

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

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

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

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

Options :

34058023045. ✖ 4

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

$$\int_0^1 \int_0^1 (x^3y + x^2y^2 + xy^3) dz dy dx =$$

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

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

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. ✗ $2\pi i$

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. ✔ $\sqrt{6}$

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

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 $x[n] = n^2 [u[n-1] - u[n-50]]$ 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

: 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 $x(n)=\{1, 2, 1-j, 2+j, 5\}$. Let $X(e^{j\omega})$ denote the discrete-time Fourier Transform of $x[n]$. The value of $\int_{-\pi}^{\pi} X(e^{j\omega}) d\omega$ is

Options :

34058023089. ✖ 1

34058023090. ✖ 0

34058023091. ✔ 2π

34058023092. ✖ 10π

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

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

$h_2(n) = \{a, -b, c, -b, a\}$ 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. ✘ $\frac{1}{9} < |z| < \frac{2}{9}$

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 :

34058023105. ✖ Non-causal and un-stable

34058023106. ✖ Non-causal and stable

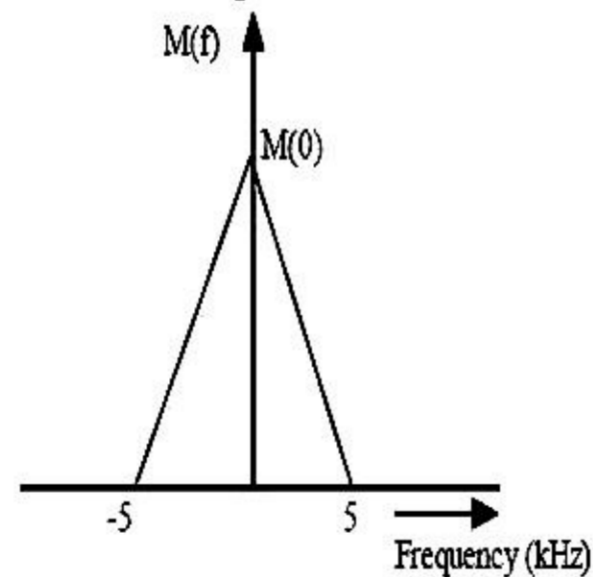
34058023107. ✖ Causal and un-stable

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

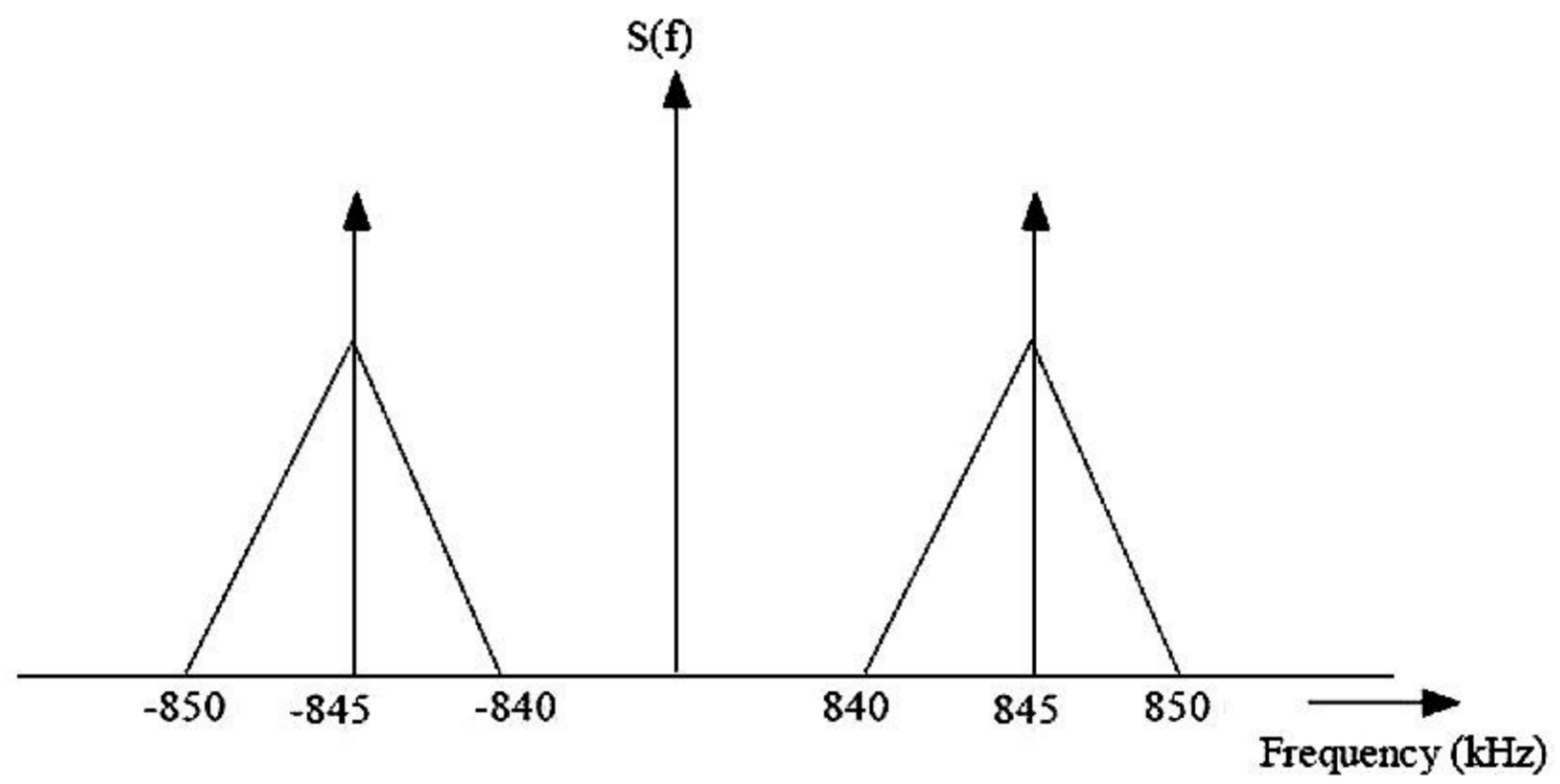
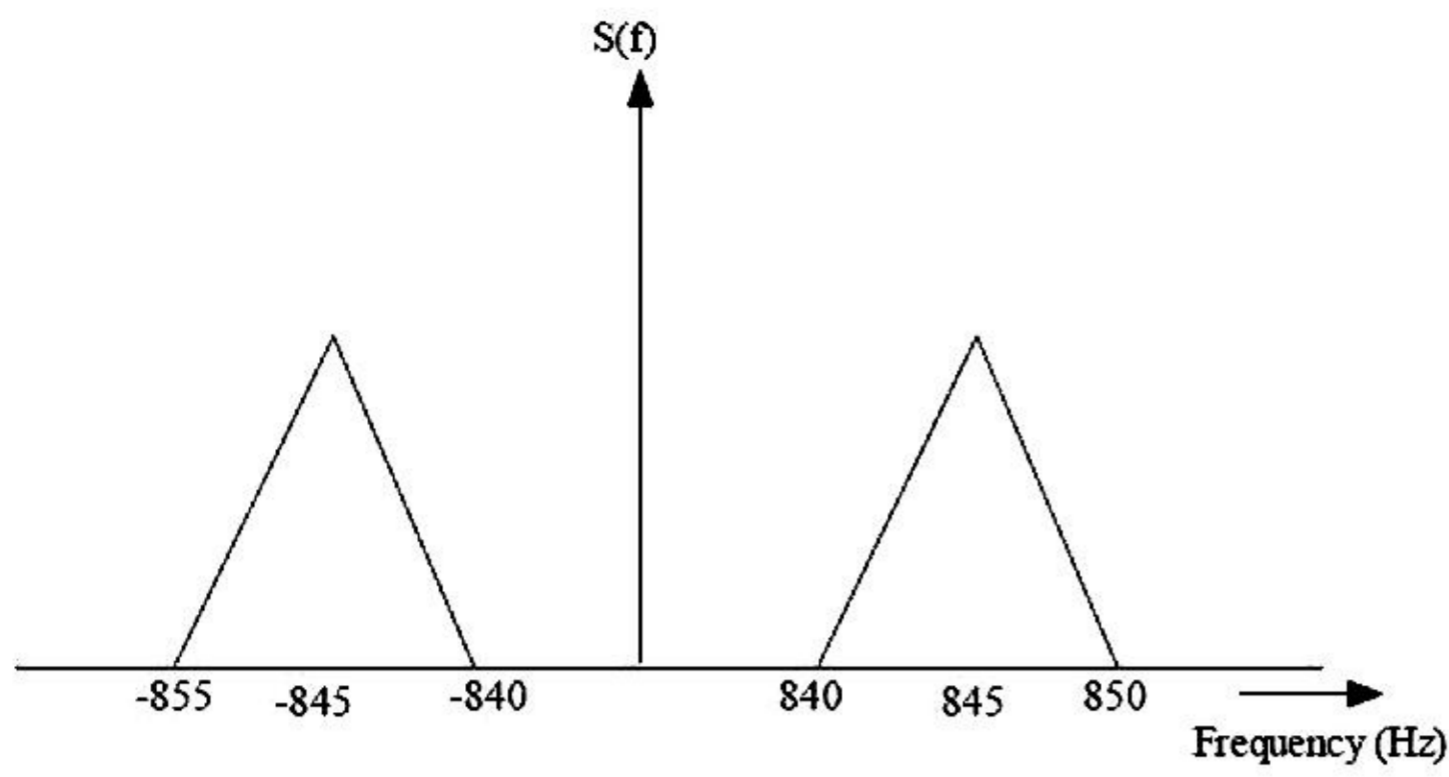
Correct Marks : 1 Wrong Marks : 0

