Consider the system shown below



Which of the following is correct about controllability and observability of the system?

Options :

1. ✘ Controllable but not observable
2. ✔ Not controllable but observable
3. ✘ Not controllable and not observable
4. ✘ Controllable and also observable

Question Number : 46 Question Type : MCQ

Correct : 1 Wrong : 0.33

The characteristic equation  $2s^4 + s^3 + 3s^2 + 5s + 10 = 0$  has \_\_\_\_\_ roots in left half.

Options :

1. ✘ 0
2. ✘ 1
3. ✔ 2
4. ✘ 3

Question Number : 47 Question Type : MCQ

Correct : 1 Wrong : 0.33

Which of the following effects in the system is not caused by negative feedback?

Options :

1. ✘ Reduction in gain
2. ✘ Increase in bandwidth
3. ✔ Increase in distortion
4. ✘ Reduction in output impedance

Question Number : 48 Question Type : MCQ

Correct : 1 Wrong : 0.33

The transfer function of a system is  $\frac{1-s}{1+s}$ . The system is a:

Options :

- non minimum phase system
- minimum phase system
- low pass system
- second order system

Question Number : 49 Question Type : MCQ

Correct : 1 Wrong : 0.33

The Open loop transfer function of a unity feedback system is given by  $G(s) = (e^{-0.1s})/s$ . The gain margin of the system in dB is:

Options :

- $1/5\pi$
- $5\pi$
- 23.9
- 11.95

Question Number : 50 Question Type : MCQ

Correct : 1 Wrong : 0.33

Which one of the following transfer functions will have the greatest Maximum Overshoot?

Options :

- $\frac{9}{s^2+s+9}$
- $\frac{16}{s^2+s+16}$
- $\frac{25}{s^2+s+25}$
- $\frac{36}{s^2+s+36}$

Question Number : 51 Question Type : MCQ

Correct : 1 Wrong : 0.33

Integrating principle in the digital measurement is the conversion of

Options :

- Voltage to time
- Voltage to frequency
- Voltage to current
- Current to voltage

Question Number : 52 Question Type : MCQ

Correct : 1 Wrong : 0.33

A rectifier instrument is used to measure an alternating square wave of amplitude 100 V. What is the meter reading?

Options :

- 100 V

2. ✓ 70.7 V

3. ✗ 111 V

4. ✗ 50 V

**Question Number : 53 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

A frequency counter needs to measure a frequency of 15 Hz. Its signal gating time is 2 s. What is the percentage accuracy of the counter, taking into account the gating error?

**Options :**

1. ✗ 3.33%

2. ✗ 13.33%

3. ✗ 98.67%

4. ✓ 96.67%

**Question Number : 54 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

A spring controlled moving iron voltmeter draws a current of 1 mA for full scale value of 100 V. If it draws a current of 0.5 mA, what is the meter reading?

**Options :**

1. ✓ 25 V

2. ✗ 50 V

3. ✗ 100 V

4. ✗ 200 V

**Question Number : 55 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

A 0-100 V voltmeter has an accuracy of one percent at full scale reading. What will be the error if it reads 50 V?

**Options :**

1. ✗ 1 percent

2. ✓ 2 percent

3. ✗ 0.5 percent

4. ✗ 4 percent

**Question Number : 56 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

In the two wattmeter method of measuring 3 phase power, the wattmeters indicated equal and opposite readings when load power factor is:

**Options :**

1. ✗ 90 leading

2. ✓ 90 lagging

3. ✗ 30 leading

4. ✗ 30 lagging

**Question Number : 57 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

What is the approximate impedance of a CRO?

**Options :**

1. ✘ 0
2. ✔ 1 Mega Ohm
3. ✘ 10 Ohm
4. ✘ 10 Tera Ohm

Question Number : 58 Question Type : MCQ

Correct : 1 Wrong : 0.33

For defining the standard meter, wavelength of which material is considered?

