TCSiON CAE

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 :	PC22122ELECTRICALANDELECTRONICSENGINEERINGAEE2212 08th May 2023 Shift 2
Subject Name :	PC22122 ELECTRICAL AND ELECTRONICS ENGINEERING AEE2212
Actual Answer Key :	Yes
Calculator :	None
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	No
Show Watermark on Console? :	Yes
Highlighter :	No
Auto Save on Console?	Yes
Change Font Color :	No
Change Background Color :	No
Change Theme :	No
Help Button :	No
Show Reports :	No
Show Progress Bar :	No
Is this Group for Examiner? :	No

Question Number : 1 Question Id : 630680217592 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A meter shows 118.35 V, the true voltage is 118.73 V. Determine the static error.

Options :

1. ✖ 0.67 V

2. ✖ −0.07 V

3. ✔ −0.38 V

4. ✖ 0.78 V

Question Number : 2 Question Id : 630680217593 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A thermometer's range of calibration is 130°C to 230°C. The precision is defined as being within ±0.35 percent of the instruments range. What is the maximum static error?

Options :

1. ✖ ±0.01°C

2. ✖ ±0.05°C

3. ✖ ±0.15°C

4. ✔ ±0.35°C

Question Number : 3 Question Id : 630680217594 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The reading range of a digital voltmeter is from 0 to 9988 counts. When the full scale reading is 9.988 V, then determine the resolution of the instrument in volts.

Options :

1. ✖ 10^{-1} V

2. ✖ 10^{-2} V

3. ✔ 10^{-3} V

4. ✖ 10^{-4} V

Question Number : 4 Question Id : 630680217595 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The guaranteed accuracy of a 0-200 V voltmeter is 1 percent of the full scale reading. The instrument measures 40 Volts. Calculate the percentage limiting error.

Options :

1. ✖ 1 percent

2. ✖ 2 percent

3. ✔ 5 percent

4. ✖ 8 percent

Question Number : 5 Question Id : 630680217596 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The manufacturer specified the inductance of an inductor as 5 mH ± 3 percent. Determine the limits within which the inductance value is guaranteed.

Options :

1. ✖ 4.5 to 5.5 mH

2. ✔ 4.85 to 5.15 mH

3. ✖ 3.5 to 5.8 mH

4. ✖ 3.85 to 5.15 mH

Question Number : 6 Question Id : 630680217597 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Find the multiplying power of a shunt of 200 Ω resistance used with a galvanometer of 1600 Ω resistance and determine the value of shunt resistance to give a multiplying power of 80.

Options :

1. ✖ 2, 10.2 Ω

2. ✖ 6, 52.5 Ω

3. ✔ 9, 20.2 Ω

4. ✖ 15, 18.5 Ω

Question Number : 7 Question Id : 630680217598 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Six students adjusted a circuit for resonance and the resonant frequency in KHz was measured as 435, 487, 453, 428, 450 and 415. What will be the arithmetic mean of the given frequencies?

Options :

1. ✖ 526.32 KHz

2. ✖ 482.57 KHz

3. ✔ 444.67 KHz

4. ✖ 424.82 KHz

Question Number : 8 Question Id : 630680217599 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct?

I. The simplest possible measure of dispersion is the range which is the difference between greatest and least values of data.

II. The variance is the mean square deviation, which is not same as standard deviation, except that square root is not extracted.

Options :

1. ✔ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✖ Neither I nor II

Question Number : 9 Question Id : 630680217600 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding standard deviation?

I. The standard deviation of the mean is given by : $\sigma_m = \dfrac{\sigma}{\sqrt{2n}}$

II. For multiple sample data, the standard deviation of the standard deviation is : $\sigma_\sigma = \dfrac{\sigma_m}{\sqrt{2}}$

Options :

1. ✖ Only I

2. ✔ Only II

3. ✖ Both I and II

4. ✖ Neither I nor II

Question Number : 10 Question Id : 630680217601 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements regarding the measuring instruments is correct?

I. PMMC meter is used for measurement of A.C. voltage only.

II. Thermocouple is majorly used for measurement of Radio frequency A.C. signals.

III. Rectifier is widely used for medium sensitivity service type voltage measurements in medium impedance circuits.

Options :

1. ✖ I, II and III

2. ✖ I and II only
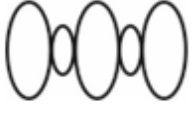
3. ✅ II and III only

4. ❌ I and III only

Question Number : 11 Question Id : 630680217602 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements regarding a Cathode Ray Oscilloscope (CRO) is correct?

I. The deflection sensitivity of a Cathode Ray Tube (CRT) is defined as the deflection of the screen per unit deflection voltage.

II. The graticule is a grid of lines that serves as a scale when making time and amplitude measurements.

III. Isolation probe is used in order to avoid the undesirable circuit loading effects of the shielded probe.

Options :

1. ❌ I and II only

2. ❌ II and III only

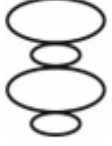3. ❌ I and III only

4. ✅ I, II and III

Question Number : 12 Question Id : 630680217603 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following Lissajous patterns with their respective frequency ratio.

	Lissajous patterns		Frequency ratio
I		1	$f_v = \dfrac{2}{3} f_h$
II		2	$f_v = 5 f_h$
III		3	$f_v = \dfrac{1}{4} f_h$

Options :

1. ✖ I-1, II-2, III-3

2. ✖ I-2, II-1, III-3

3. ✔ I-2, II-3, III-1

4. ✖ I-3, II-1, III-2

Question Number : 13 Question Id : 630680217604 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following pair of 'Meter type – Major uses' is correct?

I. Moving iron – Widely used in indicator type application

II. Electrostatic – Most widely used meter for D.C. current and voltage and resistance measurement in low and medium impedance

III. Electrodynamometer – Widely used for precise A.C. current and voltage measurement at power frequencies

Options :

1. ✖ I and II only

2. ✔ I and III only

3. ✖ II and III only

4. ✖ I, II and III

Question Number : 14 Question Id : 630680217605 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following in increasing order, according to their Q factor.

I. Maxwell's bridge

II. Hay's bridge

III. Anderson's Bridge

Options :

1. ✖ I, III, II

2. ✖ II, III, I

3. ✓ III, I, II

4. ✗ I, II, III

Question Number : 15 Question Id : 630680217606 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following parts of Cathode Ray Tube (CRT) in correct logical order, start viewing from Pins side.

I. Heater

II. Grid

III. Focusing anode

IV. Accelerating anode

V. Cathode

Options :

1. ✗ V, I, II,IV, III

2. ✗ II, III, V, I, IV

3. ✓ I, V, II, III, IV

4. ✗ III, IV, V, I, II

Question Number : 16 Question Id : 630680217607 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Convert $(152.2)_8$ to decimal number.

Options :

1. ✔ $(106.25)_{10}$

2. ✘ $(152.2)_{10}$

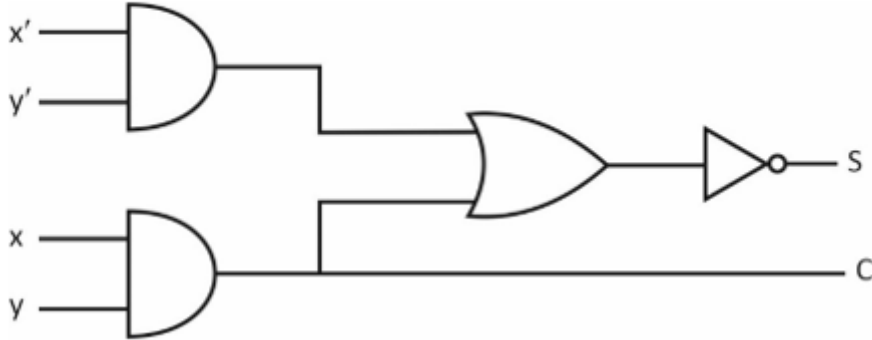3. ✘ $(214.52)_{10}$

4. ✘ $(384.2)_{10}$

Question Number : 17 Question Id : 630680217608 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Simplify the following Boolean function.

$F = \bar{A}\bar{B}C + ABC + \bar{A}BC + A\bar{B}C$

Options :

1. ✘ $A\bar{B}C$

2. ✘ $\bar{A} + BC$

3. ✘ AC

4. ✔ C

Question Number : 18 Question Id : 630680217609 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Find the sum (S) and carry (C) of the following logic diagram.

Options :

1. ✖ $S = x + y$
   $C = xy'$

2. ✖ $S = x'y + xy'$
   $C = xy'$

3. ✔ $S = (xy + x'y')'$
   $C = xy$

4. ✖ $S = x + y$
   $C = xy$

Question Number : 19 Question Id : 630680217610 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the given flip flop characteristic table.

X	Y	Q(t + 1)
0	0	Q(t)
0	1	0
1	0	1
1	1	Q't

Options :

1. ✖ SR flip flop

2. ✔ JK flip flop

3. ✖ D flip flop

4. ✖ T flip flop

Question Number : 20 Question Id : 630680217611 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Convert $(123)_{10}$ to hexadecimal number.

Options :

1. ✖ 8A

2. ✖ 6C

3. ✔ 7B

4. ✖ 5D

Question Number : 21 Question Id : 630680217612 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Convert $(67)_{10}$ to binary number.

Options :

1. ✖ $(1100001)_2$

2. ✖ $(1101011)_2$

3. ✖ $(10011)_2$

4. ✔ $(1000011)_2$

Question Number : 22 Question Id : 630680217613 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The 10's complement of $(23)_{10}$ is _____.

Options :

1. ✖ 12

2. ✖ 23

3.

4. ✔ 77

Question Number : 23 Question Id : 630680217614 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement related to complements.

I. For a positive number N in base r with an integer part of n digits, the r's complement of N is defined as $r^n - N$ for

$N \neq 0$ and 0 for N = 0.

II. For a positive number N in base r with an integer part of n digits and a fraction part of m digits, the (r – 1)'s

complement of N is defined as $r^n - r^{-m} - N$.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 24 Question Id : 630680217615 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement related to flip flop.

I. The D-flip flop is either used as a delay device or as a latch to store 1-bit of binary information.

II. In a J-K flip flop, if J = K, the resulting flip flop is referred to as a D-flip flop.

Options :

1. ✔ Only I

2. ✘ Only II

3. ✘ Both I and II

4. ✘ Neither I nor II

Question Number : 25 Question Id : 630680217616 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement related to edge triggered flip flop.

I. Set-up time (t_s) is the time required for the input data to settle in before the triggering edge of the clock.

II. Hold time (t_h) is the time for which the data must remain stable after the triggering edge of the clock.

III. The maximum clock frequency (f_{max}) is the highest rate at which a flip flop can be reliably triggered.

Options :

1. ✘ I and II only

2. ✘ II and III only

3. ✔ I, II and III

4. ✗ I and III only

Question Number : 26 Question Id : 630680217617 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following Gate with their Algebraic function.

