Telangana State Council Higher Education

Notations :

1.Options shown in green color and with ✔ icon are correct.

2.Options shown in red color and with ✘ icon are incorrect.

Question Paper Name :	Instrumentation Engineering 4th Aug 2022 Shift 1
Subject Name :	Instrumentation Engineering
Creation Date :	2022-08-04 14:16:32
Duration :	120
Total Marks :	120
Display Marks:	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

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Show Progress Bar :	No

Instrumentation Engineering

Group Number :	1
Group Id :	34058049
Group Maximum Duration :	0
Group Minimum Duration :	120
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	120
Is this Group for Examiner? :	No
Examiner permission :	Cant View
Show Progress Bar? :	No

Mathematics

Section Id :	34058090
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	10
Section Marks :	10
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	34058090

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Question Shuffling Allowed : Yes

Question Number : 1 Question Id : 3405805761 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The local maximum of $f(x) = x^4 - 6x^3 + 11x^2 + 6x$ is

Options :

34058023041. ✗ $\frac{3}{5}$

34058023042. ✗ $\frac{9}{17}$

34058023043. ✓ $\frac{9}{16}$

34058023044. ✗ $\frac{3}{4}$

Question Number : 2 Question Id : 3405805762 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If C is the curve given by $x = 4\cos t$, $y = 3\sin t$, $t \in [0,\ 2\pi]$, then

$$\int_C 3x^2 y\,dx + \left(x^3 + y^2\right) dy =$$

Options :

34058023045. ✗ 4

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34058023046. ✗ 3

34058023047. ✗ 2

34058023048. ✓ 0

Question Number : 3 Question Id : 3405805763 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

$$\int_0^1\int_0^1\left(x^3y+x^2y^2+xy^3\right)dzdydx\ =$$

Options :

34058023049. ✗ $\frac{13}{24}$

34058023050. ✓ $\frac{13}{36}$

34058023051. ✗ $\frac{13}{39}$

34058023052. ✗ $\frac{13}{42}$

Question Number : 4 Question Id : 3405805764 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

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The sum of eigen values of $\begin{bmatrix} 4 & -1 & 0 \\ 0 & -3 & 2 \\ 2 & 5 & -1 \end{bmatrix}$ is

Options :

34058023053. ✖ 3

34058023054. ✖ -2

34058023055. ✖ 2

34058023056. ✔ 0

Question Number : 5 Question Id : 3405805765 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If the system of equations: $x + 2y = 1$, $y + 2z = 3$, $z + 2x = k$, $x + y + z = 0$ has a unique solution then $k =$

Options :

34058023057. ✖ -1

34058023058. ✖ -2

34058023059. ✖ -3

34058023060. ✔ -4

Question Number : 6 Question Id : 3405805766 Question Type : MCQ Option Shuffling : Yes

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

Correct Marks : 1 Wrong Marks : 0

If the particular integral y_p of $xy'' - 2xy' = x^2 - 2x$ is $y_p = ax^2 + bx$, then $a + b =$

Options :

34058023061. ✔ $\frac{1}{2}$

34058023062. ✘ $\frac{-1}{2}$

34058023063. ✘ 1

34058023064. ✘ -1

Question Number : 7 Question Id : 3405805767 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Residue of $f(z) = z^2 \operatorname{cosec} z$ at $z = 0$ is

Options :

34058023065. ✘ $-\pi i$

34058023066. ✘ πi

34058023067. ✔ 0

34058023068. ✘ $2\pi i$

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Question Number : 8 Question Id : 3405805768 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

$$\int_{|z|=1} \frac{z}{\sin z}\,dz =$$

Options :

34058023069. ✗ $2\pi i$

34058023070. ✗ $-\pi i$

34058023071. ✗ πi

34058023072. ✓ 0

Question Number : 9 Question Id : 3405805769 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If X is a Poisson variate such that P(X = 1) = P(X = 3), then the mean of X is

Options :

34058023073. ✗ $\sqrt{5}$

34058023074. ✓ $\sqrt{6}$

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34058023075. ✖ $\sqrt{3}$

34058023076. ✖ $\sqrt{2}$

Question Number : 10 Question Id : 3405805770 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If X is a discrete random variable with the probability distribution

x	−2	−1	0	1	2
P(X=x)	k	2k	3k	4k	5k

Then its mean is

Options :

34058023077. ✖ $\frac{1}{3}$

34058023078. ✔ $\frac{2}{3}$

34058023079. ✖ 1

34058023080. ✖ 2

Instrumentation Engineering

Section Id : 34058091

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Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	110
Number of Questions to be attempted :	110
Section Marks :	110
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	34058091
Question Shuffling Allowed :	Yes

Question Number : 11 Question Id : 3405805771 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The discrete time sequence $x[n]=n^2\left[u[n-1]-u[n-50]\right]$ is

Options :

34058023081. ✓ Non-periodic and energy signal

34058023082. ✗ Periodic and power signal

34058023083. ✗ Non-periodic and power signal

34058023084. ✗ Periodic and energy signal

Question Number : 12 Question Id : 3405805772 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

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: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A continuous time system is described by its impulse response is $h(t)=3x(t)+5$, then the system is

Options :

34058023085. ✗ Linear time invariant

34058023086. ✗ Linear time variant

34058023087. ✓ Non-linear time invariant

34058023088. ✗ Non-linear time variant

Question Number : 13 Question Id : 3405805773 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A discrete time sequence $x[n]$ is given as $x(n)=\left\{1, 2, 1-j, 2+j, 5\right\}$. Let $X(e\,j\omega)$ denote the discrete-time Fourier Transform of $x[n]$. The value of $\int_{-\pi}^{\pi} X\left(e^{jw}\right)dw$ is

Options :

34058023089. ✗ 1

34058023090. ✗ 0

34058023091. ✓ 2π

34058023092. ✗ 10π

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Question Number : 14 Question Id : 3405805774 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

$h_1(n)=\{\underset{\uparrow}{a}, b, c, b, a\}$ is an impulse response of a typical low pass filter, then

$h_2(n)=\{\underset{\uparrow}{a}, -b, c, -b, a\}$ is an impulse response of a

Options :

34058023093. ✗ Low pass filter

34058023094. ✓ High pass filter

34058023095. ✗ Band pass filter

34058023096. ✗ Band stop filter

Question Number : 15 Question Id : 3405805775 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

$x[n]=\left(\frac{1}{9}\right)^n u[-n-1]+\left(\frac{2}{9}\right)^n u[-n-1]$ the corresponding Z-transform $X(z)$ region of convergence (ROC) is

Options :

34058023097. ✓ $|z|<\frac{1}{9}$

34058023098. ✗ $\frac{1}{9}<|z|<\frac{2}{9}$

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34058023099. ✖ $|z| > \frac{2}{9}$

34058023100. ✖ ROC doesn't exist

Question Number : 16 Question Id : 3405805776 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If the message signal $m(t) = 2\sin(2000\pi t).\cos(4000\pi t)$ is to be converted as discrete time signal, then the minimum sampling frequency to avoid aliasing condition is

Options :

34058023101. ✖ 2 kHz

34058023102. ✖ 4 kHz

34058023103. ✖ 8 kHz

34058023104. ✔ 6 kHz

Question Number : 17 Question Id : 3405805777 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

An linear time invariant (LTI) system with impulse response $h(n) = (0.4)^n u(n) + (0.2)^n \delta(n-2)$ then the system is

Options :

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34058023105. ✗ Non-causal and un-stable

34058023106. ✗ Non-causal and stable

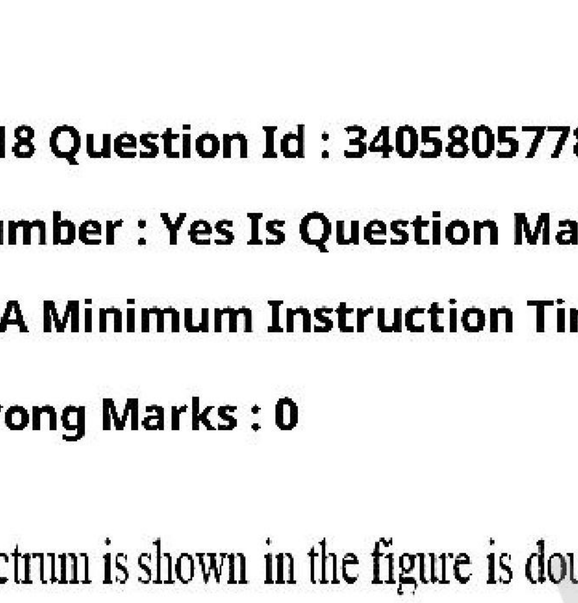
34058023107. ✗ Causal and un-stable

34058023108. ✓ Causal and stable

Question Number : 18 Question Id : 3405805778 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

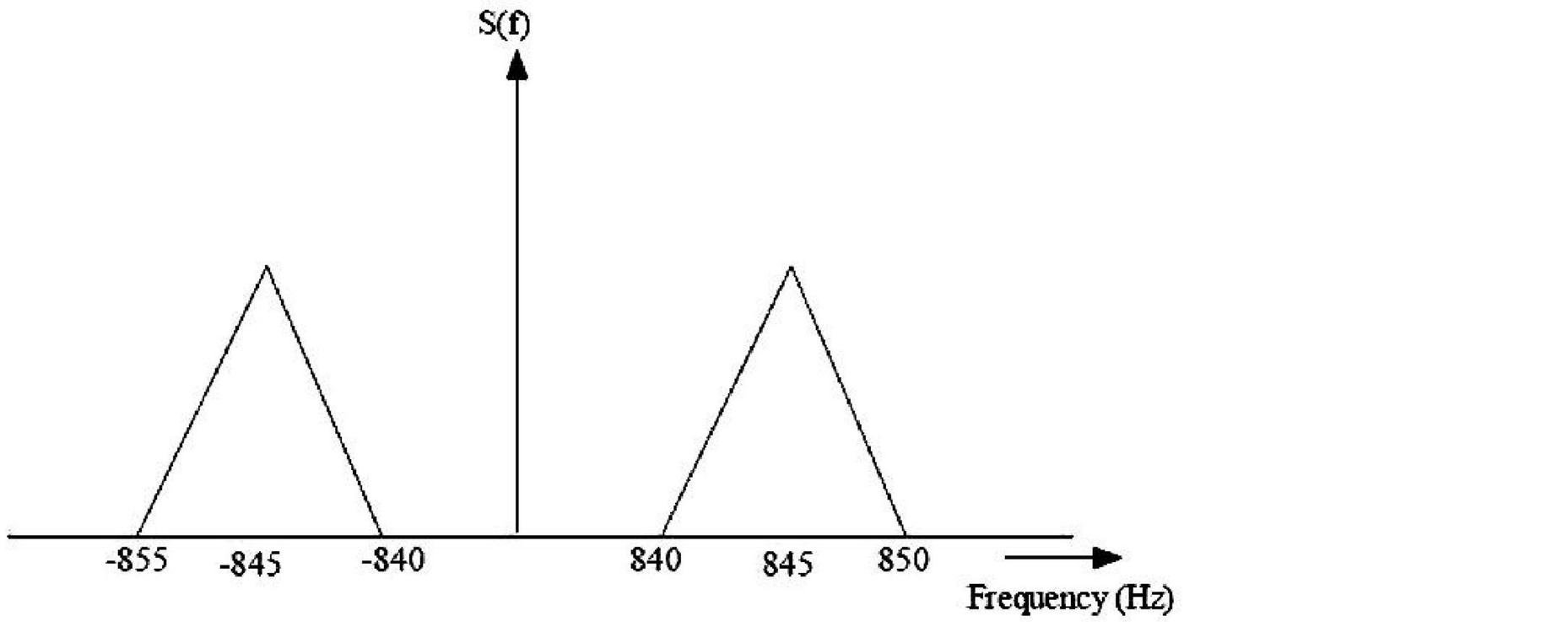
The message signal spectrum is shown in the figure is double side band suppressed carrier (DSB-SC) modulated by a sinusoidal carrier signal of frequency 845 kHz, then using a suitable ideal band pass filter it is converted to upper side band single side band suppressed carrier (SSB-SC) modulator. Which of the following spectrum represent corresponding SSB-SC modulated signal