Options :

1. ✘ Neon
2. ✔ Krypton
3. ✘ Helium
4. ✘ Xenon

Question Number : 59 Question Type : MCQ

Correct : 1 Wrong : 0.33

The deflecting torque of an Ammeter is directly proportional to the current passing through it and the instrument has full scale deflection of 90 degree for a current of 10 A. What deflection will occur for a current of 5 A when the instrument has gravity control?

Options :

1. ✔ 30 degree
2. ✘ 45 degree
3. ✘ 60 degree
4. ✘ 90 degree

Question Number : 60 Question Type : MCQ

Correct : 1 Wrong : 0.33

The inductance of certain moving iron instrument is  $L = (8 + 4\alpha - 0.5\alpha^2) \mu\text{H}$ , where  $\alpha$  is the deflection in radian from 0 position. If the control spring torque is  $12 \mu\text{N-m/radian}$ , the scale in position in radian for a current of 2 A is:

Options :

1. ✘ 1.75 radian
2. ✔ 0.57 radian
3. ✘ 0.21 radian
4. ✘ 0.8 radian

Question Number : 61 Question Type : MCQ

Correct : 1 Wrong : 0.33

What is the reverse recovery time of a diode when switched from forward bias  $V_f$  to reverse bias  $V_R$ ?

Options :

1. ✘ Time taken to remove the stored minority carriers
2. ✘ Time taken by the diode voltage to attain zero value
3. ✔ Time to remove stored minority carriers plus the time to bring the diode voltage to reverse bias  $V_R$



4. ✘ Time taken by the diode current to reverse

Question Number : 62 Question Type : MCQ

Correct : 1 Wrong : 0.33

In a single phase full wave controlled bridge rectifier, minimum output voltage and maximum output voltage are obtained at which conduction angles (in degrees)?

Options :

1. ✘ 0 and 180 respectively
2. ✔ 180 and 0 respectively
3. ✘ 0 and 0 respectively
4. ✘ 180 and 180 respectively

Question Number : 63 Question Type : MCQ

Correct : 1 Wrong : 0.33

The maximum junction temperature of a transistor is  $150^{\circ}\text{C}$  and the ambient temperature is  $25^{\circ}\text{C}$ . If the total thermal impedance is  $1^{\circ}\text{C/W}$ , what is the maximum power dissipation?

Options :

1. ✘  $\frac{1}{175}\text{W}$
2. ✘ 175 W
3. ✔ 125 W
4. ✘  $\frac{1}{125}\text{W}$

Question Number : 64 Question Type : MCQ

Correct : 1 Wrong : 0.33

Two MOSFETS M1 and M2 are connected in parallel to carry a total current of 20 A. The drain to source voltage of M1 is 2.5 V and that of M2 is 3 V. What are the drain currents of M1 and M2 when the current sharing series resistances are each of 0.5 ohms?

Options :

1. ✔ 10.5 A and 9.5 A
2. ✘ 9.5 A and 10.5 A
3. ✘ 10.5 A and 10.5 A
4. ✘ 9.5 A and 9.5 A

Question Number : 65 Question Type : MCQ

Correct : 1 Wrong : 0.33

An amplifier circuit has an overall current gain of -100 and the input resistance of 10 Kilo ohm with a load resistance of 1 Kilo ohm. The overall voltage gain of the amplifier is:

Options :

1. ✘ 5 dB
2. ✘ 10 dB
3. ✔ 20 dB
4. ✘ 40 dB

Question Number : 66 Question Type : MCQ

**Correct : 1 Wrong : 0.33**

The reduced state table of a sequential machine has 7 rows. What is the minimum number of flip flops needed to implement the machine?