	Gate		Algebraic function
I	EXOR	1	$(xy)'$
II	EXNOR	2	$(x + y)'$
III	NAND	3	$xy' + x'y$
IV	NOR	4	$xy + x'y'$

Options :

1. ✗ I-1, II-3, III-2, IV-4

2. ✔ I-3, II-4, III-1, IV-2

3. ✗ I-2, II-4, III-3, IV-1

4. ✗ I-3, II-2, III-1, IV-4

Question Number : 27 Question Id : 630680217618 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct pair from the given pairs.

I. $x + 0 = x$: Postulate 2

II. $x + x' = 1$: Postulate 5

III. $x + y = y + x$: Postulate 3

IV. $x(y + z) = xy + xz$: : Postulate 4

Options :

1. ✔ I, II, III and IV

2. ✖ I, III and IV only

3. ✖ I and II only

4. ✖ III and IV only

Question Number : 28 Question Id : 630680217619 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the given Binary numbers in an increasing order.

I. 0011

II. 1010

III. 0110

IV. 1110

Options :

1. ✖ I, II, IV, III

2. ✘ III, I, IV, II
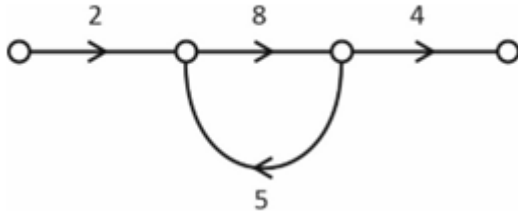
3. ✔ I, III, II, IV

4. ✘ II, IV, III, I

Question Number : 29 Question Id : 630680217620 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the chronological order of the design procedure from combinational logic.

I. The number of available input variables and required output variables is determined.

II. The problem is stated.

III. The input and output variables are assigned letter symbols.

IV. The truth table that defines the required relationship between inputs and outputs is derived.

V. The logic diagram is drawn.

VI. The simplified Boolean function for each output is obtained.

Options :

1. ✘ V, I, II, VI, III, IV

2. ✔ II, I, III, IV, VI, V

3. ✘ III, IV, V, VI, II, I

4. ✘ IV, III, II, I, VI, V

Question Number : 30 Question Id : 630680217621 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

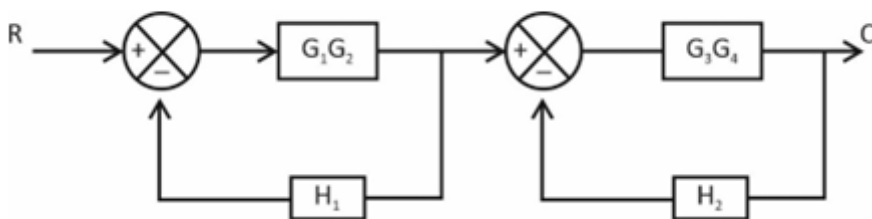Determine the transfer function of the given figure.

Options :

1. ✖ 8/5

2. ✖ 64/5

3. ✖ 64/4

4. ✔ 64/39

Question Number : 31 Question Id : 630680217622 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Determine the transfer function of the given block diagram.

Options :

1. ✖

$$\frac{G_1G_2}{(1+G_1G_2H_1)} + \frac{G_3G_4}{(1+G_3G_4H_2)}$$

2. ✗ $$\frac{G_1G_2G_3G_4}{1+G_1G_2G_3G_4H_1H_2}$$

3. ✔ $$\frac{G_1G_2G_3G_4}{1+G_3G_4H_2+G_1G_2H_1+G_1G_2G_3G_4H_1H_2}$$

4. ✗ $$\frac{1}{(1+G_1G_2H_1)} + \frac{1}{(1+G_3G_4H_2)}$$

Question Number : 32 Question Id : 630680217623 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

If a ramp error is applied to a type 2 system, then what will be the steady state error for the ramp input?

Options :

1. ✗ Infinity

2. ✗ $\frac{1}{K_v}$

3. ✔ Zero

4. ✗ K_v

Question Number : 33 Question Id : 630680217624 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the steady state response due to a unit step input for a given transfer function?

$$H(s) = \frac{(s+4)}{(s+1)(s+3)}$$

Options :

1. ✖ $\dfrac{3}{4}$

2. ✖ 2

3. ✔ $\dfrac{4}{3}$

4. ✖ Infinite

Question Number : 34 Question Id : 630680217625 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A unity feedback system has a forward transfer function. Determine the range of K for the system from the given transfer function.

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

Options :

1. ✖ $0 < K < 520$

2. ✖ $-52 < K < 0$

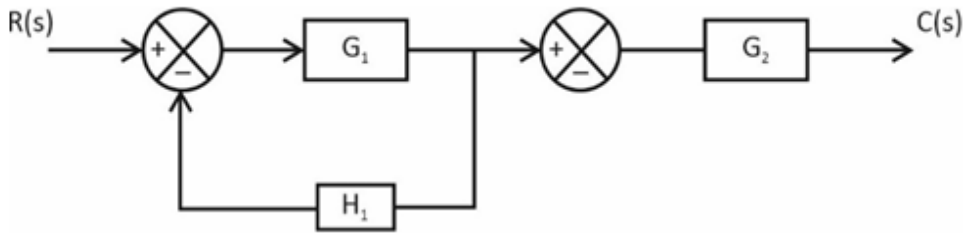3. ✖ $-48 < K < 0$

4. ✔ $0 < K < 48$

Question Number : 35 Question Id : 630680217626 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The state space representation of system is given by

$$\dot{X} = \begin{bmatrix} -2 & 0 \\ 0 & -4 \end{bmatrix} X + \begin{bmatrix} 1 \\ 0 \end{bmatrix} U \text{ and } Y = \begin{bmatrix} 1 \\ 1 \end{bmatrix}^T X$$

The transfer function of the system is _____.

Options :

1. ✖ $\dfrac{1}{(s+4)}$

2. ✔ $\dfrac{1}{(s+2)}$

3. ✖ $\dfrac{s^2+6s+8}{(s+2)(s+4)}$

4. ✖ $\dfrac{1}{(s+2)(s+4)}$

Question Number : 36 Question Id : 630680217627 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The system transfer function for the block diagram given below is _____.

Options :

1. ✖ $\dfrac{G_1}{1 + H_1} + G_2$

2. ✖ $\dfrac{G_1 G_2}{1 + H_1}$

3. ✔ $\dfrac{G_1 G_2}{1 + G_1 H_1}$

4. ✖ $\dfrac{G_1 G_2}{1 + G_1 G_2 H_1}$

Question Number : 37 Question Id : 630680217628 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement regarding signal flow graph.

I. Signal flow graph is a graphical representation of the relationships between the variables of a set of linear algebraic equations.

II. The relationship between an input variable and an output variable of a signal flow graph is given by the net gain between the input and output nodes and is known as the overall gain of the system. Mason's gain formula for the determination of the overall gain is given by $T = \dfrac{1}{\Delta} \displaystyle\sum_{K} P_K \Delta_K$

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 38 Question Id : 630680217629 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A
Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement regarding signal flow graph terms.

I. Loops are said to be non-touching if they do not possess any common node.

II. Path is the traversal of connected branches in the direction of the branch arrows such that no node is traversed more than twice.

Options :

1. ✔ Only I

2. ✖ Only II

3. ✱ Both I and II

4. ✱ Neither I nor II

Question Number : 39 Question Id : 630680217630 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement regarding the time response specification.

I. Setting time (t_s) is the time required for the response to reach and stay within a specified tolerance band of its final value.

II. Delay time (t_d) is the time required for the response to reach 50 percent of the final value in the first attempt.

III. Steady state error (e_{ss}) indicates the error between the actual output and desired output as t tends to infinity.

Options :

1. ✱ I and III only

2. ✱ II and III only

3. ✱ I and II only

4. ✔ I, II and III

Question Number : 40 Question Id : 630680217631 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following.

	Time Response Specification		Expression
I	Peak time	1	$\dfrac{4}{\xi \omega_n}$
II	Peak overshoot	2	$\dfrac{\pi}{\omega_n \sqrt{1 - \xi^2}}$
III	Rise time	3	$e^{-\pi \xi / \sqrt{(1 - \xi^2)}}$
IV	Settling time	4	$\dfrac{\pi - tan^{-1}\left(\dfrac{\sqrt{1 - \xi^2}}{\xi}\right)}{\omega_n \sqrt{1 - \xi^2}}$

Options :

1. ✖ I-1, II-2, III-3, IV-4

2. ✖ I-3, II-2, III-4, IV-1

3. ✔ I-2, II-3, III-4, IV-1

4. ✖ I-4, II-2, III-3, IV-1

Question Number : 41 Question Id : 630680217632 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct pair of the type of input with their steady state error for type 1 system.

I. Unit step: 0

II. Unit ramp : $\frac{1}{K_v}$

III. Unit parabolic : 0

Options :

1. ✖ I, II, III

2. ✔ I and II only

3. ✖ II and III only

4. ✖ I and III only

Question Number : 42 Question Id : 630680217633 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A
Minimum Instruction Time : 0
Correct Marks : 2 Wrong Marks : 0

A phase-lead network has its transfer function $G(s) = \dfrac{(1 + T_1 s)}{(1 + T_2 s)}$

Case I. $T_1 = 0.04$ and $T_2 = 0.04$

Case II. $T_1 = 0.01$ and $T_2 = 0.01$

Case III. $T_1 = 0.04$ and $T_2 = 0.01$

Then arrange these in increasing order of their respective frequency at which the maximum phase lead occurs.

Options :

1. ✖ Case I, Case II, Case III

2. ✖ Case II, Case I, Case III

3. ✖ Case III, Case I, Case II
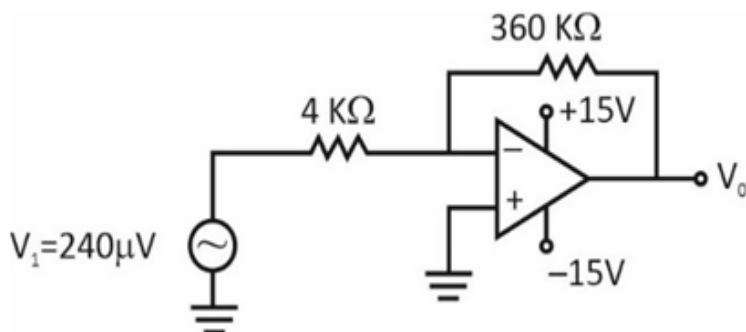
4. ✔ Case I, Case III, Case II

Question Number : 43 Question Id : 630680217634 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the chronological order involved in constructing the Bode plot?

I. Identify the corner frequencies associated with each factor of the transfer function.

II. Draw a smooth curve through the corrected points such that it is asymptotic to be the line segments. This gives the actual log magnitude plot.