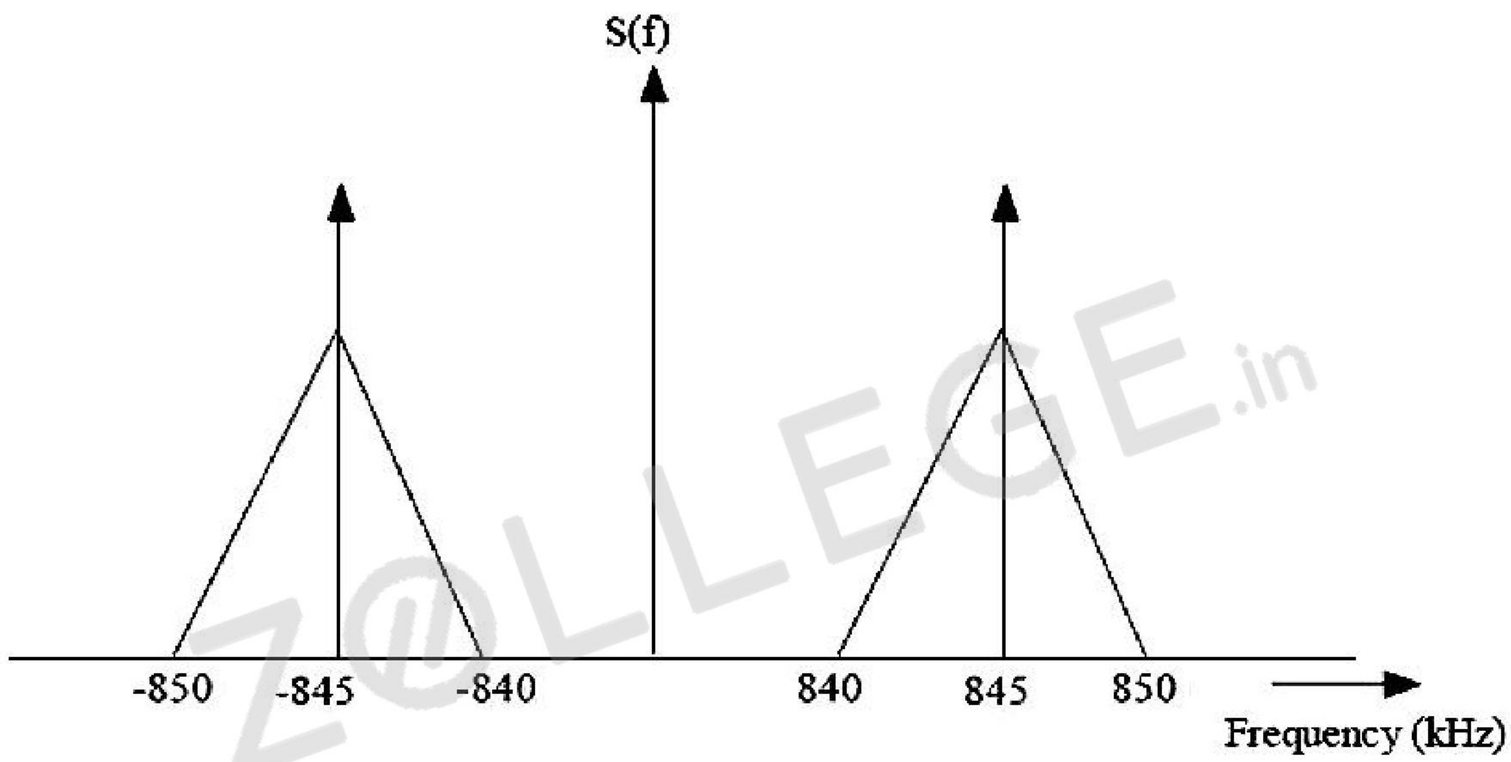
Options :

34058023109. ✗

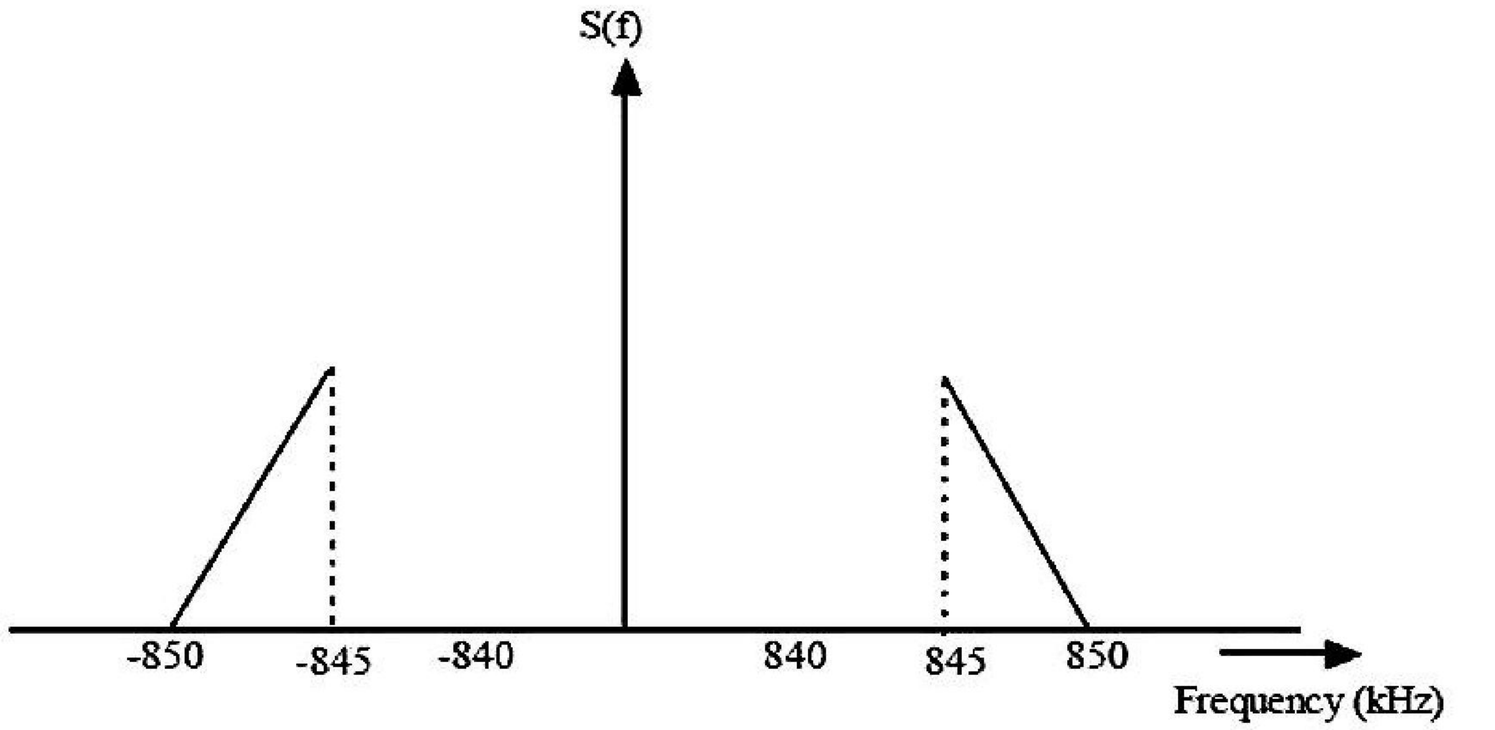
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34058023110. ✖

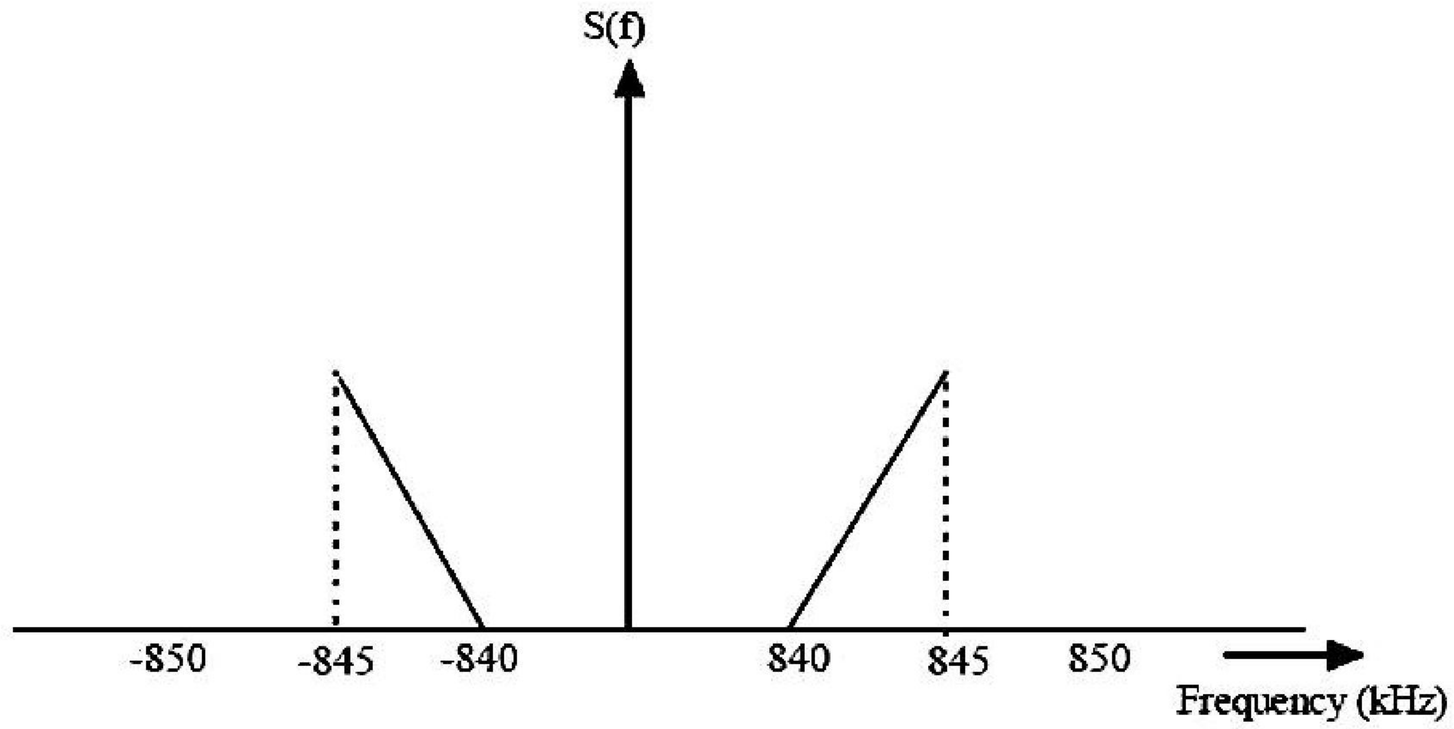


34058023111. ✔



34058023112. ✖

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Question Number : 19 Question Id : 3405805779 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If the number of bits in a pulse code modulation (PCM) system is increased from n to $n+1$, the improvement of signal to quantization noise ratio will be

Options :

34058023113. ✗ 3 dB

34058023114. ✓ 6 dB

34058023115. ✗ 2n dB

34058023116. ✗ 6n dB

Question Number : 20 Question Id : 3405805780 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