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

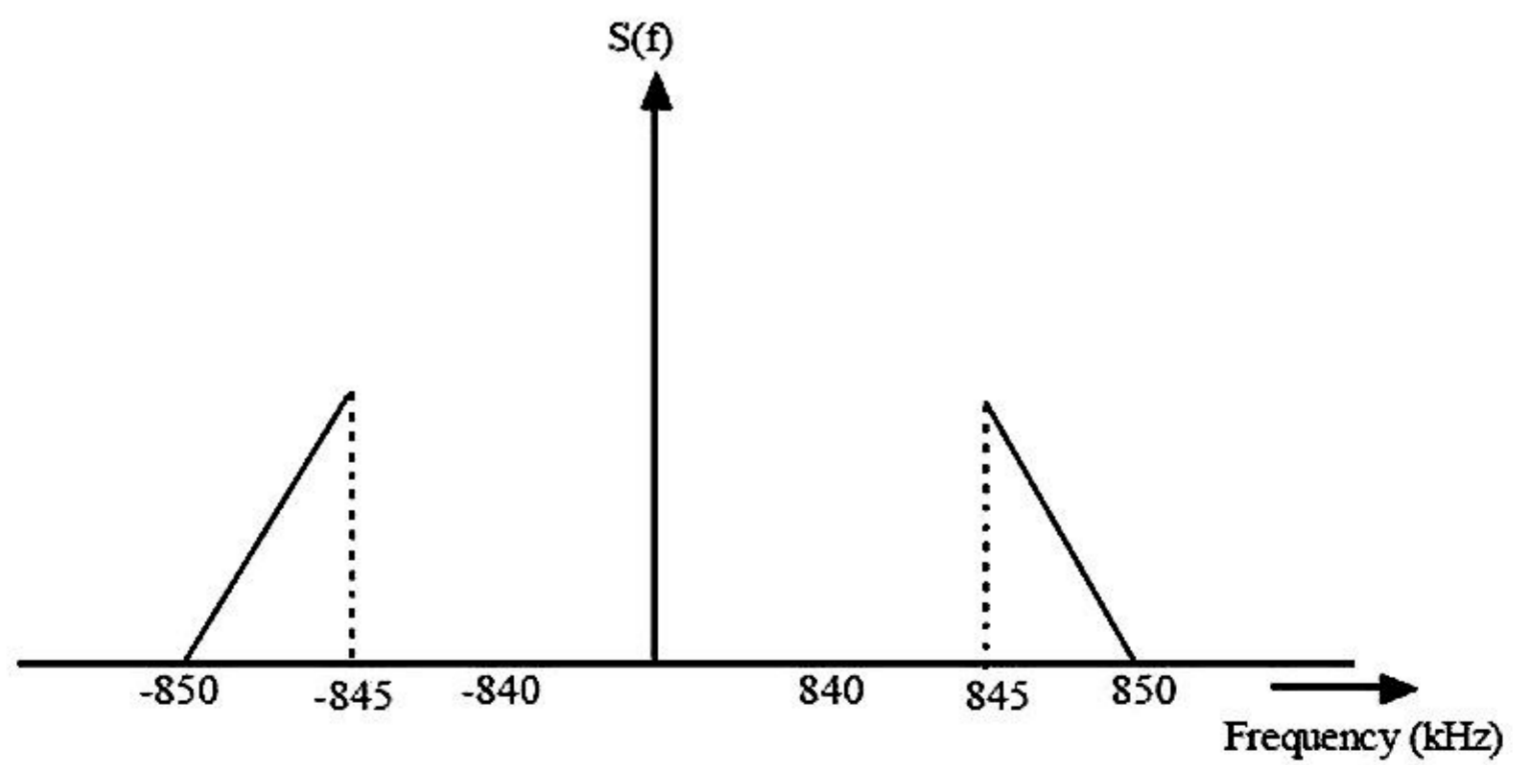


Options :

34058023109. ✖

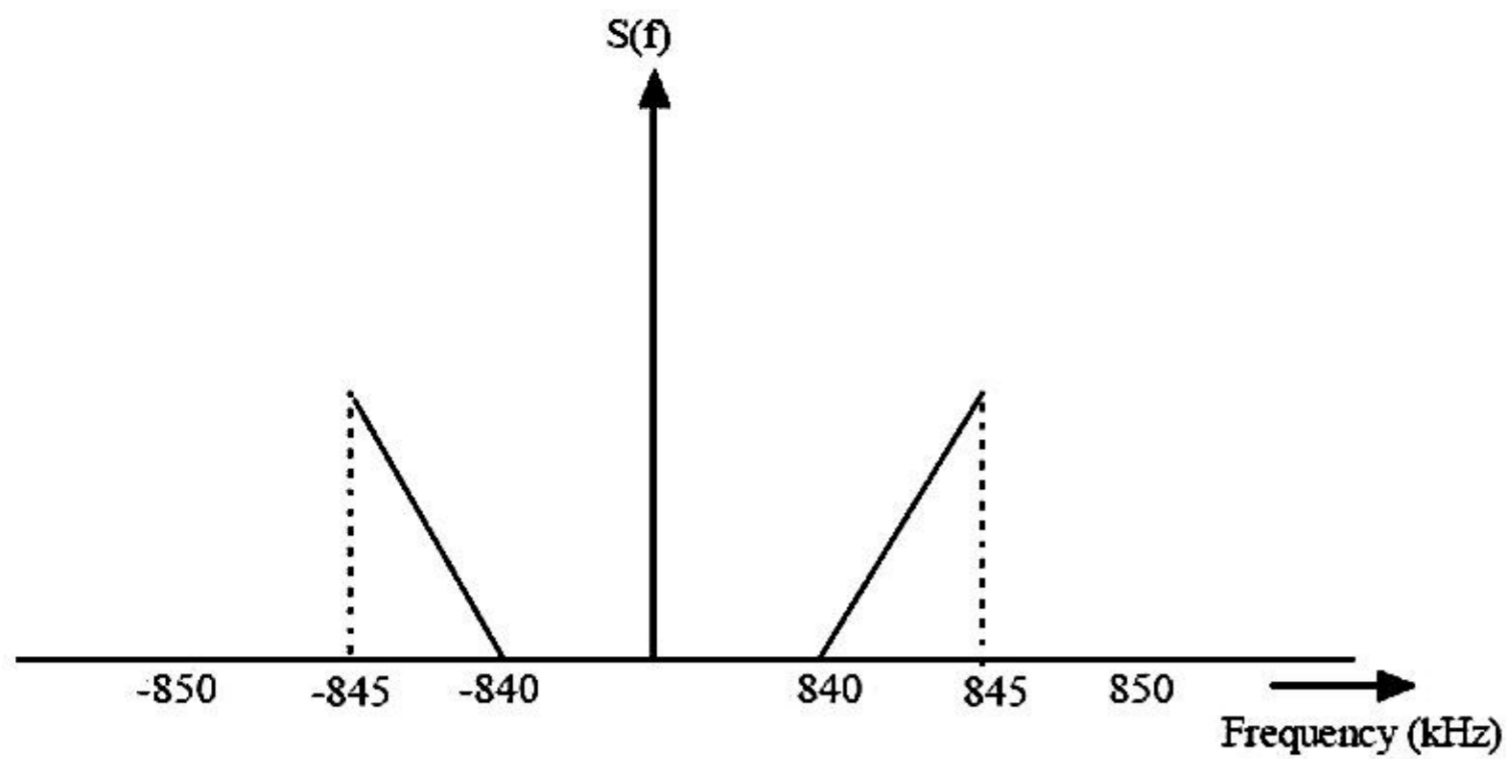


34058023110. ✖



34058023111. ✔

34058023112. ✖



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

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

: 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. ✖ $m_f/9$

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. ✔ $h(n) = \left\{ \underset{\uparrow}{3}, 2, 1, 2, 3 \right\}$