III. Rewrite the sinusoidal transfer function in the time constant.

IV. Draw phase angle curve for each factor and add them algebraically to get the phase plot.

Options :

1. ✖ I, IV, II, III

2. ✔ III, I, II, IV

3. ✖ IV, I, III, II

4. ✖ II, I, III, IV

Question Number : 44 Question Id : 630680217635 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 2 Wrong Marks : 0

Determine the current drawn from a dual power supply of ±24 V if the IC dissipates 2000 mW.

Options :

1. ✖ 40 mA

2. ✖ 166.67 mA

3. ✔ 41.67 mA

4. ✖ 83.34 mA

Question Number : 45 Question Id : 630680217636 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Determine the output voltage for the given circuit with a sinusoidal input of 12 mV.

Options :

1. ✖ −24 V

2. ✔ −1.08 V

3. ✖ 12 V

4. ✖ 15 V

Question Number : 46 Question Id : 630680217637 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The CMRR of an op-amp with differential and common mode gain is given by _____ .

Options :

1. ✖ $A_d + A_c$

2. ✖ $\dfrac{A_c}{A_d}$

3. ✖ $\dfrac{1+A_d}{A_c}$
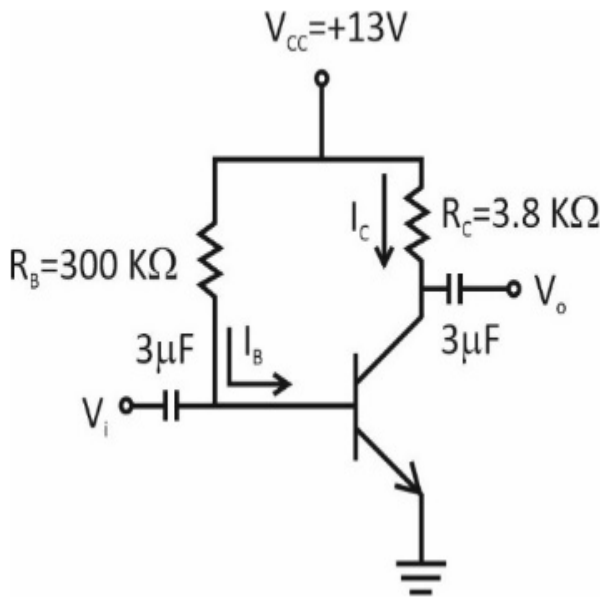
4. ✔ $\dfrac{A_d}{A_c}$

Question Number : 47 Question Id : 630680217638 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The expression of differentiator in operational amplifiers is _____ .

Options :

1. ✖ $v_0(t) = \dfrac{-1}{RC}\dfrac{dv_1(t)}{dt}$

2. ✔ $v_0(t) = -RC \frac{dv_1(t)}{dt}$

3. ✘ $v_0(t) = -RC \int v_1(t)$

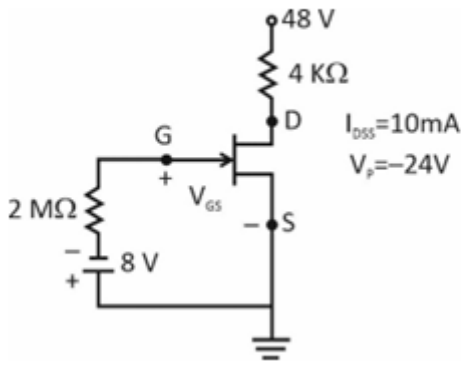4. ✘ $v_0(t) = \frac{-1}{RC} \int v_1(t)$

Question Number : 48 Question Id : 630680217639 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Calculate the output voltage of a non-inverting amplifier, if $V_1 = 5$ V, $R_f = 1500$ KΩ and $R_1 = 300$ KΩ.

Options :

1. ✘ 5 V

2. ✘ 3 V

3. ✘ 16 V

4. ✔ 30 V

Question Number : 49 Question Id : 630680217640 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Determine the base-emitter current (I_B) for the fixed bias configuration of the given circuit.

$V_{cc}=+13V$

$R_c=3.8\ K\Omega$

$R_B=300\ K\Omega$

$3\mu F$

V_o

$3\mu F$

V_i

Options :

1. ✗ $0.041\ \mu A$

2. ✓ $41\ \mu A$

3. ✗ $24.58\ \mu A$

4. ✗ $15.28\ \mu A$

Question Number : 50 Question Id : 630680217641 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Determine the V_{GS} from the given circuit.

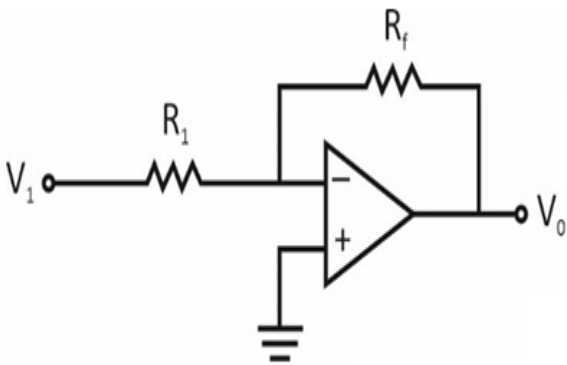
Options :

1. ✖ 0 V

2. ✔ −8 V

3. ✖ −24 V

4. ✖ 48 V

Question Number : 51 Question Id : 630680217642 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement relating to a hybrid equivalent model.

I. The parameter h_{12} is the ratio of input voltage to the output voltage with the input current equal to zero. It has a unit of ohms. It is also called the open circuit reverse transfer voltage ratio parameter.

II. The parameter h_{11} ratio indicates that the parameter h_{11} is the impedance parameter with the units of ohms. Because it is the ratio of the input voltage to the input current with the output terminals shorted, it is called the short-circuit input-impedance parameter.
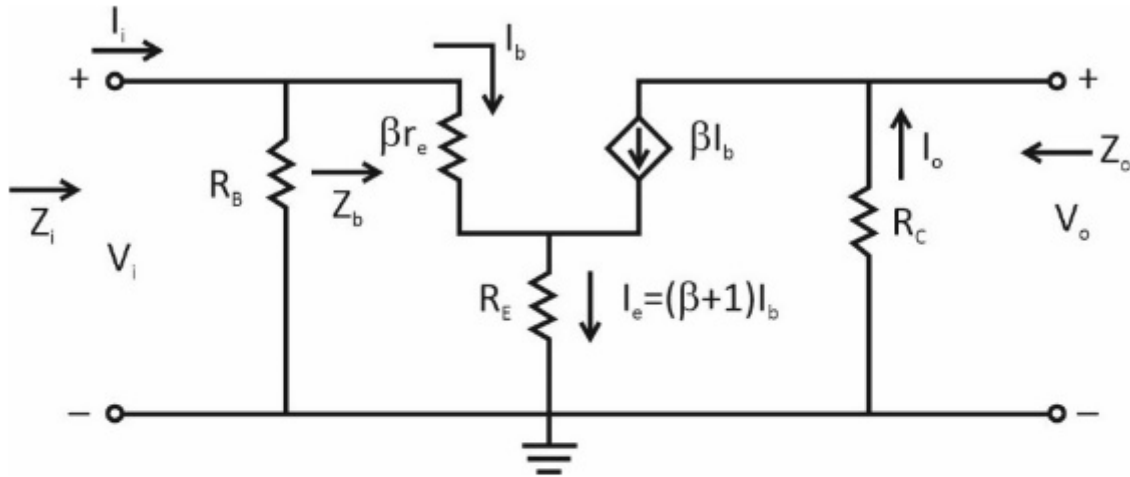
Options :

1. ✖ Only I

2. ✔ Only II

3. ✘ Both I and II

4. ✘ Neither I nor II

Question Number : 52 Question Id : 630680217643 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct one related to given basic op-amp connection.

I. If $R_f = R_1$, the voltage gain is exactly 1 for a unity gain.

II. If R_f is some multiple of R_1, the overall amplifier gain is a constant in case of constant magnitude gain.

Options :
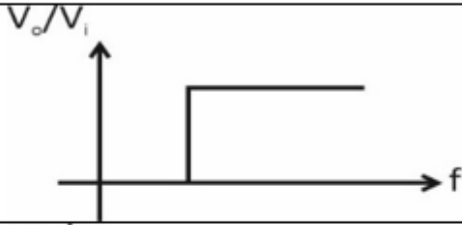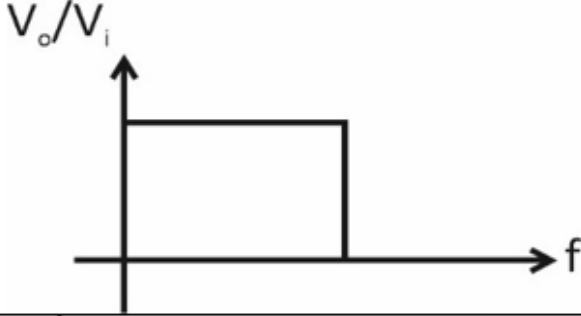
1. ✘ Only I

2. ✘ Only II

3. ✔ Both I and II

4. ✘ Neither I nor II

Question Number : 53 Question Id : 630680217644 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct one related to CE emitter-bias configuration.

I. Input impedance, $Z_i = R_B || \beta r_e$

II. Output impedance, $Z_o = R_C$

III. Voltage amplification, $A_v \cong -\dfrac{R_C}{R_E}$

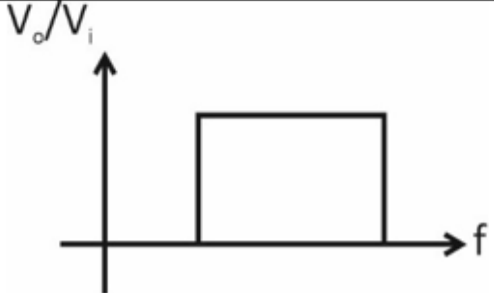**Options :**

1. ✖ I and II

2. ✖ II and III

3. ✖ I and III

4. ✔ I, II and III

Question Number : 54 Question Id : 630680217645 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following filters with their respective response.

	Filters		Response
I	Low pass filter	1	
II	Band pass filter	2	
III	High pass filter	3	

Options :

1. ✖ I-1, II-3, III-2

2. ✖ I-2, II-1, III-3

3. ✔ I-2, II-3, III-1
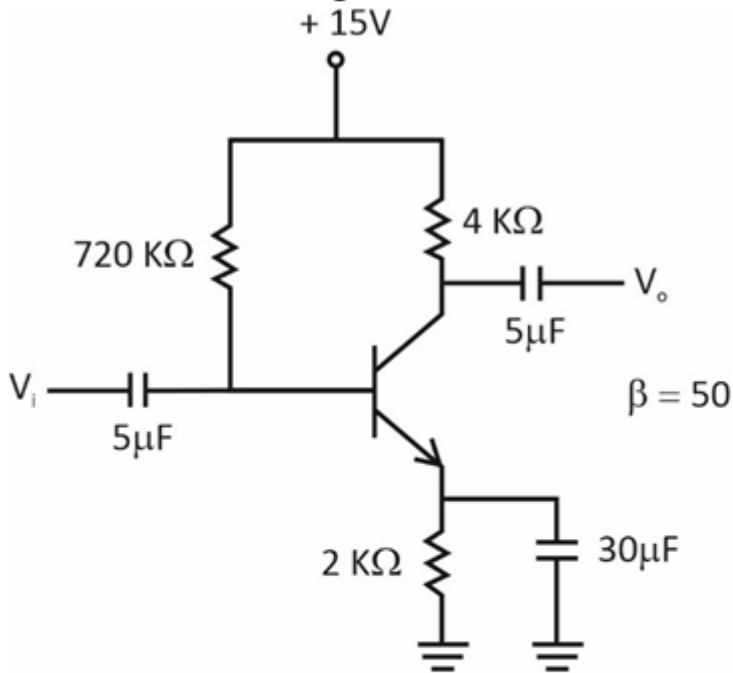
4. ✖ I-1, II-2, III-3

Question Number : 55 Question Id : 630680217646 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct pair of term: expression related to FET (Field Effect Transistor) Amplifiers.