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A message signal consists of a maximum frequency *15 kHz* is used to generate a standard frequency modulation (FM) signal with a modulation index of *5*, the approximate bandwidth according to Carson's rule is

Options :

34058023117. ✓ 180 kHz

34058023118. ✗ 15 kHz

34058023119. ✗ 90 kHz

34058023120. ✗ 45 kHz

Question Number : 21 Question Id : 3405805781 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The auto correlation of *x(t)* can be evaluated using convolution as

Options :

34058023121. ✓ $R_X(\tau)=x(t)*x(-t)$

34058023122. ✗ $R_X(\tau)=x(-t)*x(-t)$

34058023123. ✗ $R_X(\tau)=x(t)*x(t)$

34058023124. ✗ $R_X(\tau)=x(-t)*x(-t+1)$

Question Number : 22 Question Id : 3405805782 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

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: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Two systems with impulse responses $h_1(t)$ and $h_2(t)$ are connected in cascade. Then the overall impulse response of the cascaded system is given as

Options :

34058023125. ✗ Product of $h_1(t)$ and $h_2(t)$

34058023126. ✗ Sum of $h_1(t)$ and $h_2(t)$

34058023127. ✓ Convolution of $h_1(t)$ and $h_2(t)$

34058023128. ✗ Difference of $h_1(t)$ and $h_2(t)$

Question Number : 23 Question Id : 3405805783 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

In FM signal with a modulation index m_f is passed through a frequency tripler. The wave in the output of the tripler will have a modulation index of

Options :

34058023129. ✗ m_f

34058023130. ✗ $m_f/3$

34058023131. ✓ $3m_f$

34058023132. ✗ $m_f/9$

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Question Number : 24 Question Id : 3405805784 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The slope overload error is associated with which of the following digital modulation schemes

Options :

34058023133. ✗ Pulse code modulation

34058023134. ✗ Differential pulse code modulation

34058023135. ✓ Delta modulation

34058023136. ✗ Adaptive delta modulation

Question Number : 25 Question Id : 3405805785 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which of the following impulse response corresponding to a linear phase finite impulse response (FIR) filter

Options :

34058023137. ✓ $h(n)=\{\underset{\uparrow}{3}, 2, 1, 2, 3\}$

34058023138. ✗ $h(n)=\{\underset{\uparrow}{5}, 7, 8, 5, 7\}$

34058023139. ✗ $h(n)=\{-2, -3, \underset{\uparrow}{1}, -2, -3\}$

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34058023140. ✖ $h(n)=\{\underset{\uparrow}{3},\ 2,\ 4,\ 5,\ 6\}$

Question Number : 26 Question Id : 3405805786 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A carrier is simultaneously amplitude modulated by a two sine waves having modulation indices of *0.6* and *0.8*. The overall modulation index will be

Options :

34058023141. ✖ 0.6

34058023142. ✖ 0.8

34058023143. ✖ 1.4

34058023144. ✔ 1

Question Number : 27 Question Id : 3405805787 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A memory system of size *128 k* bytes is to be designed using memory chips which have *14* address lines and *4* data lines each. The number of such chips required to design the memory system is

Options :

34058023145. ✖ 2

34058023146. ✖ 4

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34058023147. ✗ 8

34058023148. ✓ 16

Question Number : 28 Question Id : 3405805788 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which of the following Boolean equation cannot be simplified further

Options :

34058023149. ✗ $AB\bar{C}+A\bar{B}C+\bar{A}BC+ABC$

34058023150. ✓ $\bar{A}\bar{B}C+A\bar{B}\bar{C}+\bar{A}B\bar{C}+ABC$

34058023151. ✗ $ABC+ABC+ABC+ABC$

34058023152. ✗ $AB+\bar{A}BC+A\bar{B}C$

Question Number : 29 Question Id : 3405805789 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Using 2's complement, the largest positive and negative number which can be stored with *10* bits are

Options :

34058023153. ✗ -1024 to 1024

34058023154. ✗ -1024 to 1023

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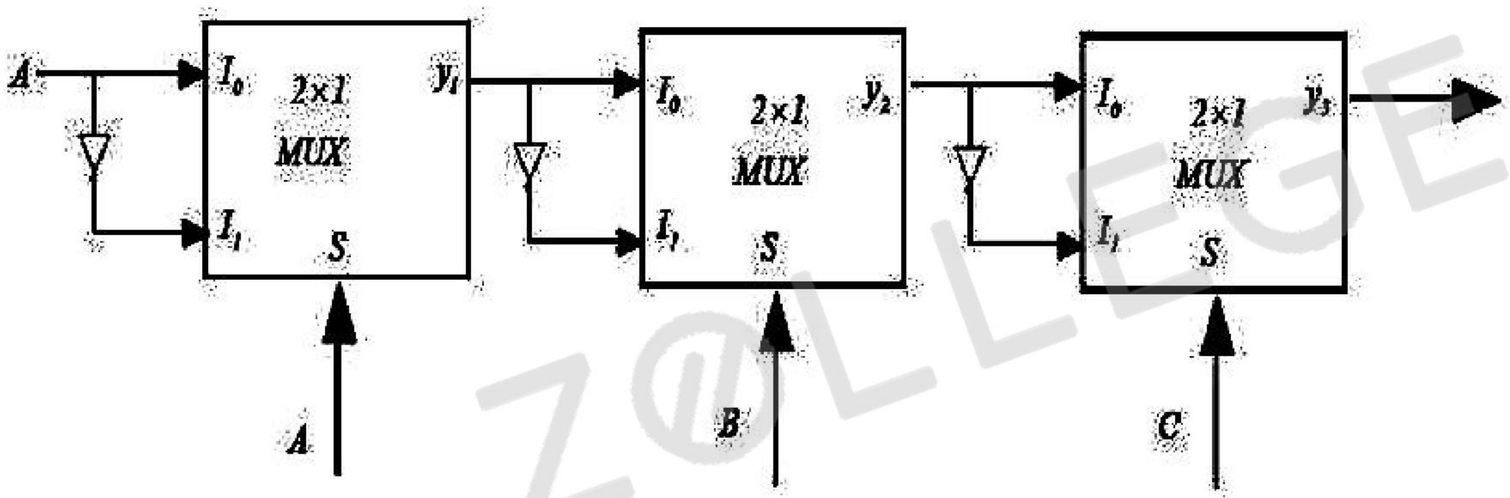
34058023155. ✓ -512 to 511

34058023156. ✗ -512 to 512

Question Number : 30 Question Id : 3405805790 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Obtain the Boolean equation for the following logic diagram.



Options :

34058023157. ✗ $A \oplus B \oplus C$

34058023158. ✓ 0

34058023159. ✗ 1

34058023160. ✗ $(A \oplus C)B$

Question Number : 31 Question Id : 3405805791 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

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For a typical computer it has 24-bit address lines, how much memory central processing unit (CPU) can address

Options :

34058023161. ✗ 24 MB

34058023162. ✗ 8 MB

34058023163. ✓ 16 MB

34058023164. ✗ 1 MB

Question Number : 32 Question Id : 3405805792 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which of the following logic family has a small propagation delay

Options :

34058023165. ✗ Transistor-transistor logic (TTL)

34058023166. ✓ Emitter coupled logic (ECL)

34058023167. ✗ Direct coupled transistor logic (DCTL)

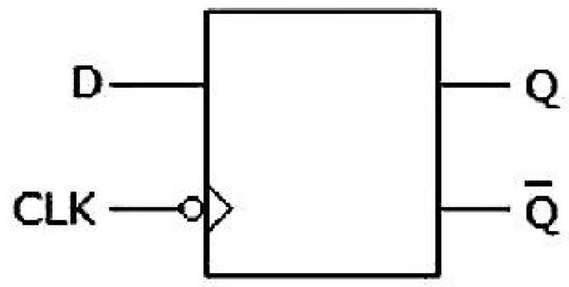
34058023168. ✗ Complementary metal oxide semiconductor (CMOS)

Question Number : 33 Question Id : 3405805793 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

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The functionality of the following flip flop is best explained as



Options :

34058023169. ✔ Output will be reflected when edge triggered pulse changing from high to low

34058023170. ✘ Output will be reflected when edge triggered pulse changing from low to high

34058023171. ✘ Output will be reflected at any time when edge triggered pulse in the low state

34058023172. ✘ Output will be reflected at any time when edge triggered pulse in the high state

Question Number : 34 Question Id : 3405805794 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Using four cascaded counters with a total of 16 bits, how many states must be deleted to achieve a modulus of 50,000

Options :

34058023173. ✘ 50,000

34058023174. ✘ 65,536

34058023175. ✘ 20,000

34058023176. ✔ 15,536

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Question Number : 35 Question Id : 3405805795 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If a mod-*12* and mod-*10* counters are cascaded then determine the output frequency if the input clock frequency is *240 MHz*

Options :

34058023177. ✗ 240 kHz

34058023178. ✗ 120 kHz

34058023179. ✗ 240 MHz

34058023180. ✓ 2 MHz

Question Number : 36 Question Id : 3405805796 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Suppose a microprocessor has memory locations from 0000 to 7FFF, each storing one byte. How many bytes the memory can store

Options :

34058023181. ✗ 65,536

34058023182. ✓ 32,768

34058023183. ✗ 16,384

34058023184. ✗ 8,192

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Question Number : 37 Question Id : 3405805797 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

How many times the loop will be executed for 8085 microprocessor

```
Loop : MVI C, 0Ah
       DEC C
       JNZ Loop
```

Options :

34058023185. ✗ 10 times

34058023186. ✗ 11 times

34058023187. ✗ 9 times

34058023188. ✓ ∞ times

Question Number : 38 Question Id : 3405805798 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which of the following memory has smallest access time

Options :

34058023189. ✗ RAM

34058023190. ✗ ROM

34058023191. ✓ Cache memory

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34058023192. ✖ Floppy disk

Question Number : 39 Question Id : 3405805799 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For the following mathematical operation find the radix of the number system.
$(12)_R + (23)_R = (40)_R$

Options :

34058023193. ✖ 10

34058023194. ✖ 7

34058023195. ✔ 5

34058023196. ✖ 3

Question Number : 40 Question Id : 3405805800 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The following switching functions are to be implemented using a suitable decoder
$f_1 = \sum m(1,2,5,7,9,11,14,19,25,26,29,31)$.The size of minimum suitable decoder is

Options :

34058023197. ✖ 2 to 4 line

34058023198. ✖ 3 to 8 line

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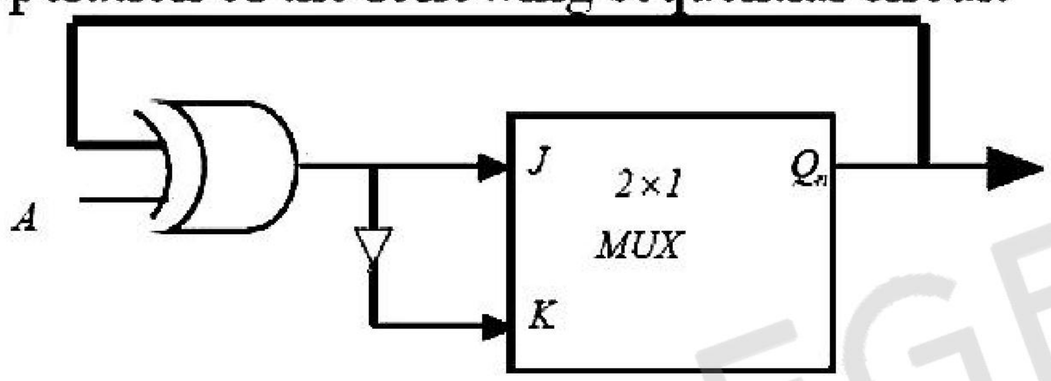
34058023199. ✗ 4 to 16 line