**Options :**

1. ✘ 0
2. ✘ 2
3. ✔ 3
4. ✘ 7

**Question Number : 67 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

A 4-bit-16 ripple counter uses J-K flip-flop. If the propagation delay of each flip-flop is 50 nanoseconds, the maximum clock frequency that can be used is equal to:

**Options :**

1. ✘ 20 MHz
2. ✘ 10 MHz
3. ✘ 8 MHz
4. ✔ 5 MHz

**Question Number : 68 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

The power gain of an antenna using parabolic reflector is directly proportional to the:

**Options :**

1. ✘ mouth diameter
2. ✘ wavelength
3. ✘ aperture ratio
4. ✔ square of the aperture ratio

**Question Number : 69 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

In a power circuit of 3 KV, four thyristors each of rating 800 V are connected in series. What is the percentage series derating factor?

**Options :**

1. ✘ 50
2. ✘ 25
3. ✘ 12.5
4. ✔ 6.25

**Question Number : 70 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

What is the maximum output voltage of a 3 -phase bridge rectifier supplied with a line voltage of 440 V?

**Options :**

1. ✘ 528 V
2. ✘ 396 V
3. ✔ 594 V
4. ✘ 616 V

**Question Number : 71 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

A DC chopper is used in regenerative braking mode of a dc series motor. The DC supply is 600 V, the duty cycle is 70 percent. The average value of armature current is 100 A. It is continuous and ripple free. What is the value of power feedback to the supply?

**Options :**

1. ✘ 3 kW
2. ✘ 9 kW
3. ✔ 18 kW
4. ✘ 35 kW

**Question Number : 72 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

For elimination of 5th harmonic from the output of an inverter, what will be the position of pulse in a PWM inverter?

**Options :**

1. ✔ 72 degree
2. ✘ 36 degree
3. ✘ 60 degree
4. ✘ 90 degree

**Question Number : 73 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

What is the most suitable solid state converter for controlling the speed of the three phase cage motor at 25 Hz?

**Options :**

1. ✔ Cycloconverter
2. ✘ Current source inverter
3. ✘ Voltage source inverter
4. ✘ Load commutated inverter

**Question Number : 74 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

In buck boost converter, what is the maximum value of switch utilization factor?

**Options :**

1. ✘ 1
2. ✔ 0.75
3. ✘ 0.5
4. ✘ 0.25

**Question Number : 75 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

A solar cell of 350 V is feeding power to an ac supply of 440 V, 50 Hz through a 3 phase fully controlled bridge converter. A large inductance is connected in the dc circuit to maintain the dc current at 20 A. If the solar cell resistance is 0.5 ohm, then each thyristor will be reversed biased for a period of:

**Options :**

1. ✘ 125°
2. ✘ 120°
3. ✘ 60°

4. ✓ 55°

Numerical and logical Reasoning questions

Mandatory or Optional:

Mandatory

Question Number : 76 Question Type : MCQ

Correct : 1 Wrong : 0.33

Find out the word-pair in which the two words hold the same relationship as the two words in the word-pair given below.

Flower : Jasmine

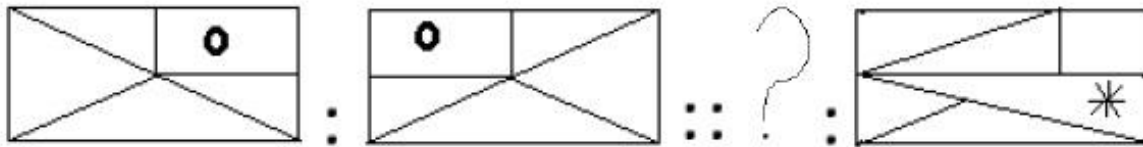
Options :

- ✗ River : Water
- ✓ Religion : Christianity
- ✗ Temple : Deity
- ✗ School : Teaching

Question Number : 77 Question Type : MCQ

Correct : 1 Wrong : 0.33

The first two figures on the left side of the sign '::' are related in a certain way. The same relationship holds for the second pair of figures on the right side of the sign '::', of which one is missing. Which of the following is the missing one?