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

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

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

**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

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. ✖ $ABC + \bar{A}\bar{B}C + A\bar{B}\bar{C} + \bar{A}B\bar{C}$

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

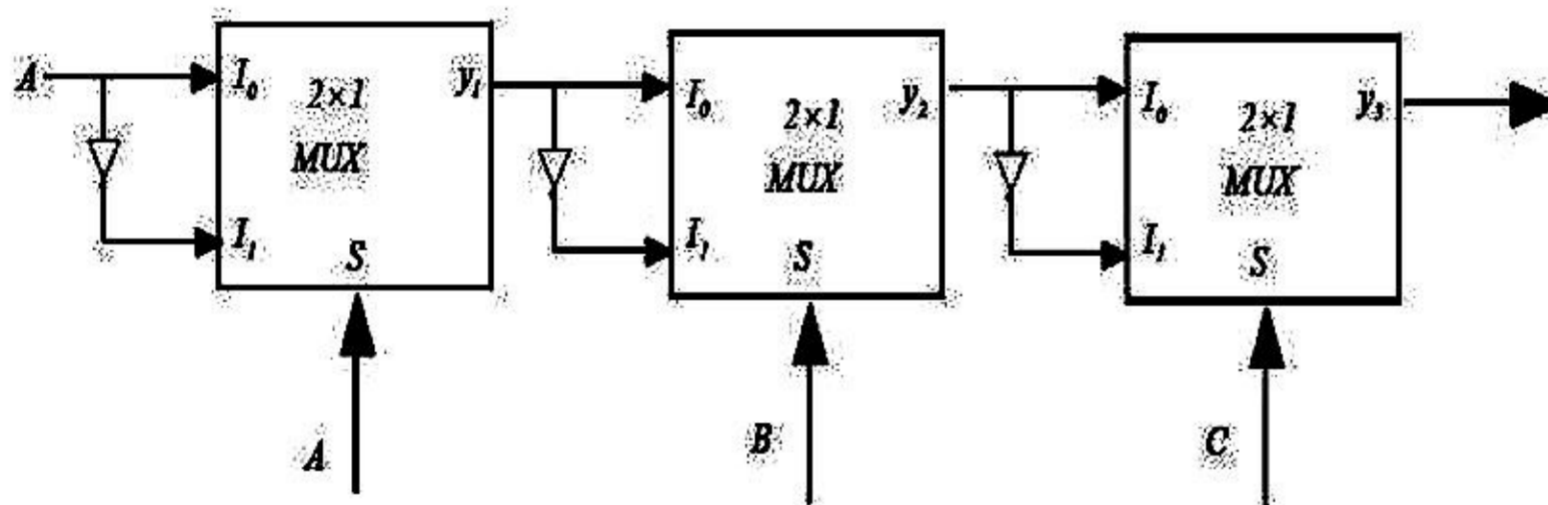
34058023154. ✖ -1024 to 1023

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. ✘ I

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

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)

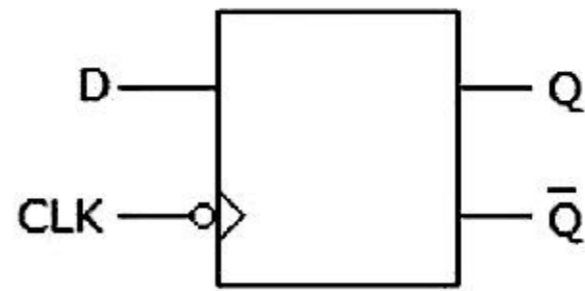
34058023167. ✖ Direct coupled transistor logic (DCTL)

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

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

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

**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

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

$$f_1 = \sum m(1, 2, 5, 7, 9, 11, 14, 19, 25, 26, 29, 31). \text{The size of minimum suitable decoder is}$$

Options :

34058023197. ✖ 2 to 4 line

34058023198. ✖ 3 to 8 line

34058023199. ✖ 4 to 16 line

34058023200. ✔ 5 to 32 line

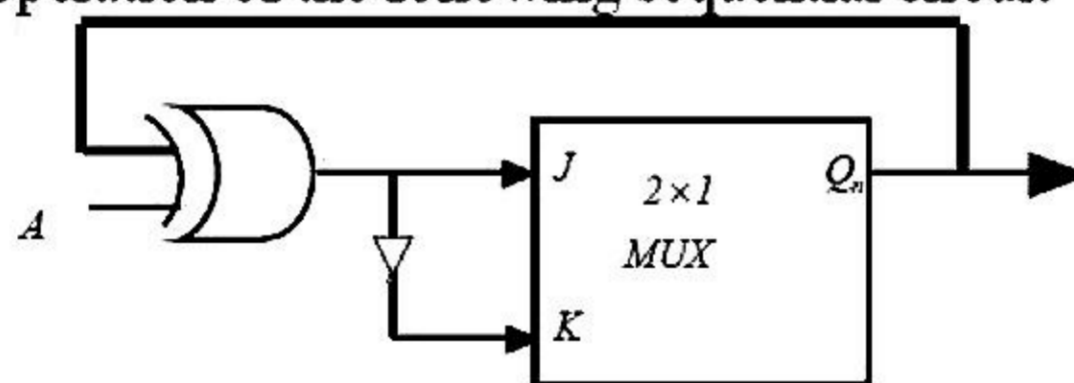
Question Number : 41 Question Id : 3405805801 Question Type : MCQ Option Shuffling : Yes