34058023200. ✓ 5 to 32 line

Question Number : 41 Question Id : 3405805801 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Identify the final operation of the following sequential circuit



Options :

34058023201. ✗ JK Flip flop

34058023202. ✓ D Flip flop

34058023203. ✗ T Flip flop

34058023204. ✗ SR Flip flop

Question Number : 42 Question Id : 3405805802 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

An n bit twisted ring counter repeats the count after how many clock cycles

Options :

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34058023205. ✓ 2n clock cycles

34058023206. ✗ n clock cycles

34058023207. ✗ 2n-1 clock cycles

34058023208. ✗ n-1 clock cycles

Question Number : 43 Question Id : 3405805803 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

After execution of the following programs contents of HL and DE register pair

```
LXI H, 1234 H
LXI D, 4321 H
DAD D
HLT
```

Options :

34058023209. ✗ (HL)=1234 H, (DE)=4321 H

34058023210. ✗ (HL)=4321 H, (DE)=4321 H

34058023211. ✗ (HL)=1234 H, (DE)=1234 H

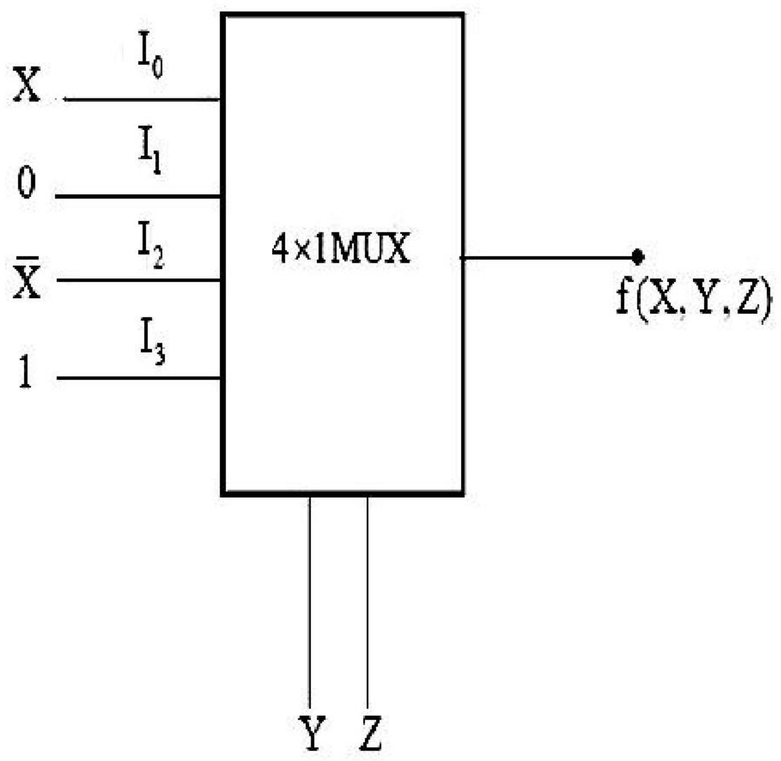
34058023212. ✓ (HL)=5555 H, (DE)=4321 H

Question Number : 44 Question Id : 3405805804 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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Correct Marks : 1 Wrong Marks : 0

A *4* to *1* multiplexer to realize a Boolean function *F(X, Y, Z)* is shown in the figure below. The canonical sum of products expression for *F(X, Y, Z)* is



Options :

34058023213. ✔ $\sum m(2,3,4,7)$

34058023214. ✘ $\sum m(1,3,5,7)$

34058023215. ✘ $\sum m(0,2,4,6)$

34058023216. ✘ $\sum m(2,3,5,6)$

Question Number : 45 Question Id : 3405805805 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

In the 8085 microprocessor which one of the following is the correct sequence of the machine cycles for the execution of the instruction *INC M* instruction

Options :

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34058023217. ✗ Opcode fetch

34058023218. ✓ Opcode fetch, memory read, memory write

34058023219. ✗ Opcode fetch, memory read

34058023220. ✗ Opcode fetch, memory write, memory read

Question Number : 46 Question Id : 3405805806 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The input impedance of the emitter follower circuit is for the parameters. $h_{ie}=1\ k\Omega$, $h_{fe}=99$, $R_E=1\ k\Omega$, $Rs=0\Omega$

Options :

34058023221. ✗ $10k\Omega$

34058023222. ✗ $9\ k\Omega$

34058023223. ✓ $101k\Omega$

34058023224. ✗ $98\ k\Omega$

Question Number : 47 Question Id : 3405805807 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For a typical *npn* transistor unity gain bandwidth product is $f_T=100\,MHz$ and $\alpha=0.99$, the alpha and beta cut-off frequencies f_α, f_β respectively are

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Options :

34058023225. ✖ $f_\alpha = 1000\,MHz,\ f_\beta = 10\,MHz$

34058023226. ✖ $f_\alpha = 10\,MHz,\ f_\beta = 1\,MHz$

34058023227. ✖ $f_\alpha = 100\,MHz,\ f_\beta = 100\,MHz$

34058023228. ✔ $f_\alpha = 101\,MHz,\ f_\beta = 1\,MHz$

Question Number : 48 Question Id : 3405805808 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The h-parameters of typical npn transistor are
$h_{ie} = 1.1k\,\Omega,\ h_{fe} = 50,\ h_{re} = 2.5\times10^{-5},\ h_{oe} = 24\,\mu A/V,\ R_L = 10\,k\,\Omega,$
for common emitter configuration the current gain (A_I), input impedance (Z_{in}) and voltage gain (A_V) are

Options :

34058023229. ✔ $A_I = -40.32,\ Z_{in} = 1k\Omega,\ A_V = -403.2$

34058023230. ✖ $A_I = -50,\ Z_{in} = 10\,k\Omega,\ A_V = -500$

34058023231. ✖ $A_I = -400.2,\ Z_{in} = 10\,k\Omega,\ A_V = -40.32$

34058023232. ✖ $A_I = -100,\ Z_{in} = 1k\Omega,\ A_V = -1000$

Question Number : 49 Question Id : 3405805809 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

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: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For the high pass circuit to act as a differentiator, the time constant must be

Options :

34058023233. ✔ Very small compared to time period of the signal

34058023234. ✘ Very high compared to time period of the signal

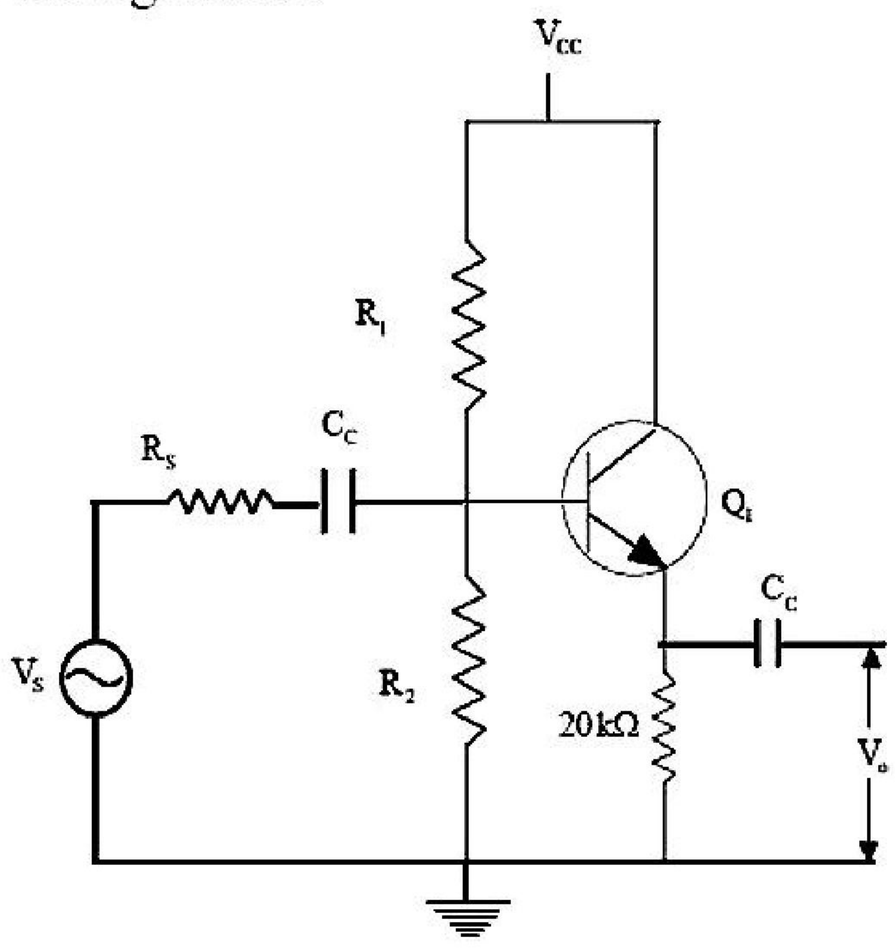
34058023235. ✘ Moderate

34058023236. ✘ Equal to time period of the signal

Question Number : 50 Question Id : 3405805810 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Identify the feedback configuration



Options :

34058023237. ✔ Voltage series

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34058023238. ✗ Current series

34058023239. ✗ Current shunt

34058023240. ✗ Voltage shunt

Question Number : 51 Question Id : 3405805811 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

An amplifier without feedback has a voltage gain of *100*, input impedance of *10 kΩ* and output impedance of *5 kΩ*. The input impedance and output impedance of the current series negative feedback amplifier using the above amplifier with a feedback factor of *0.1* respectively is

Options :

34058023241. ✓ $110k\Omega$ and $55k\Omega$

34058023242. ✗ $0.909k\Omega$ and 454Ω

34058023243. ✗ $110k\Omega$ and 454Ω

34058023244. ✗ $10k\Omega$ and $5k\Omega$

Question Number : 52 Question Id : 3405805812 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A Cascode amplifier pair consists of

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Options :

34058023245. ✗ Cascade of CB amplifier and CE amplifier

34058023246. ✗ Cascade of 2 CE amplifiers

34058023247. ✗ Cascade of 2 CC amplifiers

34058023248. ✓ Cascade of CE amplifier and CB amplifier

Question Number : 53 Question Id : 3405805813 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The presence of harmonic distortion in power amplifiers is because of

Options :

34058023249. ✗ Linear characteristics of active device

34058023250. ✓ Non Linear characteristics of active device

34058023251. ✗ Ideal characteristics of active device

34058023252. ✗ Time varying characteristics of active device

Question Number : 54 Question Id : 3405805814 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

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Three identical amplifiers with each one having a voltage gain of *5*, input resistance of *10 k*Ω and output resistance of *200*Ω are cascaded. The open circuit voltage gain of the cascaded amplifier is

Options :

34058023253. ✖ 15

34058023254. ✔ 125

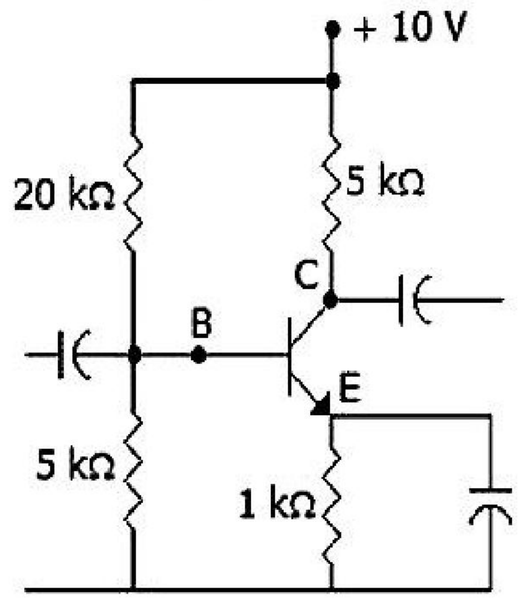
34058023255. ✖ 100

34058023256. ✖ 625

Question Number : 55 Question Id : 3405805815 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The stability factor (*S*) of the following self bias circuit is (Assume β=99)