Options :

- ✗
- ✗
- ✓
- ✗

Question Number : 78 Question Type : MCQ

Correct : 1 Wrong : 0.33

Which number will replace the question mark in the number series below?

3648, 3684, 3468, 3486, ? , 3846

Options :

- ✘ 3684
- ✘ 8364
- ✘ 3468
- ✔ 3864

Question Number : 79 Question Type : MCQ

Correct : 1 Wrong : 0.33

A car covers the distance from A to B in 13 hours and 30 minutes. If the car covers the first half of the distance at the rate of 20 km/hr and the second half at the rate of 25 km/hr, what is the distance from A to B?

Options :

- ✘ 240 km
- ✘ 260 km
- ✔ 300 km
- ✘ 330 km

Question Number : 80 Question Type : MCQ

Correct : 1 Wrong : 0.33

A's mother is the sister of B and the daughter of C. D is the daughter of B. If E is the wife of C, then which of the following is true?

Options :

- ✔ E is the grandmother of D
- ✘ D is the brother of A
- ✘ C is the uncle of D
- ✘ E is the aunt of B

Question Number : 81 Question Type : MCQ

Correct : 1 Wrong : 0.33

Four words are given below out of which three are alike in some manner and one is different. Which of the given words is different from the other three?

Options :

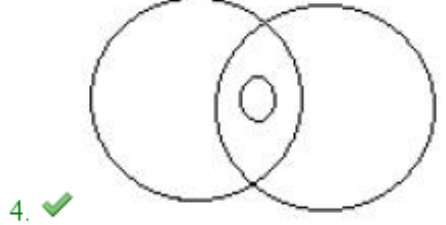
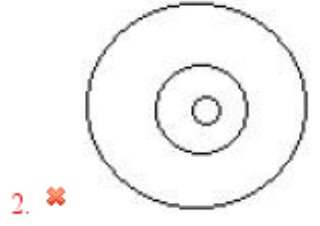
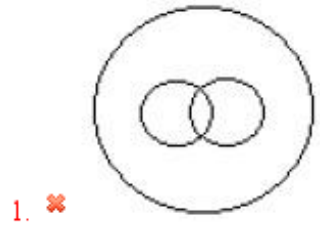
- ✔ Triangle
- ✘ Square
- ✘ Rectangle
- ✘ Rhombus

Question Number : 82 Question Type : MCQ

Correct : 1 Wrong : 0.33

Four figures are given below out of which three are similar in a certain way and one is different. Which of the given figures is different from the other three?

Options :



Question Number : 83 Question Type : MCQ

Correct : 1 Wrong : 0.33

In a class of 35 students, 2 speak English and Hindi, 3 speak English and Telugu, and 5 speak Hindi and Telugu. If 4 students speak all three languages, how many students speak only one language?

Options :

- 1. ✘ 11
- 2. ✘ 20
- 3. ✔ 21
- 4. ✘ 25

Question Number : 84 Question Type : MCQ

Correct : 1 Wrong : 0.33

If 'INSTRUMENT' is written as 'HOTSQTNFOU' in a certain language, then how would 'MULTIPLIER' be written in the language?

Options :

- 1. ✘ LVMSHOMHCQ
- 2. ✔ LVMSHOMJFS
- 3. ✘ NTKUJQKHDS
- 4. ✘ LVMSHOMJFQ

Question Number : 85 Question Type : MCQ

Correct : 1 Wrong : 0.33

Each of the following two rows contains 3 numbers. Some rules are given below to be used for getting the resultant for each row separately. Apply the rules for each row from left to right and answer the question.

*Rules:*

- (i) If an even number is followed by an odd but not prime number, both are to be multiplied.
- (ii) If an even number is followed by a prime number, both are to be added.
- (iii) If an odd number is followed by a composite odd number, the first number is to be subtracted from the square of the second number.
- (iv) If an odd number is followed by an even number, the odd one is to be subtracted from the even number.