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 :

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

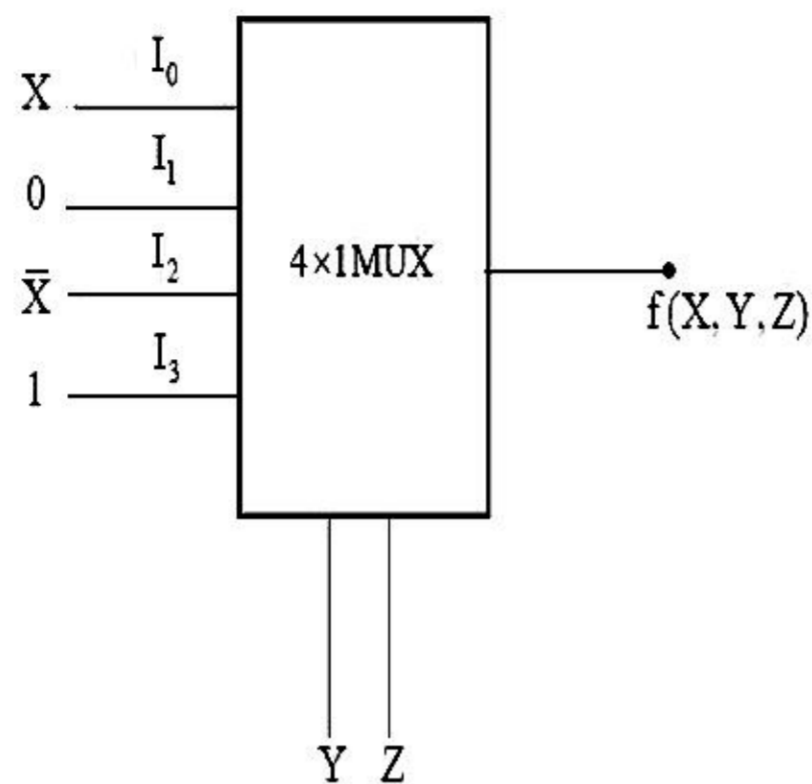
34058023211. ✗ (HL)=1234 H, (DE)=1234 H

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**

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 :

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. $h_{ie}=1\text{ k}\Omega$,
 $h_{fe}=99$, $R_E=1\text{ k}\Omega$, $R_S=0\Omega$

Options :

34058023221. ✖ $10\text{k}\Omega$

34058023222. ✖ $9\text{ k}\Omega$

34058023223. ✔ $101\text{k}\Omega$

34058023224. ✖ $98\text{ k}\Omega$

**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 $f_T=100\text{ MHz}$ and $\alpha=0.99$, the
alpha and beta cut-off frequencies f_α , f_β respectively are

Options :

34058023225. ✖ $f_{\alpha} = 1000 \text{ M Hz}, f_{\beta} = 10 \text{ M Hz}$

34058023226. ✖ $f_{\alpha} = 10 \text{ M Hz}, f_{\beta} = 1 \text{ M Hz}$

34058023227. ✖ $f_{\alpha} = 100 \text{ M Hz}, f_{\beta} = 100 \text{ M Hz}$

34058023228. ✔ $f_{\alpha} = 101 \text{ M Hz}, f_{\beta} = 1 \text{ M Hz}$

**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

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

Options :

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

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

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

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

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

: 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

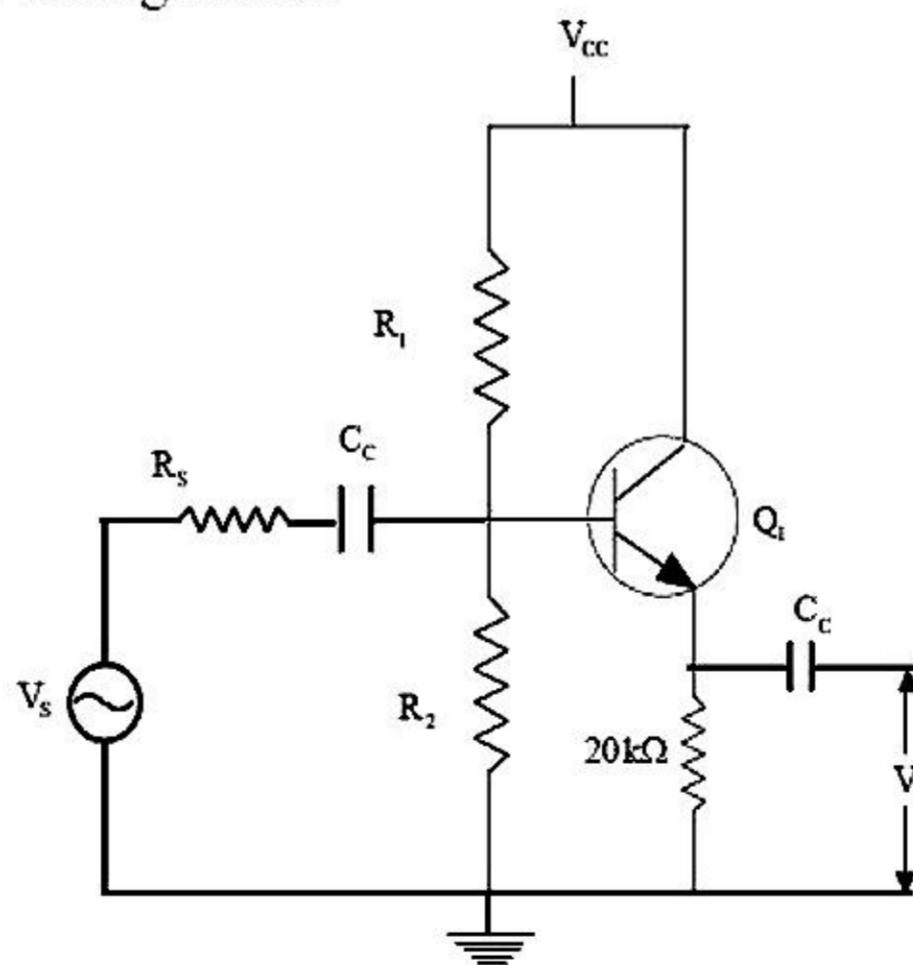
Question Number : 50 Question Id : 3405805810 Question Type : MCQ Option Shuffling : Yes