Options :

34058023257. ✖ $S=100$

34058023258. ✖ $S=1$

34058023259. ✖ $S=49$

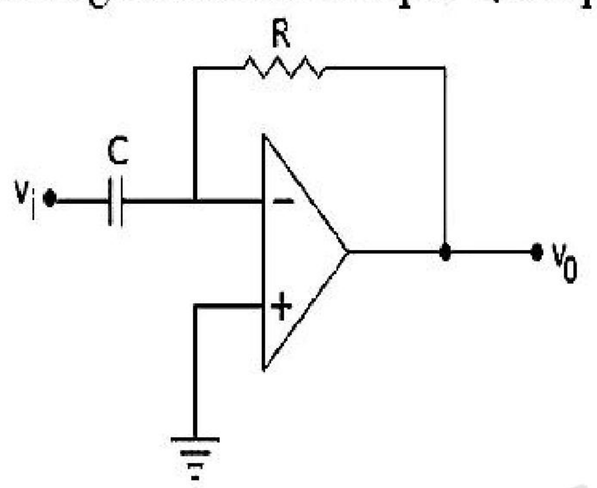
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34058023260. ✔ $S=4.8$

Question Number : 56 Question Id : 3405805816 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Assume that op-amp in the figure is ideal. If input V_i is square wave, the output V_0 will be



Options :

34058023261. ✖ Square wave

34058023262. ✖ Sine wave

34058023263. ✔ Impulse wave

34058023264. ✖ Parabolic wave

Question Number : 57 Question Id : 3405805817 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A particular green light emitting diode (LED) emits light of wavelength *5490 Å*, the energy band gap of the semiconductor material used there is; Plank's constant $h = 6.6 \times 10^{-34}$ J-sec

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Options :

34058023265. ✔ 2.24 eV

34058023266. ✖ 1.98 eV

34058023267. ✖ 1.17 eV

34058023268. ✖ 0.74 eV

Question Number : 58 Question Id : 3405805818 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

In an amplifier, if the output current flows for greater than 180° and less than 360°of the input cycle, then the class of amplifier will be

Options :

34058023269. ✖ Class A

34058023270. ✖ Class B

34058023271. ✖ Class C

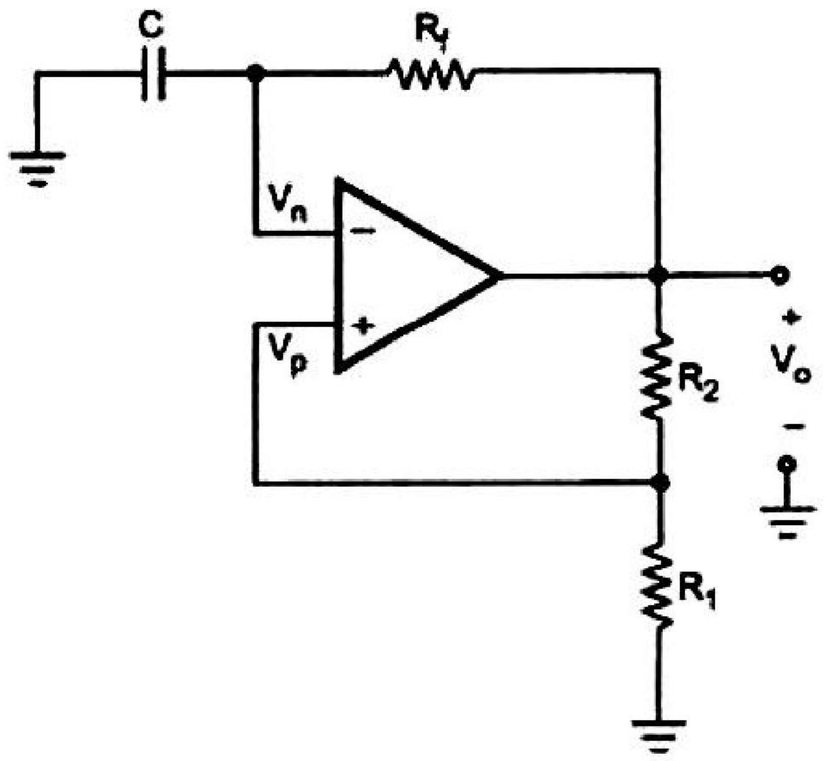
34058023272. ✔ Class AB

Question Number : 59 Question Id : 3405805819 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

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Identify the following operational amplifier circuit



Options :

34058023273. ✖ Non-inverting amplifier

34058023274. ✖ Logarithmic amplifier

34058023275. ✖ Schmitt Trigger

34058023276. ✔ Astable multi-vibrator

Question Number : 60 Question Id : 3405805820 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

In the following block diagram, what is the behaviour of the overall system



Options :

34058023277. ✖ Low pass filter

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34058023278. ✗ High pass filter

34058023279. ✗ Band pass filter

34058023280. ✓ All reject filter

Question Number : 61 Question Id : 3405805821 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

In a 555 astable multi vibrator, $R_1 = R_2 = 3.9k\Omega,, C = 0.1\mu F$, then its ON time, OFF time and duty cycle are

Options :

34058023281. ✓ $T_{ON} = 0.54\,ms; T_{OFF} = 0.27\,ms;\ Duty\ cycle = 66.66\%$

34058023282. ✗ $T_{ON} = 0.27\,ms; T_{OFF} = 0.54\,ms;\ Duty\ cycle = 33.33\%$

34058023283. ✗ $T_{ON} = 0.4\,ms; T_{OFF} = 0.2\,ms;\ Duty\ cycle = 66.66\%$

34058023284. ✗ $T_{ON} = 0.2\,ms; T_{OFF} = 0.4\,ms;\ Duty\ cycle = 33.33\%$

Question Number : 62 Question Id : 3405805822 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Johnson noise is caused by

Options :

34058023285. ✗ Thermal agitation of free electrons carrying current thereby modulating the current

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34058023286. ✗ Vibrations into circuit through conduct

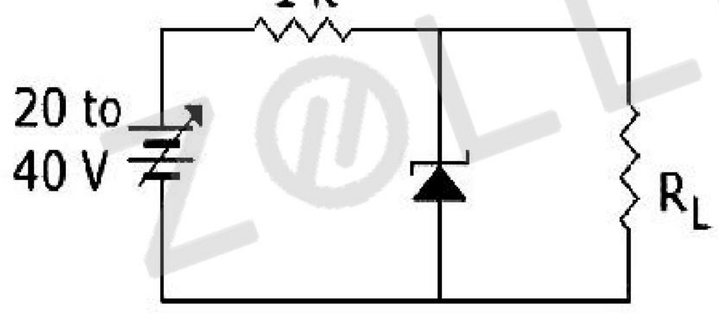
34058023287. ✓ Random emission of electrons across PN junction

34058023288. ✗ Electromagnetic radiation into the circuit

Question Number : 63 Question Id : 3405805823 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

In the following circuit diode is a 10 V zener diode. The minimum and maximum current through series resistance are



Options :

34058023289. ✓ *10 mA* and *30 mA*

34058023290. ✗ *20 mA* and *40 mA*

34058023291. ✗ *0* and *30 mA*

34058023292. ✗ *0* and *40 mA*

Question Number : 64 Question Id : 3405805824 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

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: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

An amplifier without any feedback has mid band voltage gain of *40 dB*, lower 3-dB frequency is *5 kHz* and upper 3-dB frequency *50 kHz*. If a *33%* negative feedback is introduced to the basic amplifier. The lower and upper 3-dB frequencies for the same amplifier with feedback are

Options :

34058023293. ✖ $f_{1f} = 300\,Hz; f_{2f} = 2\,MHz$

34058023294. ✔ $f_{1f} = 147\,Hz; f_{2f} = 1.7\,MHz$

34058023295. ✖ $f_{1f} = 1000\,Hz; f_{2f} = 20\,MHz$

34058023296. ✖ $f_{1f} = 3000\,Hz; f_{2f} = 0.2\,MHz$

Question Number : 65 Question Id : 3405805825 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Consider a germanium p-n junction at *300 °K*, with doping concentration $N_A = 1.5 \times 10^{18}\,cm^{-3}$ and $N_D = 2 \times 10^{15}\,cm^{-3}$ in p-side and n-sides of the junction respectively. Assume the intrinsic concentration of Ge $n_i = 2.5 \times 10^{13}\,cm^{-3}$ at *300 °K*. The contact potential across the junction is

Options :

34058023297. ✖ 0.658 V

34058023298. ✔ 0.398 V

34058023299. ✖ 0.7 V

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34058023300. ✖ 0.2 V

Question Number : 66 Question Id : 3405805826 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

In a multi stage amplifier configuration, the effective load impedance of 1st stage is

Options :

34058023301. ✖ Actual load resistance connected to the first stage

34058023302. ✖ Input impedance of the first stage

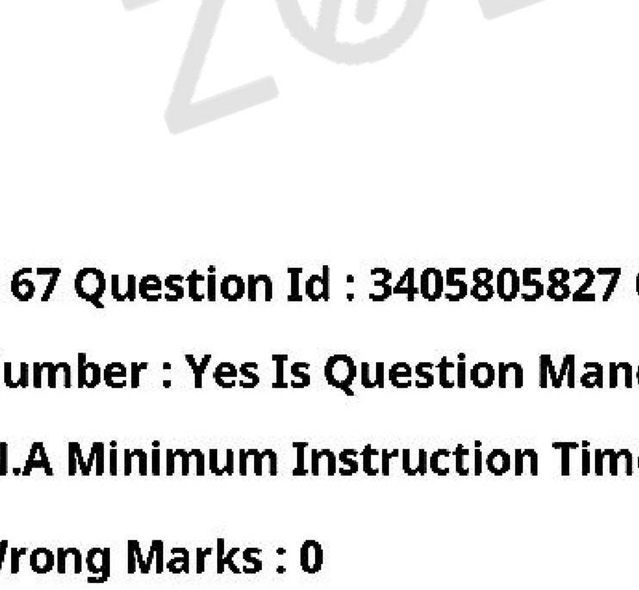
34058023303. ✖ Input impedance of second stage

34058023304. ✔ Parallel combination of actual load resistor and input impedance of the 2nd stage

Question Number : 67 Question Id : 3405805827 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The driving-point impedance $Z(s)$ of a network has a pole-zero locations as shown in the figure. If $Z(0) = 4$, then $Z(s)$ is



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Options :

34058023305. ✔ $Z(s)=\frac{10(s+2)}{(s^2+2s+5)}$

34058023306. ✘ $Z(s)=\frac{100(s+2)}{(s^3+3s+7)}$

34058023307. ✘ $Z(s)=\frac{(s+1)}{(s^2+4s+5)}$

34058023308. ✘ $Z(s)=\frac{100(s+3)}{(s^2+4s+5)}$

Question Number : 68 Question Id : 3405805828 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For a transmission line the open circuit and short circuit impedances are $200\ \Omega$ and $50\ \Omega$.
Then corresponding characteristic impedance is

Options :

34058023309. ✔ $100\ \Omega$

34058023310. ✘ $50\ \Omega$

34058023311. ✘ $10\ \Omega$

34058023312. ✘ $200\ \Omega$

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Question Number : 69 Question Id : 3405805829 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The impedance matrices of two, two-port network are given by $\begin{bmatrix} 6 & 1 \\ 1 & 6 \end{bmatrix}$ and $\begin{bmatrix} 10 & 4 \\ 4 & 20 \end{bmatrix}$. If these two networks are connected in series, the impedance matrix of the resulting two-port network will be