I. Shockley equation: $I_D = I_{DSS}(1 - V_{GS}/V_P)^2$

II. Transconductance : $g_m = \frac{\Delta I_D}{\Delta V_{GS}}$

III. Voltage gain : $A_v = -g_m R_D$

Options :

1. ✖ II and III only

2. ✖ I and II only

3. ✖ I and III only

4. ✔ I, II and III

Question Number : 56 Question Id : 630680217647 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Consider the circuit given below.

Determine the voltage emitter (V_{E1}, V_{E2}, V_{E3}) values for given currents.

I. V_{E1} for $I_E = 1.75$ mA

II. V_{E2} for $I_E = 2.5$ mA

III. V_{E3} for $I_E = 3.75$ mA

Arrange V_{E1}, V_{E2} and V_{E3} in increasing order.

Options :

1. ✖ V_{E3}, V_{E2}, V_{E1}

2. ✖ V_{E2}, V_{E1}, V_{E3}

3. ✔ V_{E1}, V_{E2}, V_{E3}

4. ✖ V_{E3}, V_{E1}, V_{E2}

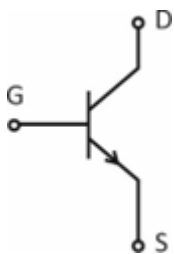Question Number : 57 Question Id : 630680217648 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A
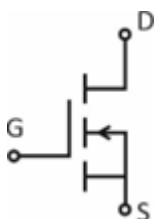
Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the correct logical order of a semi-conductor material according to its knee voltage (increasing order)?

I. GaAs

II. Ge

III. Si

Options :

1. ✖ I, II, III

2. ✔ II, III, I

3. ✖ II, I, III

4. ✖ III, I, II

Question Number : 58 Question Id : 630680217649 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the symbol for Insulated-Gate Bipolar Transistor (IGBT).
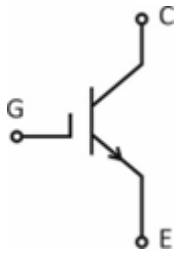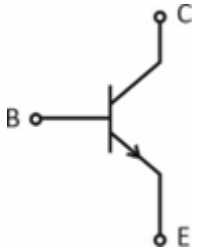
Options :

1. ✖

2. ✖

3. ✔

4. ✘

Question Number : 59 Question Id : 630680217650 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the characteristics of Triode for Alternating Current (TRIAC).

Options :

1. ✘

2. ✘

3. ✖

4. ✔

Question Number : 60 Question Id : 630680217651 Question Type : MCQ Option Shuffling : Yes
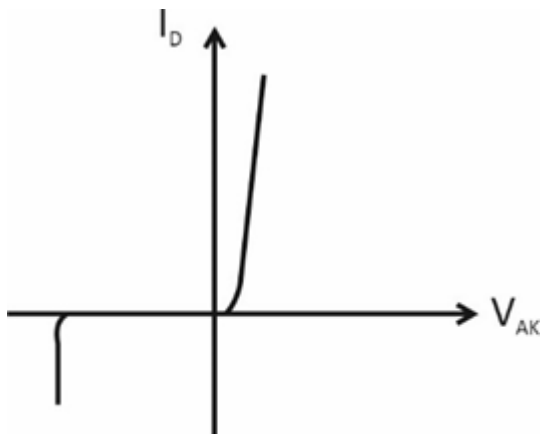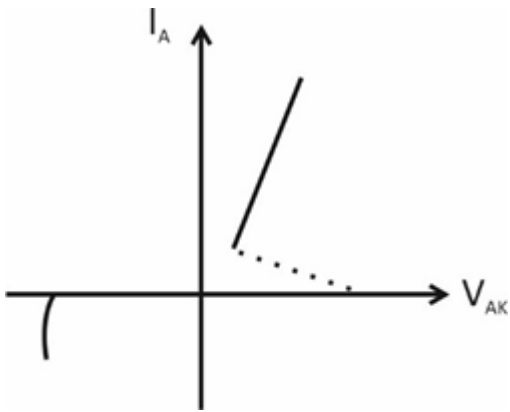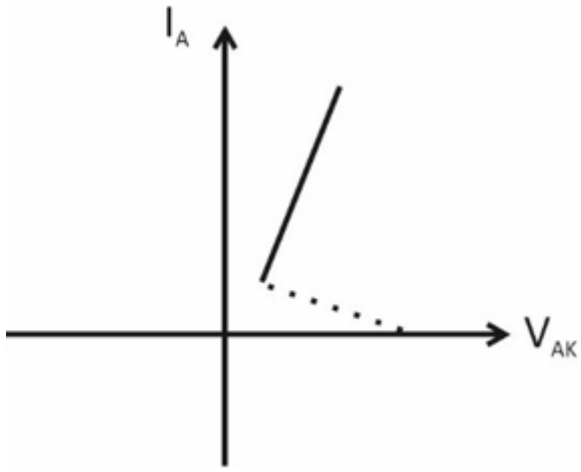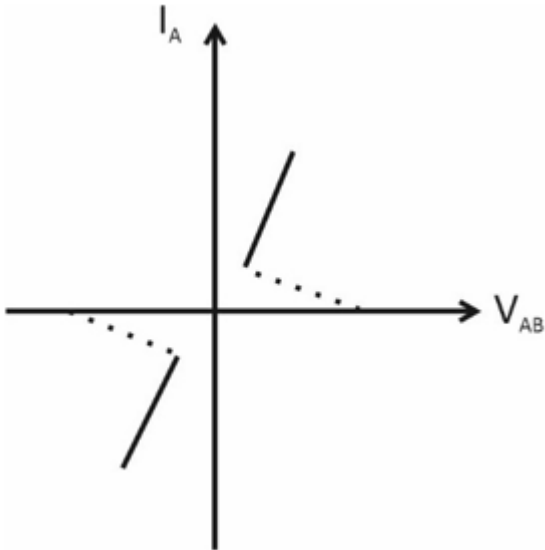
Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A diode circuit with an LC load is shown in figure below with the capacitor having an initial voltage;

$V_c(t = 0) = -V_{co} = V_0 = 300$ V, capacitance, $C = 30$ μf and inductance, $L = 120$ μH.

If switch S_1 is closed at $t = 0$, determine the peak current through the diode.

Options :

1. ✖ 50 A

2. ✖ 100 A

3. ✔ 150 A

4. ✖ 300 A

Question Number : 61 Question Id : 630680217652 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the ripple factor expression from the given options.

Options :

1. ✖ $\sqrt{\left(\dfrac{V_{rms}}{V_{dc}}\right)}$

2. ✔ $\sqrt{\left(\frac{V_{rms}}{V_{dc}}\right)^2 - 1}$

3. ✘ $\sqrt{V_{rms}^2 - V_{dc}^2}$
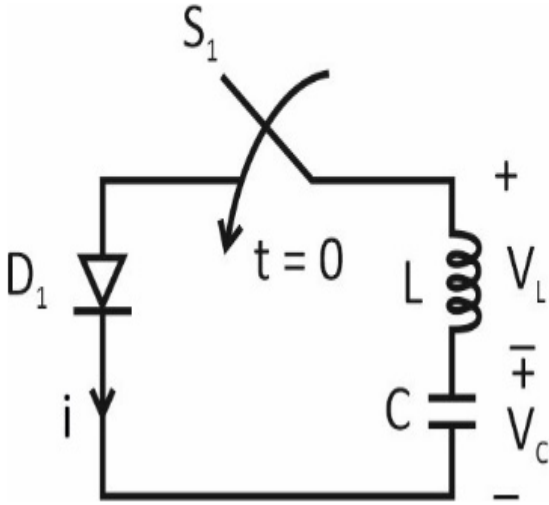
4. ✘ $\frac{V_{rms}}{V_{dc}}$

Question Number : 62 Question Id : 630680217653 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Determine the collector current from the given circuit.

Where, V_{CC} = 350 V, R_C = 15Ω, V_{CE} = 2 V.

Options :

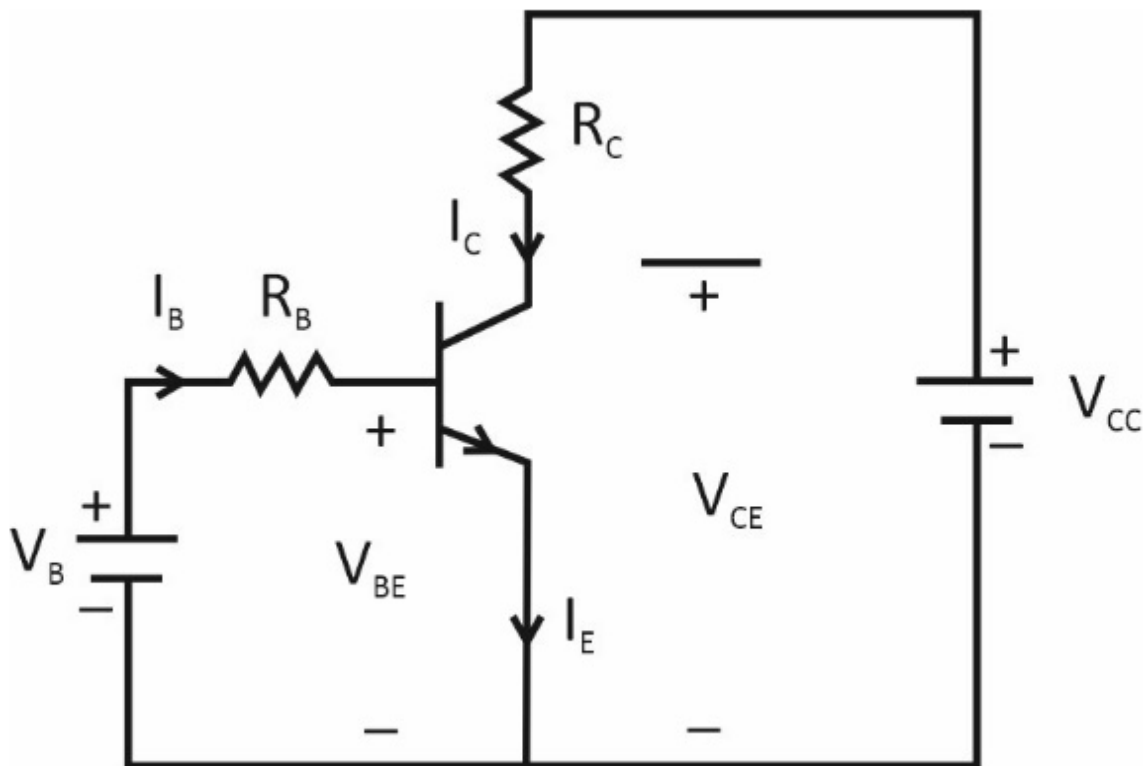1. ✘ 16.4 A

2. ✔ 23.2 A

3. ✘ 32.4 A

4. ✘ 40 A

Question Number : 63 Question Id : 630680217654 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The D.C. convertor has a resistive load of R = 20 Ω and the input voltage is V_s = 280 V. When the converter switch remains on, its voltage drop is V_d = 2V. If the duty cycle is 50 percent, then determine the average output voltage V_a.