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

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 $10\text{ k}\Omega$ and output impedance of $5\text{ k}\Omega$. 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. ✔ $110\text{ k}\Omega$ and $55\text{ k}\Omega$

34058023242. ✖ $0.909\text{ k}\Omega$ and 454Ω

34058023243. ✖ $110\text{ k}\Omega$ and 454Ω

34058023244. ✖ $10\text{ k}\Omega$ and $5\text{ k}\Omega$

**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

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

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

Options :

34058023253. ✖ 15

34058023254. ✔ 125

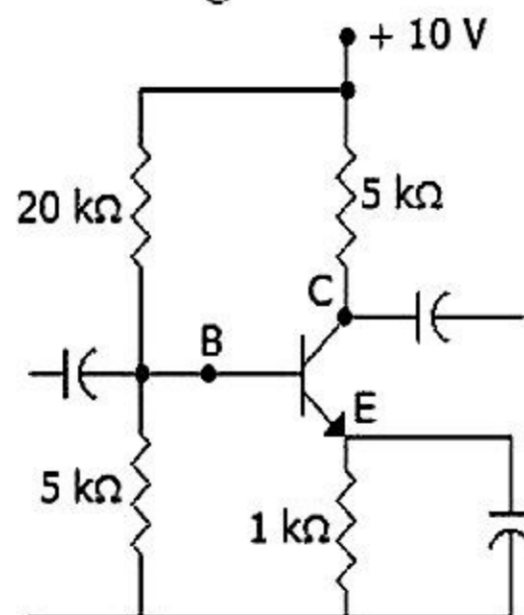
34058023255. ✖ 100

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 $\beta=99$)



Options :

34058023257. ✖ $S=100$

34058023258. ✖ $S=1$

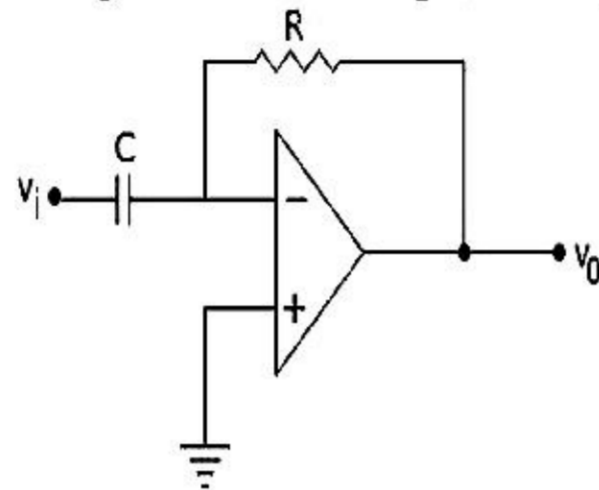
34058023259. ✖ $S=49$

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_o 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 \AA , the energy band gap of the semiconductor material used there is; Plank's constant $h = 6.6 \times 10^{-34} \text{ J-sec}$

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

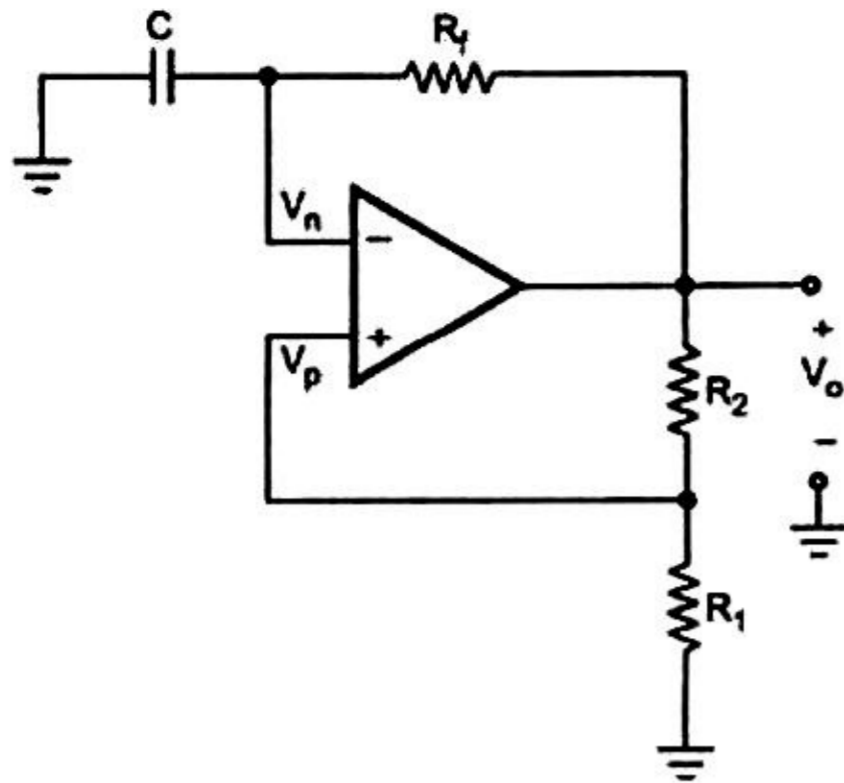
34058023271. ✗ Class C

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

Identify the following operational amplifier circuit



Options :