Options :

34058023313. ✗ $\begin{bmatrix} 4 & 3 \\ 3 & 14 \end{bmatrix}$

34058023314. ✓ $\begin{bmatrix} 16 & 5 \\ 5 & 26 \end{bmatrix}$

34058023315. ✗ $\begin{bmatrix} 60 & 4 \\ 4 & 120 \end{bmatrix}$

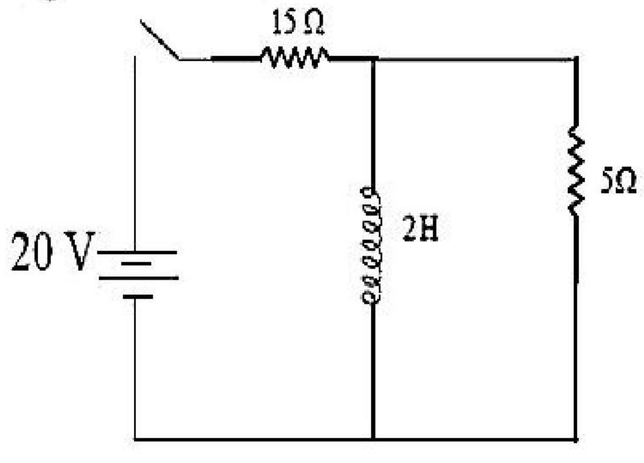
34058023316. ✗ $\begin{bmatrix} 6 & 1 \\ 1 & 6 \end{bmatrix}$

Question Number : 70 Question Id : 3405805830 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

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In the following switching circuit, the current supplied by the battery immediately after switching the circuit is



Options :

34058023317. ✖ 0 A

34058023318. ✔ 1 A

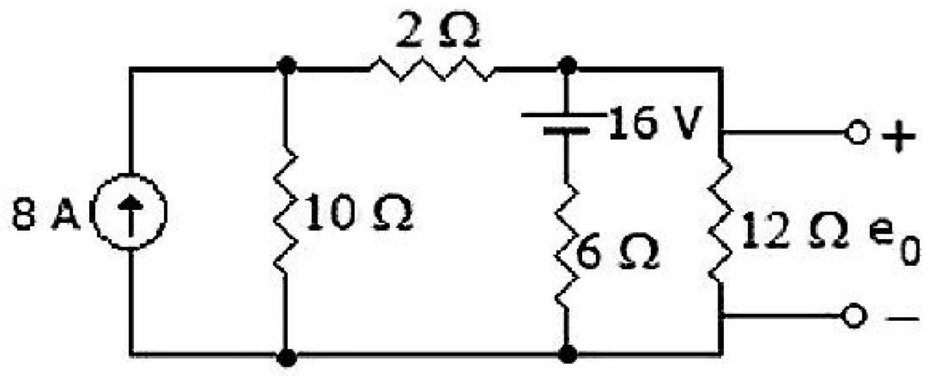
34058023319. ✖ 10 A

34058023320. ✖ 5 A

Question Number : 71 Question Id : 3405805831 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The voltage e_0 in the following circuit is



Options :

34058023321. ✖ 48 V

34058023322. ✖ 24 V

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34058023323. ✗ 36 V

34058023324. ✓ 28 V

Question Number : 72 Question Id : 3405805832 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

An RLC series circuit has quality factor $(Q) = 100$ and angular resonant frequency $(\omega_0) = 20\ rad/sec$. Then the bandwidth is

Options :

34058023325. ✓ 0.2 rad/sec

34058023326. ✗ 2 rad/sec

34058023327. ✗ 20 rad/sec

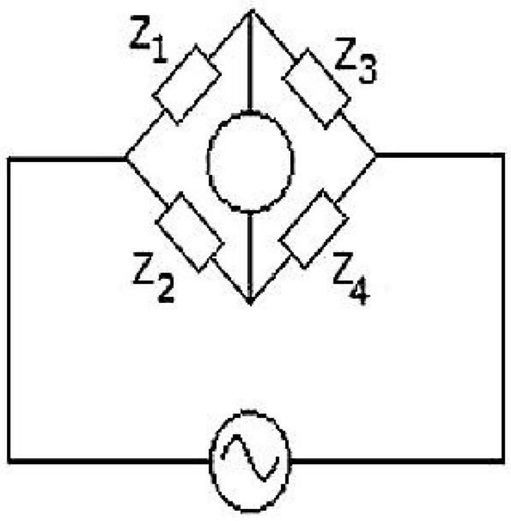
34058023328. ✗ 2000 rad/sec

Question Number : 73 Question Id : 3405805833 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

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The ac bridge shown in the figure is balanced if $Z_1 = 100\angle 30^\circ, Z_2 = 150\angle 0^\circ$, $Z_3 = 250\angle -40^\circ$ and Z_4 is equal to



Options :

34058023329. ✖ $Z_4 = 375\angle 70^\circ$

34058023330. ✔ $Z_4 = 375\angle -70^\circ$

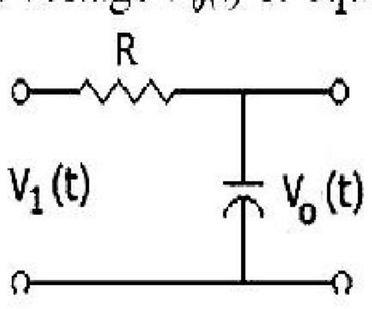
34058023331. ✖ $Z_4 = 150\angle 0^\circ$

34058023332. ✖ $Z_4 = 150\angle 20^\circ$

Question Number : 74 Question Id : 3405805834 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For the circuit shown in the figure, the time constant $RC = 1\ ms$, The input voltage is $V_1(t) = \sqrt{2}\ sin\ 10^3\ t$. The output voltage $V_0(t)$ is equal to



Options :

34058023333. ✔ $sin\ (10^3\ t - 45°)$

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34058023334. ✗ $sin\ (10^3\ t + 45°)$

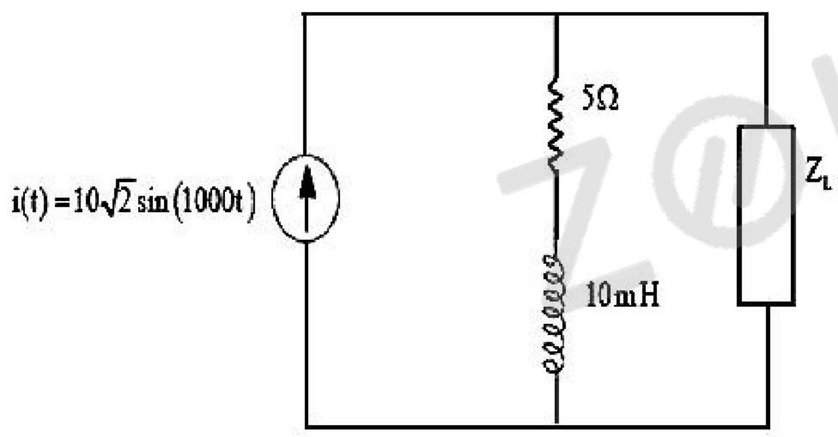
34058023335. ✗ $sin\ (10^3\ t - 53°)$

34058023336. ✗ $sin\ (10^3\ t + 53°)$

Question Number : 75 Question Id : 3405805835 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

In the circuit shown below the maximum power that can be transferred to load Z_L is



Options :

34058023337. ✗ 250 W

34058023338. ✗ 500 W

34058023339. ✓ 625 W

34058023340. ✗ 2000 W

Question Number : 76 Question Id : 3405805836 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

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: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A two-port network is represented by ABCD parameters given by

$$\begin{bmatrix} V_1 \\ I_1 \end{bmatrix} = \begin{bmatrix} A & B \\ C & D \end{bmatrix} \begin{bmatrix} V_2 \\ -I_2 \end{bmatrix}$$

If port is terminated by R_L, then input impedance seen at port 1 is given by

Options :

34058023341. ✖ $\frac{A + B R_L}{C + D R_L}$

34058023342. ✖ $\frac{A R_L + C}{B R_L + D}$

34058023343. ✖ $\frac{D R_L + A}{B R_L + C}$

34058023344. ✔ $\frac{B + A R_L}{D + C R_L}$

Question Number : 77 Question Id : 3405805837 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The transfer function of series RLC circuit is $\frac{V_0(s)}{V_i(s)} = H(s) = \frac{10^6}{s^2 + 20s + 10^6}$; then the quality factor of the circuit is

Options :

34058023345. ✖ 25

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34058023346. ✖ 100

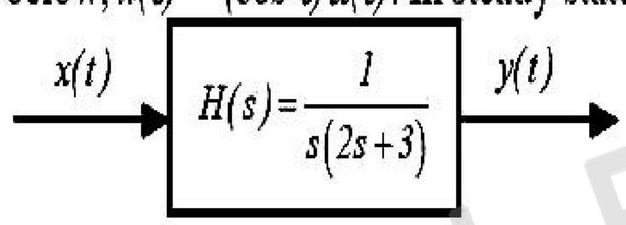
34058023347. ✔ 50

34058023348. ✖ 1000

Question Number : 78 Question Id : 3405805838 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

In the system shown in the figure below, $x(t) = (\cos t)u(t)$. In steady-state, the response $y(t)$ will be



Options :

34058023349. ✖ $y(t)=4\cos\left(t-120^{\circ}\right)$

34058023350. ✔ $y(t)=3.6\cos\left(t-156^{\circ}\right)$

34058023351. ✖ $y(t)=7.2\cos\left(t-16^{\circ}\right)$

34058023352. ✖ $y(t)=4.9\sin\left(t-56^{\circ}\right)$

Question Number : 79 Question Id : 3405805839 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For a stable system

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Options :

34058023353. ✖ Both phase and gain margin are negative

34058023354. ✔ Both phase and gain margin are positive

34058023355. ✖ Phase margin is positive but gain margin is negative

34058023356. ✖ Gain margin is positive but phase margin is negative

Question Number : 80 Question Id : 3405805840 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The phase crossover frequency of the transfer function $G(s)=\frac{1000}{(s+1)^4}$ in rad/s is

Options :

34058023357. ✖ $\sqrt{3}$

34058023358. ✖ $1/\sqrt{3}$

34058023359. ✔ 1

34058023360. ✖ $3\sqrt{3}$

Question Number : 81 Question Id : 3405805841 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

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A network has $\frac{s+1/T_1}{s+1/T_2}$. Then

Options :

34058023361. ✖ It is lead network

34058023362. ✖ It is lag network

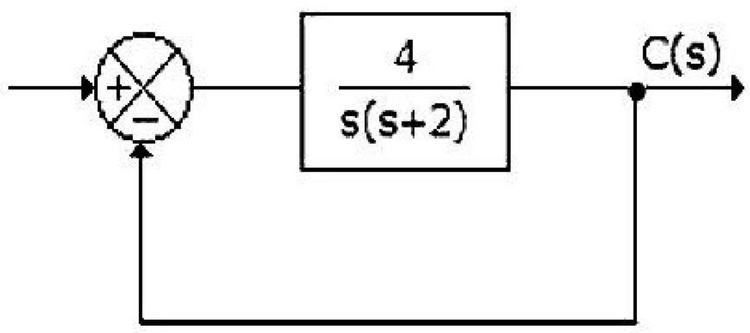
34058023363. ✔ It is lead network if $T_1 > T_2$ and lag network $T_1 < T_2$

34058023364. ✖ It is lead network if $T_1 < T_2$ and lag network $T_1 > T_2$

Question Number : 82 Question Id : 3405805842 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For the system of the given figure the closed loop poles are located at



Options :