Options :

1. ✔ 139 V

2. ✘ 278 V

3. ✘ 280 V

4. ✘ 140 V

Question Number : 64 Question Id : 630680217655 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the average output voltage of Buck regulators.

Options :

1. ✖ $V_a = (1 - K)V_s$

2. ✔ $V_a = KV_s$

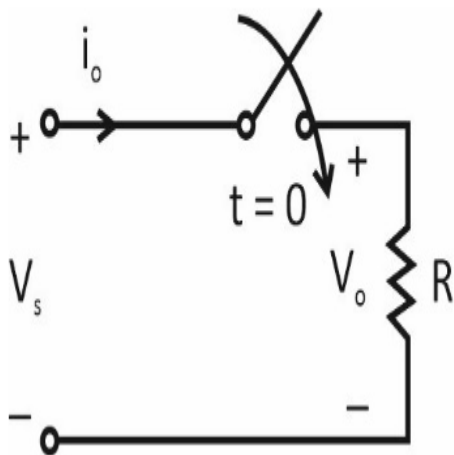3. ✖ $V_a = \dfrac{V_s}{1-K}$

4. ✖ $V_a = \dfrac{-V_s K}{1-K}$

Question Number : 65 Question Id : 630680217656 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following performance parameter statement is correct for an inverter?

I. The harmonic factor (of the nth harmonic), which is a measure of individual harmonic contribution, is defined as

$HF_n = \dfrac{V_{on}}{V_{o1}}$ for n > 1.

II. The total harmonic distortion, which is a measure of closeness in shape between a waveform and its fundamental

component, is defined as $THD = \dfrac{1}{V_{o1}} \left(\sum_{n=2,3,\ldots}^{\infty} V_{on}^2 \right)^{\frac{1}{2}}$

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 66 Question Id : 630680217657 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct control characteristic statement related to different thyristors.

I. For phase controlled Silicon-Controlled Rectifiers (SCRs) : Turn-on with a pulse signal, Turn-off with natural commutation.

II. For Gate Turn-off Thyristor (GTOs) : Turn-on with a positive pulse signal, Turn-off with a negative pulse signal.

III. For Static Induction Thyristor (SITHs) : Turned on by applying a positive gate drive voltage and turned off with a negative gate voltage.

Options :

1. ✖ I and II only

2. ✖ II and III only

3. ✖ I and III only

4. ✔ I, II and III

Question Number : 67 Question Id : 630680217658 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct switching frequency statement related to different thyristors.

I. Bidirectional thyristor : Low switching frequency

II. Static Induction Thyristor (SITHs) : High switching frequency

III. Triode for Alternating Current (TRIAC) : High switching frequency

IV. Gate Turn-off Thyristor (GTOs) : Medium switching frequency

Options :

1. ✖ I, II and III

2. ✔ I, II and IV

3. ✖ II, III and IV

4. ✖ I and IV

Question Number : 68 Question Id : 630680217659 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which statement is correct related to the performance parameter of a rectifier?

I. If ϕ is the angle between the fundamental components of the input current and voltage, then ϕ is called the displacement angle. The displacement factor is defined as, DF = $\cos \phi$.

II. The harmonic factor (HF) of the input current is defined as $H.F = \left[\dfrac{I_s^2 - I_{s_1}}{I_{s_1}^2}\right]^{\frac{1}{2}}$.
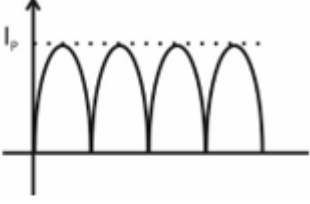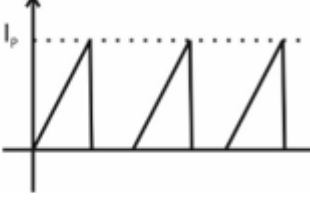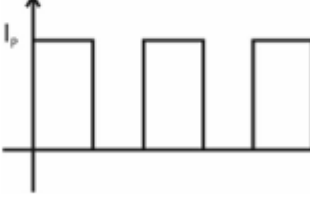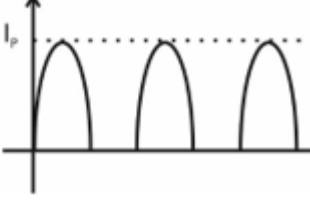
Options :

Question Number : 69 Question Id : 630680217660 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following.

	Wave form		RMS Current (I_{rms})
I		1	$I_{RMS} = I_P \sqrt{\dfrac{T_o}{T}}$
II		2	$I_{RMS} = I_P \sqrt{\dfrac{T_o}{2T}}$
III		3	$I_{RMS} = I_P \sqrt{\dfrac{T_o}{3T}}$
IV		4	$I_{RMS} = \dfrac{I_P}{\sqrt{2}}$

Options :

1. ✔ I-4, II-3, III-1, IV-2

2. ✖ I-2, II-3, III-1, IV-4

3. ✖ I-4, II-3, III-2, IV-1

4. ✖ I-1, II-3, III-4, IV-2

Question Number : 70 Question Id : 630680217661 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct pair in the context of switching regulators.

I. Buck regulator : $I_s = KI_a$

II. Boost regulator : $I_s = I_a(1 - K)$

III. Buck-boost regulator : $I_s = \dfrac{I_a K}{1-K}$

Options :

1. ✖ I and II

2. ✔ I and III

3. ✖ II and III

4. ✖ I, II and III

Question Number : 71 Question Id : 630680217662 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the given thyristors in increasing order of their respective maximum voltage ratings.

I. Phase controlled Silicon-Controlled Rectifiers (SCRs)

II. Bidirectional Thyristors

III. Magnetic-Tape Operating System (MTOs)

IV. Integrated Gate-Commutated Thyristors (IGCTs)

Options :

1. ✖ I, III, II, IV

2. ✔ I, IV, II, III

3. ✖ II, III, IV, I

4. ✖ I, II, III, IV

Question Number : 72 Question Id : 630680217663 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Consider series resonant inverters using two unidirectional thyristor switches.

Arrange the following modes of above in correct order (first to last).

I. This mode begins when T_2 is switched on and a reverse resonant current flows through the load.

II. This mode begins when thyristors T_1 and T_2 are off.

III. This mode begins when T_1 is fired and a resonant pulse of current flows through T_1 and the load.

Options :

1. ✖ II, III, I

2. ✖ I, III, II

3. ✖ II, I, III

4. ✔ III, II, I

Question Number : 73 Question Id : 630680217664 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which one is the correct expression for new p.u. impedance ($Z_{p.u.new}$)?

Options :

1. ✖ $Z_{p.u.old} \cdot \dfrac{KVA_{old}}{KVA_{new}} \left(\dfrac{V_{old}}{V_{new}} \right)$

2. ✖ $Z_{p.u.old} \cdot \dfrac{KVA_{old}}{KVA_{new}} \left(\dfrac{V_{old}}{V_{new}} \right)^2$

3. ✖ $Z_{p.u.old} \cdot \dfrac{KVA_{new}}{KVA_{old}} \left(\dfrac{V_{old}}{V_{new}} \right)$

4. ✔ $Z_{p.u.old} \cdot \dfrac{KVA_{new}}{KVA_{old}} \left(\dfrac{V_{old}}{V_{new}} \right)^2$
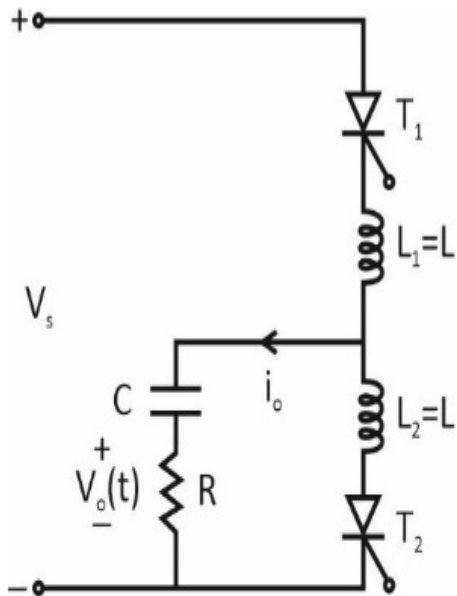
Question Number : 74 Question Id : 630680217665 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The ABCD constants of a 3-phase transmission line are A = D = 0.5 ∠1°, B = 230∠29°Ω, C = 0.008∠45.2° mho. The sending end voltage is 800 KV. The receiving end voltage under no-load condition is _____ .

Options :

1. ✖ 200 KV

2. ✖ 400 KV

3. ✖ 800 KV

4. ✔ 1600 KV

Question Number : 75 Question Id : 630680217666 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which type of rubber is used for both insulating and sheathing cables and has properties almost equal to those of natural rubber?

Options :

1. ✖ Butyl rubber

2. ✖ Silicon rubber

3. ✖ Neoprene rubber

4. ✔ Styrene rubber

Question Number : 76 Question Id : 630680217667 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A self-sustained electric discharge in which the field intensified ionization is localized only over a portion of the distance between the electrodes. This phenomenon is called _____.

Options :

1. ✖ Sag

2. ✖ Ferranti effect

3. ✔ Corona

4. ✖ Circuit breaking

Question Number : 77 Question Id : 630680217668 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

On a radial system the current setting of the relay farthest from the source should be minimum and it goes on increasing as we go towards the source. According to Indian standard specifications the operating value should exceed _____.

Options :

1. ✖ 0.1 times of setting

2. ✖ 0.5 times of setting

3. ✖ 0.8 times of setting

4. ✔ 1.3 times of setting

Question Number : 78 Question Id : 630680217669 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The expression for biased differential relay is _____.