Row I: 19, 54, 15

Row II: 12, 21, 31

What is the difference between the resultants of the first row and the second row?

**Options :**

1. ✖ 190
2. ✖ 259
3. ✖ 103
4. ✔ 93

Computer Applications

Mandatory or Optional:

Mandatory

**Question Number : 86 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

Which of the following simplifies the use of system software?

**Options :**

1. ✖ Spreadsheet
2. ✖ Operating System
3. ✖ Multitasking
4. ✔ Timesharing

**Question Number : 87 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

The output quality of a printer is measured by:

**Options :**

1. ✖ Dots per inch
2. ✔ Dots per square inch
3. ✖ Dots printed in record time
4. ✖ Pixels printed per record time

Question Number : 88 Question Type : MCQ

Correct : 1 Wrong : 0.33

Which of the following is not an input device?

Options :

1.  Wi Fi
2.  Game pad
3.  Trackball
4.  MIDI keyboard

Question Number : 89 Question Type : MCQ

Correct : 1 Wrong : 0.33

Translator for low level programming language is called:

Options :

1.  Assembler
2.  Compiler
3.  Linker
4.  Loader

Question Number : 90 Question Type : MCQ

Correct : 1 Wrong : 0.33

Which type of software supports communication, collaboration and coordination at the same time?

Options :

1.  SCM software
2.  E-business software
3.  CRM software
4.  Groupware

Question Number : 91 Question Type : MCQ

Correct : 1 Wrong : 0.33

Which of the following decimal numbers is equivalent to the binary number  $(1011112)_2$ ?

Options :

1.   $27_{10}$
2.   $33_{10}$
3.   $54_{10}$
4.   $47_{10}$

Question Number : 92 Question Type : MCQ

Correct : 1 Wrong : 0.33

Bookmarks are used to:

Options :

1.  add anchors to web pages
2.  mark the end of a paragraph or a document
3.  jump to specific location in a document
4.  add hyperlinks to web pages



**Question Number : 93 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

If an Excel file is inserted into a Word document, the data is:

**Options :**

1. ✘ hyperlinked
2. ✔ placed in Word table
3. ✘ linked
4. ✘ embedded

**Question Number : 94 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

OSI stands for:

**Options :**

1. ✘ Open System Interface
2. ✘ Out System Interface
3. ✔ Open System Interconnection
4. ✘ Out System Interconnection

**Question Number : 95 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

The web site of a company is hosted on a:

**Options :**

1. ✘ Web infrastructure
2. ✔ Web server
3. ✘ Web page
4. ✘ Web client

General Knowledge/ Awareness

Mandatory or Optional:

Mandatory

**Question Number : 96 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

Which of the following Indian rulers fought with Alexander?

**Options :**

1. ✘ Ambhi
2. ✘ Skand Gupta
3. ✘ Samudragupta
4. ✔ Porus

**Question Number : 97 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

Which Article under Constitution of India is dealing with recruitment, conditions of service of person serving the Union or State?

**Options :**

1. ✘ Article 302

2. ✓ Article 309

3. ✗ Article 315

4. ✗ Article 321

**Question Number : 98 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

Which of the following rates, is not decided by the Reserve Bank of India?

**Options :**

1. ✗ Bank Rate

2. ✓ Income Tax Rate

3. ✗ Repo Rate

4. ✗ Reverse Repo Rate

**Question Number : 99 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

Which is the first National Park established in India?

**Options :**

1. ✗ Kanha National Park

2. ✗ Bandipur National Park

3. ✓ Corbett National Park

4. ✗ Periyar National Park

**Question Number : 100 Question Type : MCQ**

**Correct : 1 Wrong : 0.33**

Which instrument is used to record earthquake?

**Options :**

1. ✗ Magnetic Compass

2. ✓ Seismograph

3. ✗ Sonometer

4. ✗ Spectograph