34058023273. ✘ Non-inverting amplifier

34058023274. ✘ Logarithmic amplifier

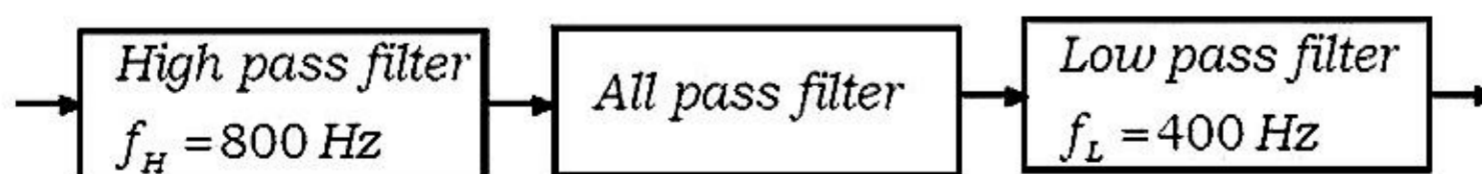
34058023275. ✘ Schmitt Trigger

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

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

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

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

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

**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.

34058023286. ✖ Vibrations into circuit through conduct

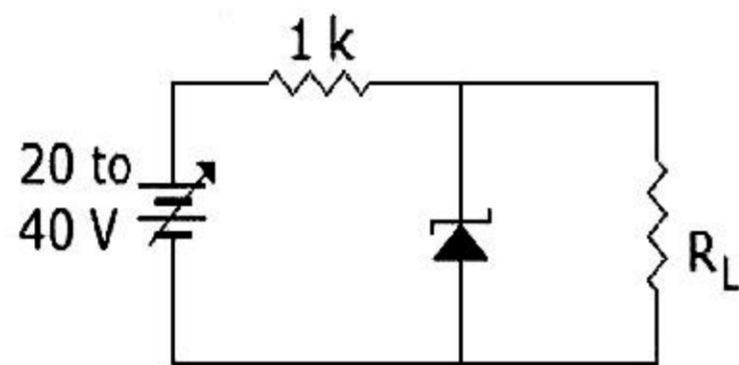
34058023287. ✔ Random emission of electrons across PN junction

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

: 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. ✖ $f_{1f} = 300 \text{ Hz}; f_{2f} = 2 \text{ MHz}$

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

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

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

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

Options :

34058023297. ✖ 0.658 V

34058023298. ✔ 0.398 V

34058023299. ✖ 0.7 V

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

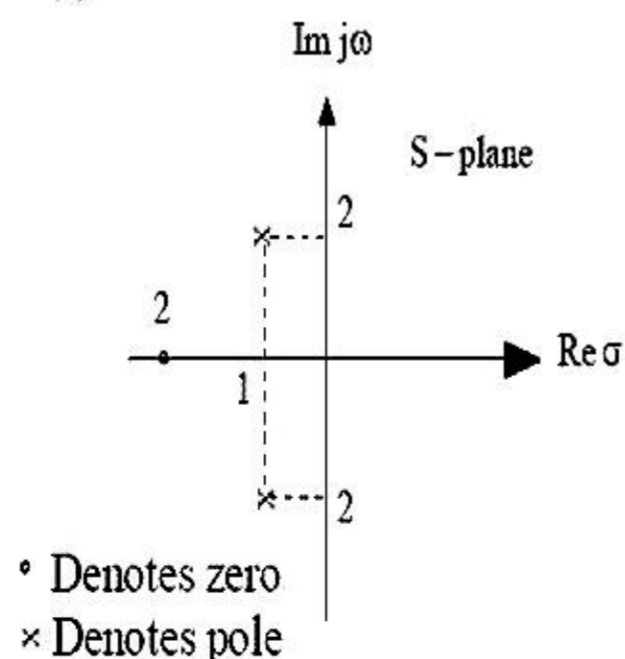
34058023303. ✖ Input impedance of second stage

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



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 200Ω and 50Ω . Then corresponding characteristic impedance is

Options :

34058023309. ✓ 100Ω

34058023310. ✘ 50Ω

34058023311. ✘ 10Ω

34058023312. ✘ 200Ω

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

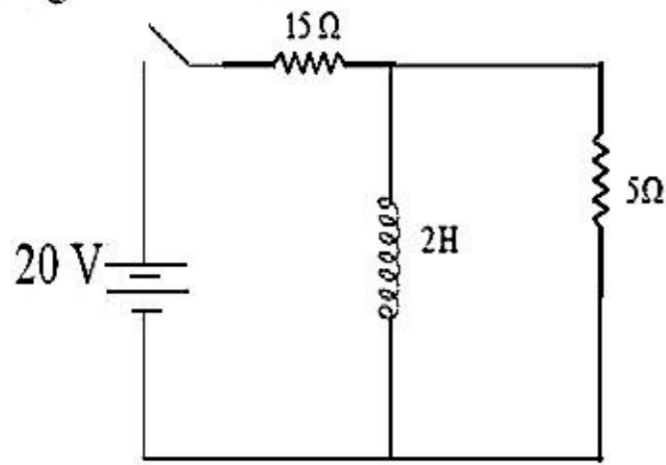
34058023314. ✔ $\begin{bmatrix} 16 & 5 \\ 5 & 26 \end{bmatrix}$