Options :

1. ✖ $\dfrac{n_r}{n_o} = \dfrac{i_1 + i_2}{i_1 - \frac{i_2}{2}}$

2. ✔ $\dfrac{n_r}{n_o} = \dfrac{i_1 - i_2}{\frac{(i_1 + i_2)}{2}}$

3. ✖ $\dfrac{n_r}{n_o} = \dfrac{i_1 - i_2}{i_1 + \frac{i_2}{2}}$

4. ✖ $\dfrac{n_r}{n_o} = \dfrac{i_1 + i_2}{\frac{(i_1 - i_2)}{2}}$

Question Number : 79 Question Id : 630680217670 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The value of current or voltage below which a relay opens its contacts and comes to its original position is called as

_____.

Options :

1. ✖ Pick down level

2. ✖ Pick up level

3. ✔ Reset level

4. ✖ Reach

Question Number : 80 Question Id : 630680217671 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The tendency of the relay to operate at impedances larger than its setting is known as _____.

Options :

1. ✖ operating time

2. ✖ reset time

3. ✔ Overreach

4. ✖ auxiliary relays

Question Number : 81 Question Id : 630680217672 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Fusing factor is the ratio of _____.

Options :

1. ✔ $\dfrac{\text{Minimum fusing current}}{\text{Fuse rating}}$

2. ✖ $\dfrac{\text{Maximum fusing current}}{\text{Fuse rating}}$

3. ✖ $\dfrac{\text{Fuse rating}}{\text{Minimum prospective current}}$

4. ✖ $\dfrac{\text{Minimum fusing current}}{\text{Maximum fuse rating}}$

Question Number : 82 Question Id : 630680217673 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement related to protection relay.

I. Fuse is a device used in circuit for protecting electrical equipment's against overloads and/or short circuits.

II. Fuse element is that part of the fuse device which melts when an excessive current flows in the circuit and thus isolates the faulty device from the supply circuit.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 83 Question Id : 630680217674 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct objectives for a compensation of lines.

I. Ferranti effect is minimised so that a flat voltage profile will exit on the line for all loading condition.

II. The power transfer capability of the system will be enhanced and hence stability margins decreased.

Options :

1. ✔ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✖ Neither I nor II

Question Number : 84 Question Id : 630680217675 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement regarding SF_6 breaker.

I. The current chopping tendency is minimized by using the gas SF_6 at low pressure and low velocity.

II. The circuit breaker performance is not affected due to the atmospheric conditions.

III. Electrical clearances are drastically reduced due to low dielectric strength SF_6.

Options :

1. ✔ I and II only

2. ✖ II and III only

3. ✖ I and III only

4. ✖ I, II and III

Question Number : 85 Question Id : 630680217676 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the insulating fluids commonly used for circuit breakers.

I. Air at atmospheric pressure

II. Compressed air

III. Ultra high vacuum

IV. Oil which produces hydrogen for arc extinction.

Options :

1. ✖ I, II, III

2. ✖ II, III, IV

3. ✖ I, III, IV

4. ✔ I, II, III, IV

Question Number : 86 Question Id : 630680217677 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following related to Distance Relay characteristics.

	Type of distance relay		Characteristics
I	Directional relay	1	
II	Impedance relay	2	
III	Angle impedance relay	3	
IV	Mho relay	4	

Options :

1. ✖ I-1, II-2, III-3, IV-4

2. ✖ I-2, II-4, III-3, IV-1

3. ✖ I-3, II-4, III-1, IV-2

4. ✔ I-2, II-1, III-3, IV-4

Question Number : 87 Question Id : 630680217678 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct pair.

I. Base current $= \frac{KVA_b \times 100}{V_b}$

II. String efficiency $= \frac{\text{Voltage across the string}}{\text{Voltage across the unit near the power conductor}}$

III. Critical disruptive voltage $= rg_0 \delta l n \frac{d}{r} KV$

Options :

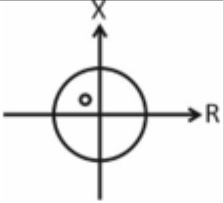1. ✗ I, II and III

2. ✗ I and II

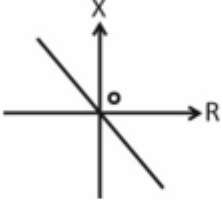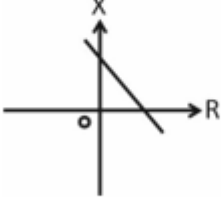3. ✓ I and III

4. ✗ II and III

Question Number : 88 Question Id : 630680217679 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Two insulator discs of identical capacitance value C make up a string for a 30 KV, 50 Hz, single phase overhead line insulating system. If the pin to earth capacitor is also C, then find string efficiency for the given value of K and arrange them in increasing order.

I. K = 1

II. K = 2

III. K = 3

Options :

1. ✗ II, I, III

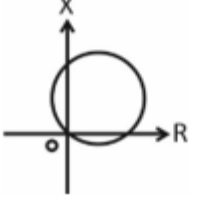2. ✅ III, II, I

3. ❌ III, I, II

4. ❌ II, III, I

Question Number : 89 Question Id : 630680217680 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the cross section of shielded cable from outermost side to inner most side.

I. Single wire armoured

II. Metallized paper

III. Conductor

Options :

1. ✅ I, II, III

2. ❌ III, I, II

3. ❌ III, II, I

4. ❌ II, I, III

Question Number : 90 Question Id : 630680217681 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Frequency 'f' of the e.m.f. generated in armature is given by _____.

Options :

1. ✗ $\dfrac{120N_S}{P}$

2. ✗ $\dfrac{120P}{N_S}$

3. ✔ $\dfrac{PN_S}{120}$

4. ✗ $\dfrac{120}{PN_S}$

Question Number : 91 Question Id : 630680217682 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The e.m.f. per turn for a single phase, 2200/220 V, 50 Hz transformer is approximately 20 volts. Calculate secondary turns.

Options :

1. ✔ 11

2. ✗ 16.92

3. ✗ 110

4. ✗ 121

Question Number : 92 Question Id : 630680217683 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which option is correct in relation to electrical degree and mechanical degree?

Options :

1. ✖ $\theta_{elect} = \dfrac{2}{P} \theta_{mech}$

2. ✖ $\theta_{elect} = \dfrac{\theta_{mech}}{P}$

3. ✔ $\theta_{elect} = \dfrac{P}{2} \theta_{mech}$

4. ✖ $\theta_{elect} = 2\theta_{mech}$

Question Number : 93 Question Id : 630680217684 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The current drawn by a 240 V D.C. motor of armature resistance 0.8 and back e.m.f 180 V is _____.

Options :

1. ✔ 75 A

2. ✖ 120 A

3. ✖ 150 A

4. ✖ 8 A

Question Number : 94 Question Id : 630680217685 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Find the internal torque of a D.C. generator, if the generated e.m.f. is 420 V, armature current is 20 A and speed = 1200 r.p.m.

Options :

1. ✖ 20 N_m

2. ✔ 66.81 N_m

3. ✖ 80 N_m

4. ✖ 108.5 N_m

Question Number : 95 Question Id : 630680217686 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A properly shunted centre-zero galvanometer is connected in the rotor circuit of a 4 pole, 50 Hz wound-rotor induction motor. If the galvanometer makes 120 complete oscillations in one minute, calculate the rotor speed.

Options :

1. ✖ 960 rpm

2. ✖ 1000 rpm

3. ✖ 1200 rpm

4. ✔ 1440 rpm

Question Number : 96 Question Id : 630680217687 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Machine efficiency (η) is defined as _____.

Options :

1. ✖ $\dfrac{Input + losses}{Input}$

2. ✖ $\dfrac{Input}{Input + losses}$

3. ✖ $\dfrac{Output}{Input + losses}$

4. ✔ $1 - \dfrac{losses}{Input}$

Question Number : 97 Question Id : 630680217688 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The distribution factor for fractional slot windings is obtained as _____.

Options :

1. ✔ $K_d = \dfrac{\sin\frac{\sigma}{2}}{\frac{\sigma}{2}}$

2. ✖ $K_d = \dfrac{\sin\sigma}{\sigma}$

3. ✖ $K_d = \dfrac{\sin\sigma}{\frac{\sigma}{2}}$

4. ✖ $K_d = 1 + \sin\sigma/2$

Question Number : 98 Question Id : 630680217689 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A 6-pole, 248 A, D.C. shunt generator has 360 conductors and is wave wound. Its field current is 2 A. Find the demagnetizing ampere turns per pole at full load, if brushes are on Geometrical Neutral Axis (GNA).

Options :

1. ✔ 0 ATs/pole

2. ✖ 500 ATs/pole

3. ✖ 2500 ATs/pole

4. ✖ 3000 ATs/pole

Question Number : 99 Question Id : 630680217690 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement related to electrical machines.

I. The peripheral distance between two adjacent poles, is called pole-pitch.

II. A coil with two coil-sides 180 electrical space degrees apart, is called a full-pitch coil.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 100 Question Id : 630680217691 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement related to the induction motor.

I. It has inherent self-starting torque.

II. It can operate only at lagging power factors.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 101 Question Id : 630680217692 Question Type : MCQ Option Shuffling :

Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement related to synchronous motor.

I. It runs at a constant synchronous speed at all possible loads.

II. Its maximum torque is proportional to supply voltage.

III. It can operate only at leading power factor.

Options :

1. ✔ I and II only

2. ✖ I and III only

3. ✖ II and III only

4. ✖ I, II and III

Question Number : 102 Question Id : 630680217693 Question Type : MCQ Option Shuffling :

Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which is the correct statement related to bad effects of hunting?

I. It produces severe mechanical stress and fatigue in the shaft.

II. It causes great surges in current and power flow.

III. It increases machine losses and thus the temperature rise of the machine.

Options :

1. ✖ Only I

2. ✖ II and III only

3. ✖ I and III only

4. ✔ I, II and III

Question Number : 103 Question Id : 630680217694 Question Type : MCQ Option Shuffling :

Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following methods of starting a three phase induction motor.

	Methods of starting a three phase induction motor		Relation between starting torque $T_{e.st}$ and full-load torque $T_{e.fl}$
I	Direct-on-line starting	1	$\dfrac{T_{e.st}}{T_{e.fl}} = x^2 \left(\dfrac{I_{sc}}{I_{fl}}\right)^2 S_{fl}$
II	Stator resistor starting	2	$\dfrac{T_{e.st}}{T_{e.fl}} = \dfrac{1}{3}\left(\dfrac{I_{sc.d}}{I_{fl.d}}\right)^2 S_{fl}$
III	Star delta starting	3	$\dfrac{T_{e.st}}{T_{e.fl}} = \left(\dfrac{I_{st}}{I_{fl}}\right)^2 S_{fl}$

Options :

1. ✖ I-1, II-2, III-3

2. ✖ I-3, II-2, III-1

3. ✖ I-1, II-3, III-2

4. ✔ I-3, II-1, III-2

Question Number : 104 Question Id : 630680217695 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Depending upon the value of slip an induction motor can have the following operating regions or mode. Identify the correct pairs.