34058023365. ✖ s=0 and s=-2

34058023366. ✖ $s = 0 \text{ and } -1 \pm j\sqrt{3}$

34058023367. ✔ $s = -1 \pm j\sqrt{3}$

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34058023368. ✖ $s=-2\ and\ -1\pm j\sqrt{3}$

Question Number : 83 Question Id : 3405805843 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For a first order system having transfer function $\frac{1}{1+sT}$, the unit step response

Options :

34058023369. ✔ $\left(1-e^{-\left(t/T\right)}\right)u(t)$

34058023370. ✖ $\left(e^{-\left(t/T\right)}\right)u(t)$

34058023371. ✖ $\left(-e^{-\left(t/T\right)}-1\right)u(t)$

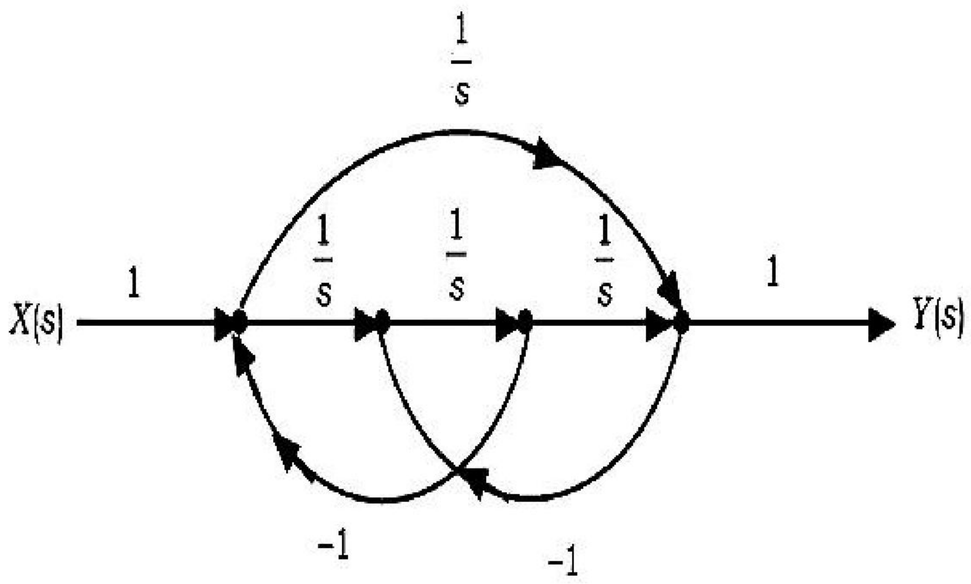
34058023372. ✖ $\left(1-e^{-\left(t/T\right)}\right)u(t)$

Question Number : 84 Question Id : 3405805844 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

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The signal flow graph representation of control system is shown in the figure, below. The transfer function is



Options :

34058023373. ✔ $H(s)=\frac{1}{s}$

34058023374. ✘ $H(s)=\frac{s^2+1}{s\left(s^2+2\right)}$

34058023375. ✘ $H(s)=\frac{s\left(s^2+1\right)}{s^2+2}$

34058023376. ✘ $H(s)=1-\frac{1}{s}$

Question Number : 85 Question Id : 3405805845 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A unity feedback system has a forward path transfer function $G(s)=\frac{100}{s(s+p)}$ The time at which the response to a unit step input reaches its peak is $\pi/8$ seconds. The value of damping coefficient and p value respectively are

Options :

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34058023377. ✗ $\zeta = 0.8;\ p = 16$

34058023378. ✗ $\zeta = 0.7;\ p = 14$

34058023379. ✓ $\zeta = 0.6;\ p = 12$

34058023380. ✗ $\zeta = 0.5;\ p = 10$

Question Number : 86 Question Id : 3405805846 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The value of a_0 which will ensure that the polynomial $s^3 + 3s^2 + 2s + a_0$ has roots on the left half of the s-plane is

Options :

34058023381. ✗ 11

34058023382. ✗ 9

34058023383. ✗ 7

34058023384. ✓ 5

Question Number : 87 Question Id : 3405805847 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

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A unity feedback system has the following open loop frequency response

$\omega(rad/sec)$	$\lvert G(j\omega)\rvert$	$\angle G(j\omega)$
2	7.5	-118°
3	4.8	-130°
4	3.15	-140°
5	2.25	-150°
6	1.70	-160°
8	1.00	-170°
10	0.64	-180°

The gain and phase margin of the system are

Options :

34058023385. ✖ $0\ dB, -180^{\circ}$

34058023386. ✖ $7\ dB, -170^{\circ}$

34058023387. ✔ $3.88\ dB, 10^{\circ}$

34058023388. ✖ $10\ dB, 20^{\circ}$

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Question Number : 88 Question Id : 3405805848 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A linear time-invariant single input single output system has a state space model given by

$$\frac{dx}{dt} = Fx + Gu;\ y = Hx$$

Where $F = \begin{bmatrix} 0 & -1 \\ 4 & -2 \end{bmatrix}; G = \begin{bmatrix} 0 \\ 4 \end{bmatrix}; H = \begin{bmatrix} 1 & 0 \end{bmatrix}$

Here, s is the state vector, u is the input and y is output.
The damping ratio of the system is

Options :

34058023389. ✗ 0.25

34058023390. ✓ 0.5

34058023391. ✗ 1

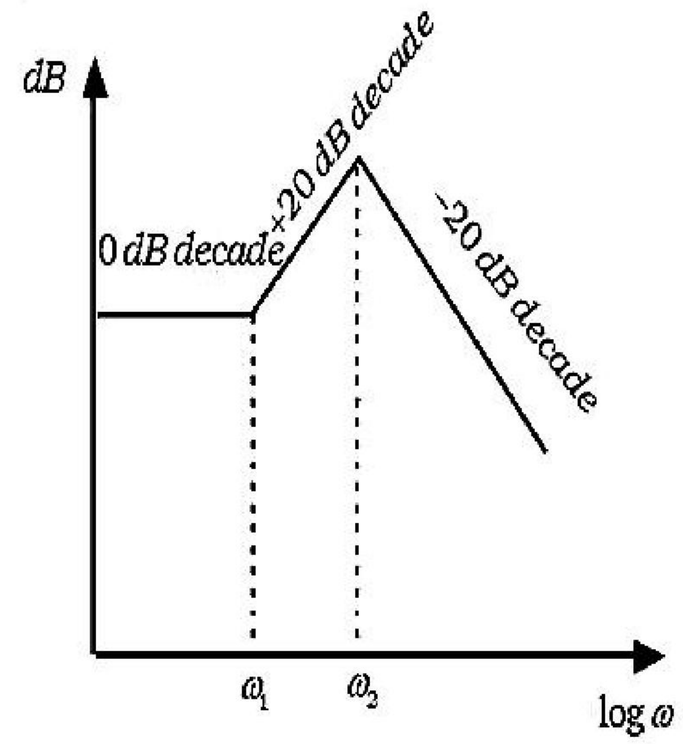
34058023392. ✗ 2

Question Number : 89 Question Id : 3405805849 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

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The Bode asymptotic plot of a transfer function is given below. In the frequency range shown, the transfer function has



Options :

34058023393. ✗ 3 poles and 1 zero

34058023394. ✗ 1 pole and 2 zero

34058023395. ✓ 2 poles and 1 zero

34058023396. ✗ 2 poles and 2 zeros

Question Number : 90 Question Id : 3405805850 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A $3\frac{1}{2}$, *200 mV* full scale digital voltmeter has an accuracy specification of ±*0.5 %* of reading plus *5* counts. When the meter reads *100 mV*, the voltage being measured as

Options :

34058023397. ✗ Any value between 99.5 mV and 100.5 mV

34058023398. ✓ Any value between 99.0 mV and 101 mV

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34058023399. ✖ Exactly 99.5 mV

34058023400. ✖ Exactly 100 mV

Question Number : 91 Question Id : 3405805851 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

An electronic voltmeter consisting of a full wave precision and an average circuit gives correct root mean square (RMS) value for square wave inputs. Its reading for a $2\ V$ peak to peak sinusoidal will be

Options :

34058023401. ✔ $\frac{2}{\pi}V$

34058023402. ✖ $\frac{1}{\pi}V$

34058023403. ✖ $\frac{2}{\sqrt{2\pi}}V$

34058023404. ✖ $\frac{\sqrt{2}}{\pi}V$

Question Number : 92 Question Id : 3405805852 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

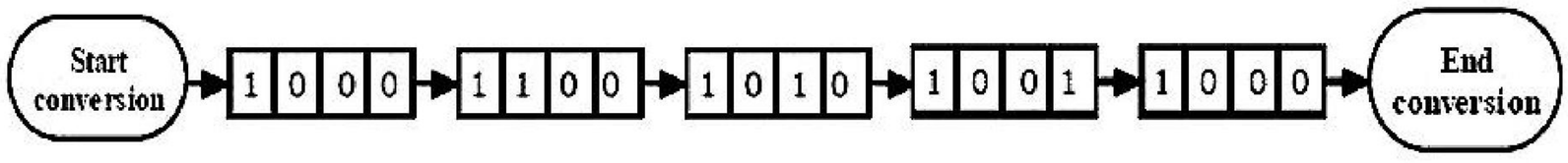
Correct Marks : 1 Wrong Marks : 0

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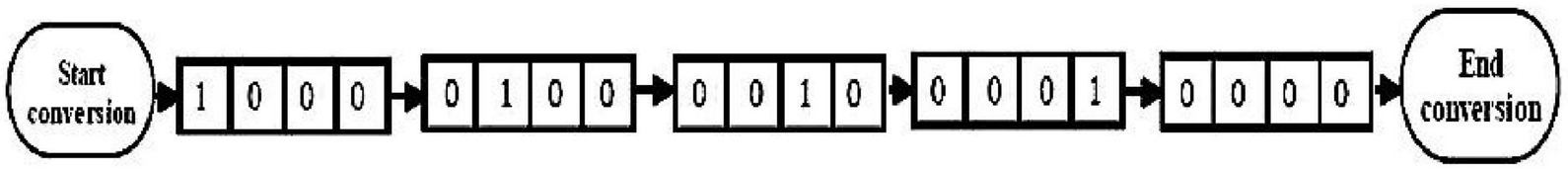
A 4 bit successive approximation type analog to digital converter (ADC) has a full scale value of *15 V*. The sequence of the states, the successive approximation register (SAR) will traverse, for the conversion of an input of *9 V* is

Options :

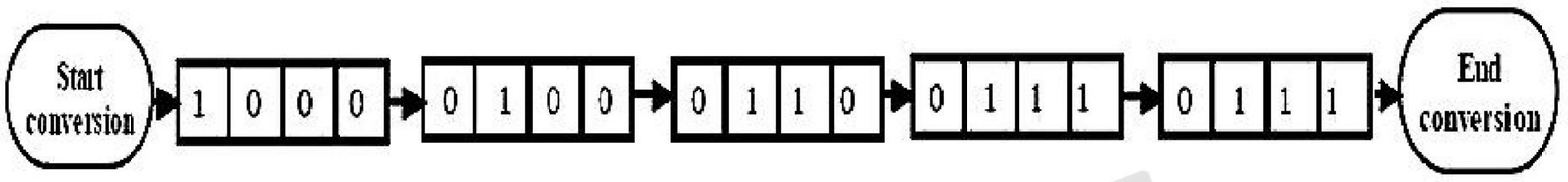
34058023405. ✗



34058023406. ✗



34058023407. ✗



34058023408. ✓



Question Number : 93 Question Id : 3405805853 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A moving coil instrument has a resistance of *0.5 Ω* and a full scale deflection of *0.1A*. To convert it into an ammeter of *0-10A*, the shunt resistance should be

Options :