I. Motoring Mode : $0 < S \leq 1$

II. Breaking Mode : $S > 1$

III. Generating Mode : $S < 0$

Options :

1. ✖ I and III only

2. ✖ II and III only

3. ✔ I, II and III

4. ✖ Only I

Question Number : 105 Question Id : 630680217696 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the given statements in correct order (from first to last) in order to use the saturated synchronous-reactance method for voltage-regulation.

I. First calculate air gap voltage.

II. Mark E_r on the O.C.C. and find the corresponding voltage on the air-gap line.

III. Obtain the saturation factor.

IV. Calculate X_{sag}.

V. Find saturated synchronous reactance X_{ss}.

VI. Draw phasor diagram, but with X_s replaced by X_{ss}. Calculate E_f and thus the voltage regulation.

Options :

1. ✖ I, II, IV,V, VI, III

2. ✖ I, II, V, IV, VI, III

3. ✖ I, V, IV, II, III, VI

4. ✔ I, II, III, IV,V, VI

Question Number : 106 Question Id : 630680217697 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A wave wrapped 12 pole, 116 A D.C. shunt generator contains 360 conductors. It has a field current of 4 A. Calculate the demagnetizing ampere turns per pole at full load, if brushes are shifted from Geometrical Neutral Axis (GNA) by:

I. 5° electrical

II. 10° electrical

III. 20° electrical

Arrange the demagnetizing ampere turns per pole values in each case in increasing order.

Options :

1. ✖ I, III, II

2. ✖ III, I, II

3. ✔ I, II, III

4. ✖ III, II, I

Question Number : 107 Question Id : 630680217698 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement related to laws of illumination.

I. Illumination is directly proportional to the luminous intensity of the source.

II. The illumination of a surface is inversely proportional to the square of the distance of the surface from the source and this is called inverse square law.

III. Illumination is directly proportional to the cosine of the angle made by the normal to the illuminated surface with the direction of the incident flux.

Options :

1. ✖ I and II only

2. ✖ I and III only

3. ✖ II and III only

4. ✔ I, II and III

Question Number : 108 Question Id : 630680217699 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which is the correct statement related to measuring the mean spherical candle power (M.S.C.P)?

I. The lamp whose M.S.C.P is to be determined, is placed at the center of the sphere and brightness of window is measured with the help of some form of illuminometer.

II. The test lamp is replaced by a standard lamp whose M.S.C.P is known and brightness of window is again measured.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 109 Question Id : 630680217700 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement related to flood lighting calculation.

I. Coefficient of utilization is also called 'beam factor' and is defined as the ratio of beam lumens to the lamp lumens.

II. Depreciation factor is defined as the ratio of illumination under ideal condition to the illumination under normal condition.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 110 Question Id : 630680217701 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The overall efficiency of dielectric heating is _____.

Options :

1. ✖ 20 percent

2. ✖ 80 percent

3. ✔ 50 percent

4.

Question Number : 111 Question Id : 630680217702 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A 210 V lamp has a total flux of 2100 lumens and takes a current of 0.4 A. Calculate lumens per watt.

Options :

1. ✖ 5

2. ✖ 15

3. ✔ 25

4. ✖ 50

Question Number : 112 Question Id : 630680217703 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following vapour or gas with the colour in an electric discharge lamp.

	Nature of gas or vapour		Colours
I	Neon discharge fields	1	Orange-yellow
II	Mercury vapour light	2	Orange-red
III	Sodium vapour light	3	Bluish

Options :

1. ✖ I-1, II-2, III-3

2. ✔ I-2, II-3, III-1

3. ✘ I-3, II-2, III-1

4. ✘ I-2, II-1, III-3

Question Number : 113 Question Id : 630680217704 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Average life of sodium vapour lamps is _____.

Options :

1. ✘ 500 hr

2. ✘ 1000 hr

3. ✔ 3000 hr

4. ✘ 4000 hr

Question Number : 114 Question Id : 630680217705 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Efficiency of mercury vapour lamps is _____.

Options :

1. ✖ 10 lm/W

2. ✔ 40 lm/W

3. ✖ 60 lm/W

4. ✖ 110 lm/W

Question Number : 115 Question Id : 630680217706 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct pair for flood lighting.

I. Narrow beam projectors – Beam spread between 12-25 degrees.

II. Medium angle projector – Beam spread between 25-40 degrees.

III. Wide angle projector – Beam spread between 40-90 degrees.

Options :

1. ✖ I and II only

2. ✖ I and III only

3. ✖ II only

4. ✔ I, II and III

Question Number : 116 Question Id : 630680217707 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the given regions from a typical speed-time curve for electric trains operating on passenger services in a correct order (first to last).

I. Constant acceleration period

II. Free running period

III. Acceleration on speed curve

IV. Coasting

V. Braking

Options :

1. ✖ II, I, III, IV, V

2. ✖ I, II, IV, III, V

3. ✔ I, III, II, IV, V

4. ✖ III, I, II, IV, V

Question Number : 117 Question Id : 630680217708 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following joints in increasing order of the different types of welds they have.

I. Tee joint

II. Corner joint

III. Edge joint

IV. Lap joint

V. Butt joint

Options :

1. ✖ III, IV, I, II, V

2. ✖ II, I, IV, V, III

3. ✔ III, II, IV,I, V

4. ✖ IV, I, V, II, III

Question Number : 118 Question Id : 630680217709 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which is the easiest, most economical and most used for all shielded arc welding?

Options :

1. ✔ Flat position

2. ✖ Horizontal position

3. ✖ Vertical position

4. ✖ Overhead position

Question Number : 119 Question Id : 630680217710 Question Type : MCQ Option Shuffling :

Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is defined as the energy consumed (Wh) per tonne mass of the train per km length of the run?

Options :

1. ✖ Energy consumption

2. ✖ Schedule speed

3. ✔ Specific energy consumption

4. ✖ Crest speed

Question Number : 120 Question Id : 630680217711 Question Type : MCQ Option Shuffling :

Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is defined as the amount of luminous flux given out in a space represented by one unit solid angle by a source having an intensity of one candle power in all directions?

Options :

1. ✖ Luminous intensity

2. ✖ Illumination

3. ✔ Lumen

4. ✖ Candle power

Question Number : 121 Question Id : 630680217712 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which type of load says that it always opposes motion?

Options :

1. ✖ Active load

2. ✔ Passive load

3. ✖ Rotational load

4. ✖ Linear load

Question Number : 122 Question Id : 630680217713 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The expression for energy loss during starting of motor is _____.

Options :

1. ✖ i^2R

2. ✗ iR

3. ✓ $\int_0^t i^2 R\, dt$

4. ✗ $\frac{di}{dt} R$

Question Number : 123 Question Id : 630680217714 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The operation of forward motoring comes under which of the four quadrants of operation?

Options :

1. ✓ Quadrant I

2. ✗ Quadrant II

3. ✗ Quadrant III

4. ✗ Quadrant IV

Question Number : 124 Question Id : 630680217715 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which single phase converter provides operation in all four-quadrant drives?

Options :

1. ✖ Single-phase half-wave converter drives

2. ✖ Single-phase semi converter drives

3. ✖ Single-phase full converter drives

4. ✔ Single-phase dual converter drives

Question Number : 125 Question Id : 630680217716 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The average armature voltage, $V_a = \frac{V_m}{2\pi}(1 + cos\, \alpha_a)$ is given by which single phase converter?

Options :

1. ✖ Single-phase full converter drives

2. ✖ Single-phase semi converter drives

3. ✔ Single-phase half-wave converter drives

4. ✖ Single-phase dual converter drives

Question Number : 126 Question Id : 630680217717 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which one is the expression of armature voltage for a three-phase half-wave converter?

Options :

1. ✖ $V_a = \frac{3\sqrt{3}V_m}{2\pi}(1 + \cos\alpha_a)$

2. ✖ $V_a = \frac{3\sqrt{3}V_m}{\pi}\cos\alpha_a$

3. ✔ $V_a = \frac{3\sqrt{3}V_m}{2\pi}\cos\alpha_a$

4. ✖ $V_a = \frac{\sqrt{3}V_m}{\pi}(1 + \cos\alpha_a)$

Question Number : 127 Question Id : 630680217718 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The regenerative braking would be effective only if the motor speed is _____.

Options :

1. ✖ $\omega > \omega_{min}$ only

2. ✖ $\omega > \omega_{max}$ only

3. ✔ $\omega_{min} < \omega < \omega_{max}$

4. ✖ $\omega < \omega_{min}$ only

Question Number : 128 Question Id : 630680217719 Question Type : MCQ Option Shuffling :

Correct Marks : 2 Wrong Marks : 0

Which of the following is a type of A.C. drive?

I. Induction motor drives

II. Synchronous motor drives

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 129 Question Id : 630680217720 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement related to stepper motor control in A.C. Drive.

I. Stepper motors are electromechanical motion devices, which are used primarily to convert information in digital form to mechanical motion.

II. Stepper motors are synchronous machines that are operated as stepping motors.

III. Stepper motors falls into two types; the variable-reluctance stepper motor and the permanent-magnet stepper motor.

Options :

1. ✖ Only II and III

2. ✖ Only I and II

3. ✖ Only I and III

4. ✔ I, II and III

Question Number : 130 Question Id : 630680217721 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement related to A.C. Drive.

I. A.C. drive requires advanced control techniques for control of voltage, frequency and current.

II. Synchronous motors are constant-speed machines and their speeds can be controlled by voltage frequency or current.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 131 Question Id : 630680217722 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct increasing order of the four quadrants of D.C. drives.

I. Reverse motoring

II. Forward braking

III. Forward motoring

IV. Reverse braking

Options :

1. ✗ I, II, III, IV

2. ✗ II, III, IV, I

3. ✓ III, II, I, IV

4. ✗ IV, III, II, I

Question Number : 132 Question Id : 630680217723 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct pair related to operating modes of D.C. drive.

I. Motoring : Back emf E_g is less than supply voltage V_a.

II. Regenerative braking : Induced voltage E_g must be greater than supply voltage V_a.

Options :

1. ✗ Only I

2. ✗ Only II

3. ✔ Both I and II

4. ✘ Neither I nor II

Question Number : 133 Question Id : 630680217724 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following regions of operation with their slips.

	Region of operation		Slips
I	Motoring	1	$s < 0$
II	Regeneration	2	$1 \leq s \leq 2$
III	Plugging	3	$0 \leq s \leq 1$

Options :

1. ✘ I-1, II-2, III-3

2. ✘ I-3, II-2, III-1

3. ✔ I-3, II-1, III-2

4. ✘ I-2, II-1, III-3

Question Number : 134 Question Id : 630680217725 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following in the correct logical order (first to last) for the solution of a utilizing Thevenin's theorem.

I. Obtain Thevenin's equivalent circuit by placing R_{Th} in series with $V_{o.c}$.

II. Remove the load resistor (R_L) and find the open circuit voltage ($V_{o.c}$) across the open circuited load terminals.

III. Deactivate the constant sources and find the internal resistance of the source side looking through the open circuited load terminal. Let this resistance be R_{Th}.