34058023409. ✗ $0.004\ \Omega$

34058023410. ✓ $0.005\ \Omega$

34058023411. ✗ $0.05\ \Omega$

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34058023412. ✖ $0.1\ \Omega$

Question Number : 94 Question Id : 3405805854 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The bridge most suited for measurement of a four terminal resistance in the range of *0.001* Ω to *0.1* Ω is

Options :

34058023413. ✖ Wein's bridge

34058023414. ✔ Kelvin double bridge

34058023415. ✖ Maxwell's bridge

34058023416. ✖ Schering bridge

Question Number : 95 Question Id : 3405805855 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A very low-loss coil is tested with a *Q*-meter and the distributed (self) capacitance of the coil is found to be *820 pF*. Resonance occurred at an angular frequency ω of 10^6 rad/s with a capacitance of *9.18 nF*. The inductance of the coil is

Options :

34058023417. ✖ *100 pH*

34058023418. ✔ *100 μH*

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34058023419. ✗ $100\ nH$

34058023420. ✗ $100\ mH$

Question Number : 96 Question Id : 3405805856 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The two-wattmeter method is used to measure power in a balanced 3-phase circuit, drawing lagging current. The power factor if one of the wattmeter reads zero is

Options :

34058023421. ✓ 0.5

34058023422. ✗ 0.8

34058023423. ✗ 1.0

34058023424. ✗ 0.0

Question Number : 97 Question Id : 3405805857 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The input impedance of a cathode ray oscilloscope (CRO) is equivalent to a $1M\ \Omega$ resistance in parallel with a $45\ pF$ capacitance. It is used with a compensated 10 to 1 attenuation probe. The effective input capacitance at the probe tip is

Options :

34058023425. ✓ 4.5 pF

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34058023426. ✖ 5 pF

34058023427. ✖ 45 pF

34058023428. ✖ 450 pF

Question Number : 98 Question Id : 3405805858 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The Lissajous pattern observed on screen of CRO is a straight line inclined at $45°$ to x axis. If X-plate input is $2 \sin \omega t$, the Y-plate input is

Options :

34058023429. ✔ $2 \sin \omega t$

34058023430. ✖ $2 \sin (\omega t + 45°)$

34058023431. ✖ $2 \sin (\omega t - 45°)$

34058023432. ✖ $2.818 \sin (\omega t + 45°)$

Question Number : 99 Question Id : 3405805859 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The resistance of a $125\ \Omega$ strain gauge changes by $1\ ohm$ for 4000 micro strain. The gauge factor is

Options :

34058023433. ✖ 1.5

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34058023434. ✔ 2

34058023435. ✖ 2.5

34058023436. ✖ 3

Question Number : 100 Question Id : 3405805860 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A piezoelectric force transducer has a charge sensitivity of *20 pC/N*. It is connected to a charge amplifier and overall gain of transducer and amplifier is *50 mV/N*. The gain of amplifier is

Options :

34058023437. ✖ 1 mV/pC

34058023438. ✖ 1.5 mV/pC

34058023439. ✔ 2.5 mV/pC

34058023440. ✖ 4 mV/pC

Question Number : 101 Question Id : 3405805861 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

IR spectroscopy

Options :

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34058023441. ✗ Has a useful range of radiation from 2.5 to 15 microns

34058023442. ✗ Is unsuitable for analysis of mixture of metals

34058023443. ✗ Is unsuitable for analysis of organic gases

34058023444. ✓ Uses bolometer as one of the detectors

Question Number : 102 Question Id : 3405805862 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Two sensors have measurement errors that are Gaussian distributed with zero means and variances σ_1^2 and σ_2^2 respectively. The two sensor measurements x_1 and x_2 are combined to form the weighted average $x = \alpha x_1 + (1-\alpha)x_2$. Assuming that the measurement errors of the two sensors are uncorrelated, the weighting factor α that yields the smallest error variance of x is

Options :

34058023445. ✓ $\frac{\sigma_2^2}{\sigma_2^2 + \sigma_1^2}$

34058023446. ✗ $\frac{\sigma_1^2}{\sigma_2^2 + \sigma_1^2}$

34058023447. ✗ $\frac{\sigma_1}{\sigma_2^2 + \sigma_1^2}$

34058023448. ✗ $\frac{\sigma_2}{\sigma_2^2 + \sigma_1^2}$

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Question Number : 103 Question Id : 3405805863 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The maximum solid angle of acceptance of light coupled into a step index fibre having core and cladding refractive indices *1.48* and *1.45* respectively is

Options :

34058023449. ✓ 0.28 steradins

34058023450. ✗ 0.30 steradins

34058023451. ✗ 0.32 steradins

34058023452. ✗ 0.34 steradins

Question Number : 104 Question Id : 3405805864 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For a change in elevation level of $1.5\mu m$ between an optical flat and a surface, a light wave of wavelength $0.5\ \mu m$ produces fringes. The number of fringes is

Options :

34058023453. ✗ 3

34058023454. ✓ 6

34058023455. ✗ 9

34058023456. ✗ 12

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Question Number : 105 Question Id : 3405805865 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A strain gauge is attached to a bar of length *20 cm* which is subjected to a tensile force. The nominal resistance of strain gauge is *100 Ω*. The changes in resistance and elongation in the bar measured are *0.35 Ω* and *0.2 mm* respectively. The Gauge factor of the strain gauge is

Options :

34058023457. ✖ 2

34058023458. ✔ 3.5

34058023459. ✖ 10

34058023460. ✖ 100

Question Number : 106 Question Id : 3405805866 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The expression for the capacitance (C in pF) of a parallel plate capacitor is given as $C = 6.94 \times 10^{-3}\left(\frac{d^2}{S}\right)$. The diameter ($d$) of each plate is 20 mm and spacing between the plates (S) is *0.25 mm*. The displacement sensitivity of the capacitor approximately

Options :

34058023461. ✖ 44.4 pF/mm

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34058023462. ✓ -44.4 pF/mm

34058023463. ✗ 11.1 pF/mm

34058023464. ✗ -11.1 pF/mm

Question Number : 107 Question Id : 3405805867 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

To reduce the effect of fringing in a capacitive type transducer

Options :

34058023465. ✗ The transducer is shielded and the shield is kept at ground potential

34058023466. ✓ A guard ring is provided and it is kept at ground potential

34058023467. ✗ The transducer is shielded and the shield is kept at the same potential as the moving plate

34058023468. ✗ A guard ring is provided and is kept at the same potential as the moving plate

Question Number : 108 Question Id : 3405805868 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A mercury barometer reads h mm Hg with the temperature of the mercury at $T^{\circ}C$. The barometer reading corrected for standard temperature $0^{\circ}C$ with β denoting the volumetric expansion coefficient of mercury in $0^{\circ}C$, is

Options :

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34058023469. ✗ $\frac{h}{1+\beta T}$

34058023470. ✗ $h(\beta+T)$

34058023471. ✓ $h(1+\beta T)$

34058023472. ✗ $h(\beta-T)$

Question Number : 109 Question Id : 3405805869 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A differential pressure transmitter is used to measure the flow rate in a pipe. Due to ageing, the sensitivity of the pressure transmitter is reduced by 6%. All other aspects of the flow meter remaining constant, change in the sensitivity of flow measurement is

Options :

34058023473. ✗ 10%

34058023474. ✗ 5%

34058023475. ✗ 2.5%

34058023476. ✓ 3 %

Question Number : 110 Question Id : 3405805870 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

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Liquid flow rate is measured using

Options :

34058023477. ✗ A Pirani gauge

34058023478. ✗ A pyrometer

34058023479. ✓ An orifice plate

34058023480. ✗ A Bourdon tube

Question Number : 111 Question Id : 3405805871 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A shaft encoder attached to a DC motor has a sensitivity of *500* pulses per revolution. A frequency meter connected to the output of encoder indicates the frequency to be *5500 Hz*. The speed of motor in RPM is

Options :

34058023481. ✗ 110

34058023482. ✗ 220

34058023483. ✗ 550

34058023484. ✓ 660

Question Number : 112 Question Id : 3405805872 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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Correct Marks : 1 Wrong Marks : 0

The relationship between the force $f(t)$ and the displacement $x(t)$ of a spring-mass system (with a mass M, viscous damping D and spring constant K) is

$$M\frac{d^2x(t)}{dt^2}+D\frac{dx(t)}{dt}+Kx(t)=f(t)$$

$X(s)$ and $F(s)$ are the Laplace transforms of $x(t)$ and $f(t)$ respectively.

With $M=0.1$, $D=2$, $K=10$ in appropriate units. The transfer function $\frac{X(s)}{F(s)}$ is

Options :

34058023485. ✔ $\frac{10}{s^2+20s+100}$

34058023486. ✘ $s^2+20s+100$

34058023487. ✘ $\frac{10s^2}{s^2+20s+100}$

34058023488. ✘ $\frac{s}{s^2+20s+100}$

Question Number : 113 Question Id : 3405805873 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The Sound Pressure Level (SPL) measured in open space (free filed), at a distance of 6 m from a noise source is 80 dB. At a distance of 60 m, the SPL is

Options :

34058023489. ✘ 80 dB

34058023490. ✔ 60 dB

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34058023491. ✗ 8 dB

34058023492. ✗ 1.34 dB

Question Number : 114 Question Id : 3405805874 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A He-Ne laser of cavity length *500 nm* has an oscillating bandwidth of *1500 MHz*. The maximum number of longitudinal oscillating modes that is accommodated within the bandwidth is

Options :

34058023493. ✗ 4

34058023494. ✓ 5

34058023495. ✗ 30

34058023496. ✗ 40

Question Number : 115 Question Id : 3405805875 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

An LED emitting at *1 μm* with a spectral width of *50 nm* is used in a Michelson interferometer. To obtain a sustained interference, the maximum optical path difference between the two arms of the interferometer is

Options :

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34058023497. ✗ 200 μm

34058023498. ✓ 20 μm

34058023499. ✗ 1 μm

34058023500. ✗ 50 nm

Question Number : 116 Question Id : 3405805876 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The relative permittivity of an optical medium is 2.5. Its refractive index is

Options :

34058023501. ✗ 0.4

34058023502. ✓ 1.25

34058023503. ✗ 1.58

34058023504. ✗ 1.6

Question Number : 117 Question Id : 3405805877 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The resolving power of a spectrometer consisting of a collimator, grating and a telescope can be increased by

Options :

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34058023505. ✗ Increasing the angular magnification of telescope

34058023506. ✗ Increasing the period of grating

34058023507. ✓ Decreasing the period of grating

34058023508. ✗ Decreasing the slit-width of the collimator

Question Number : 118 Question Id : 3405805878 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The transmittance of a coloured solution is 0.5. The absorbance of the solution is

Options :

34058023509. ✓ 0.3010

34058023510. ✗ 0.6930

34058023511. ✗ 3.1605

34058023512. ✗ -1.5238

Question Number : 119 Question Id : 3405805879 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For an ECG amplifier the input signal is 100 μV corrupted by a common mode noise of 5 mV. The output of the amplifier contains 50 mV of signal and 0.001 mV. The CMRR of the amplifier is

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Options :

34058023513. ✖ 43 dB

34058023514. ✖ 67 dB

34058023515. ✖ 88 dB

34058023516. ✔ 128 dB

Question Number : 120 Question Id : 3405805880 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A single sensor, contact type ultrasonic flaw detector uses a frequency of *330 kHz*, when testing a specimen, an echo from a flaw is recorded *0.05 ms* after the transmitted pulse. If the velocity of sound in the test object is *6 km/s* then the flaw is at a depth of

Options :

34058023517. ✖ 120 cm

34058023518. ✖ 60 cm

34058023519. ✖ 30 cm

34058023520. ✔ 15 cm

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