IV. Reconnect R_L across the load terminals to get final circuit.

Options :

1. ✖ II, I, III, IV

2. ✖ III, I, II, IV
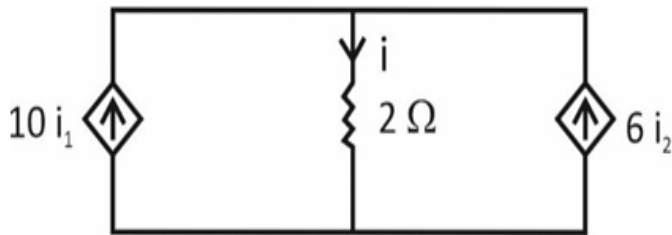
3. ✔ II, III, I, IV

4. ✖ I, III, II, IV

Question Number : 135 Question Id : 630680217726 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A voltage wave is represented by V = 100 sin314t, find the RMS value.

Options :

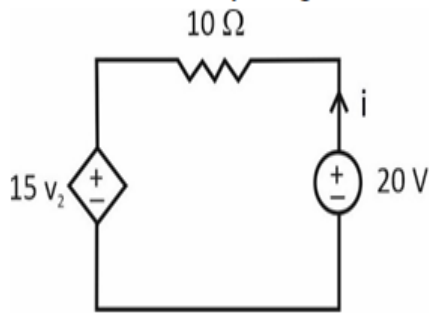1. ✖ 7.07 V

2. ✖ 141.42 V

3. ✔ 70.7 V

4. ✖ 173.20 V

Question Number : 136 Question Id : 630680217727 Question Type : MCQ Option Shuffling :
Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A
Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Find the value of i in the given circuit, if $i_1 = 6$ A and $i_2 = -4$ A in the dependent current sources.

Options :

1. ✖ 2 A

2. ✖ 16 A

3. ✔ 36 A

4. ✖ 84 A

Question Number : 137 Question Id : 630680217728 Question Type : MCQ Option Shuffling :
Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A
Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Find the value of i by using KVL in the given circuit. Assume $v_2 = 5$ in the dependent voltage source.

10 Ω

15 v_2

20 V

i

Options :

1. ✗ 1.5 A

2. ✓ −5.5 A
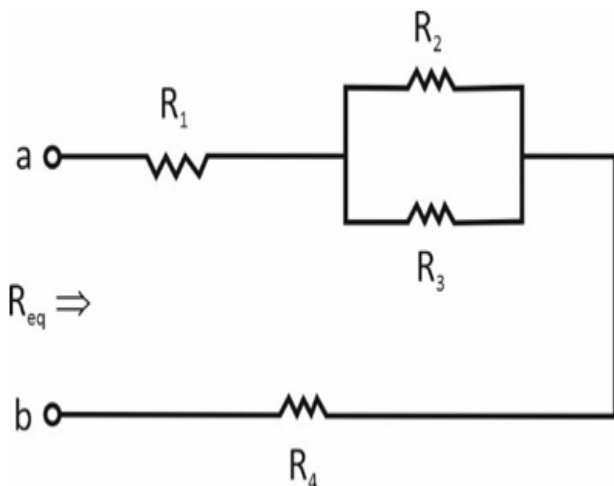
3. ✗ 40 A

4. ✗ −55 A

Question Number : 138 Question Id : 630680217729 Question Type : MCQ Option Shuffling :
Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A
Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Find the equivalent resistance of the given circuit. (where $R_1 = 8\ \Omega$, $R_2 = 6\ \Omega$, $R_3 = 3\ \Omega$, $R_4 = 5\ \Omega$)

R_2

R_1

a

R_3

$R_{eq} \Rightarrow$

b

R_4

Options :

1. ✗ 7 Ω

2. ✔ 15 Ω
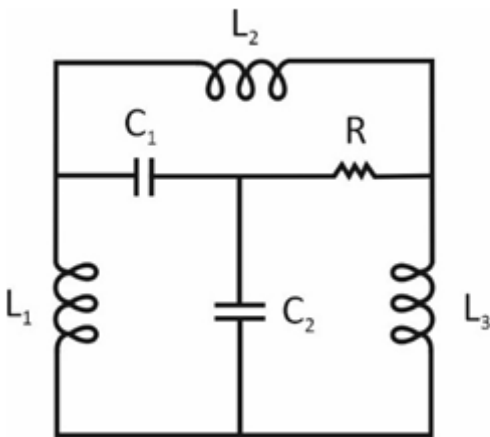
3. ✖ 25 Ω

4. ✖ 32 Ω

Question Number : 139 Question Id : 630680217730 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A network is shown below. Draw its graph.

Options :

1. ✖

2. ✖

3. ✖

4. ✔

Question Number : 140 Question Id : 630680217731 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
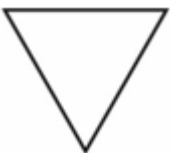
Correct Marks : 2 Wrong Marks : 0

In a series R-L circuit, a coil having resistance of 20 Ω and inductance of 2 H is switched on to a direct voltage of 500 V. Calculate the charging current.

Options :

1. ✘ $5(1 - e^{-10t})$

2. ✘ $15e^{-0.1t}$

3. ✔ $25(1 - e^{-10t})$

4. ✘ $100e^{-0.5t}$

Question Number : 141 Question Id : 630680217732 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Determine the voltage output across r_L.

Options :

1. ✖ 2.12 V
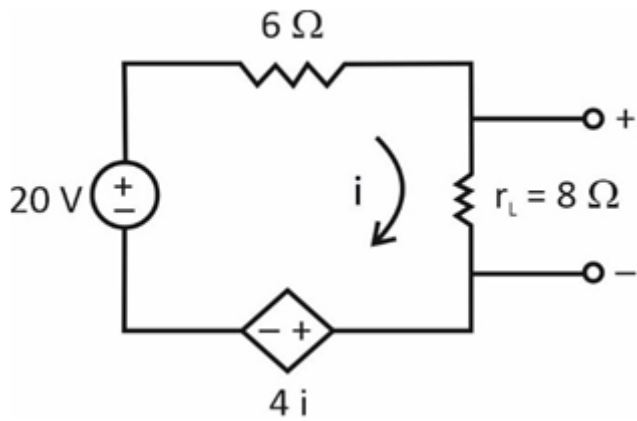
2. ✔ 8.88 V

3. ✖ 13.5 V

4. ✖ 28.1 V

Question Number : 142 Question Id : 630680217733 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A long, straight wire of circular cross section, radius 'a' has uniform current distribution. What is the expression of its internal inductance?

Options :

1. ✖ $\dfrac{\mu}{4\pi}$

2. ✖ $\dfrac{\mu}{2\pi} l\, n \left(\dfrac{a}{l}\right)$

3.

✔ $\frac{\mu}{8\pi}$

4. ✖ $\frac{\mu}{\pi} \cosh^{-1}\left(\frac{d}{2a}\right)$

Question Number : 143 Question Id : 630680217734 Question Type : MCQ Option Shuffling :

Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement.

I. The expression for the Poisson's equation is $\nabla.\nabla V = \frac{-\rho_v}{\epsilon}$.

II. The expression for the Laplace's equation is $\nabla^2 V = 0$.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 144 Question Id : 630680217735 Question Type : MCQ Option Shuffling :

Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement.

I. The Ampere's circuital law states that the line integral of **H** about any closed path is exactly equal to the direct current enclosed by that path, $\oint H.\,dL = I$.

II. The Maximum Power transfer theorem states that a resistance load, being connected to a D.C. network, receives maximum power when the load resistance is equal to the internal resistance (Thevenin's equivalent resistance) of the source network as seen from the load terminals.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 145 Question Id : 630680217736 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following Sinusoidal Response with their respective impedance angle.

	Sinusoidal Response		Impedance angle (θ)
I	Series RC circuit	1	$\tan^{-1}(\omega RC)$
II	Parallel RC circuit	2	$\tan^{-1}\left(\dfrac{1}{\omega RC}\right)$
III	Series RL circuit	3	$\tan^{-1}\left(\dfrac{R}{\omega L}\right)$
IV	Parallel RL circuit	4	$\tan^{-1}\left(\dfrac{\omega L}{R}\right)$

Options :

1. ✖ I-1, II-2, III-3, IV-4

2. ✔ I-2, II-1, III-4, IV-3

3. ✖ I-4, II-3, III-2, IV-1

4. ✖ I-1, II-3, III-4, IV-2

Question Number : 146 Question Id : 630680217737 Question Type : MCQ Option Shuffling :

Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct pair related to Laplace transformation.

I. Initial value theorem: $f(0^+) = \lim_{s \to \infty}[sF(s)]$

II. Final value theorem: $f(\infty) = \lim_{s \to 0}[sF(s)]$

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 147 Question Id : 630680217738 Question Type : MCQ Option Shuffling :

Correct Marks : 2 Wrong Marks : 0

For

I) I_{sc} is 5 A, R_{in} is 3 Ω and R_L is 1 Ω.

II) I_{sc} is 3 A, R_{in} is 4 Ω and R_L is 2 Ω.

III) I_{sc} is 7 A, R_{in} is 8 Ω and R_L is 6 Ω.

Arrange the value of load current in increasing order by using Norton's theorem expression for load current.

Options :

1. ✖ I, II, III

2. ✖ III, II, I

3. ✔ II, I, III

4. ✖ I, III, II

Question Number : 148 Question Id : 630680217739 Question Type : MCQ Option Shuffling :

Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

An A.C. voltage (v = 320 sin 314 t volts) is applied across a 2 H inductor. Which of the following is correct?

I) inductive reactance $X_L = 314$ Ω

II) maximum current $I_m = 0.51$ A

III) instantaneous current i = 0.51 sin(314t – 90°)

Options :

1. ✔ Only II and III

2. ✖ Only I and III

3. ✖ I, II and III

4. ✖ Only I and II

Question Number : 149 Question Id : 630680217740 Question Type : MCQ Option Shuffling :
Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A
Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the correct statement.

I. The load current expression in thevenin's theorem is as, $I_L = \frac{V_{oc}}{R_{Th}+R_L}$.

II. The load current expression in Norton's theorem is as, $I_L = i_{sc}\frac{R_{int}}{R_{int}+R_L}$.

III. Maximum power transfer expression in maximum power transfer theorem is as, $P_{max} = \frac{V_0^2}{4R_{Th}}$.

Options :

1. ✖ Only I and III

2. ✖ Only II and III

3. ✔ I, II and III

4. ✖ Only I and II

Question Number : 150 Question Id : 630680217741 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following in the chronological order for solution of a network utilizing reciprocity theorem.

I. The voltage source is interchanged between the branches concerned.

II. The current in the branch where the voltage source was existing earlier is calculated.

III. The branches between which reciprocity is to be established are to be selected first.

IV. The current in the branch is obtained using conventional network analysis.

Options :

1. ✖ I, III, II, IV

2. ✖ III, I, II, IV

3. ✔ III, IV, I, II

4. ✖ II, IV, III, I