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

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



Options :

34058023317. ✖ 0 A

34058023318. ✔ 1 A

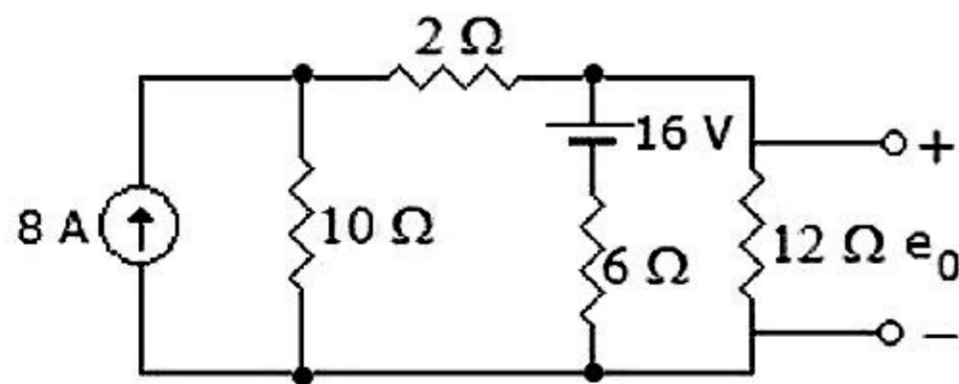
34058023319. ✖ 10 A

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

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 (ω_0) = 20 rad/sec. Then the bandwidth is

Options :

34058023325. ✔ 0.2 rad/sec

34058023326. ✖ 2 rad/sec

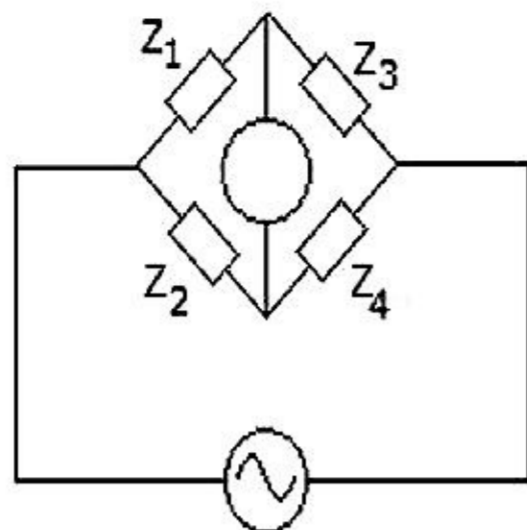
34058023327. ✖ 20 rad/sec

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

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. ✘ $Z_4 = 150 \angle 20^\circ$

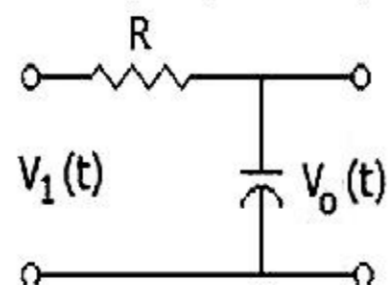
Question Number : 74 Question Id : 3405805834 Question Type : MCQ Option Shuffling : Yes

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 $RC = 1 \text{ ms}$, The input voltage is $V_1(t) = \sqrt{2} \sin 10^3 t$. The output voltage $V_o(t)$ is equal to



Options :

34058023333. ✔ $\sin (10^3 t - 45^\circ)$

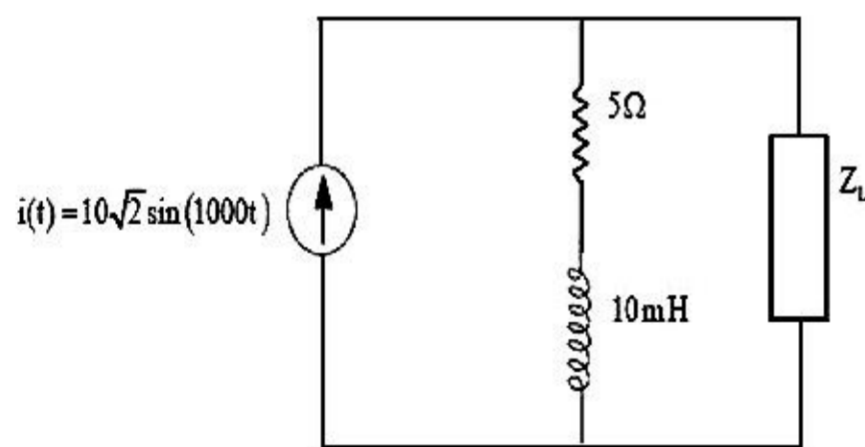
34058023334. ✖ $\sin(10^3 t + 45^\circ)$

34058023335. ✖ $\sin(10^3 t - 53^\circ)$

34058023336. ✖ $\sin(10^3 t + 53^\circ)$

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

: 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 $\frac{V_o(s)}{V_i(s)} = H(s) = \frac{10^6}{s^2 + 20s + 10^6}$; then the quality factor of the circuit is

Options :

34058023345. ✖ 25

34058023346. ✖ 100

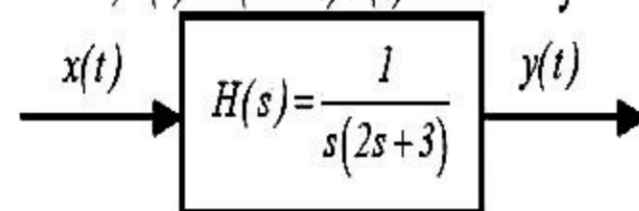
34058023347. ✔ 50

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. ✖ $y(t) = 4 \cos(t - 120^\circ)$

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

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

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

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

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

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

Options :

34058023361. ✖ It is lead network

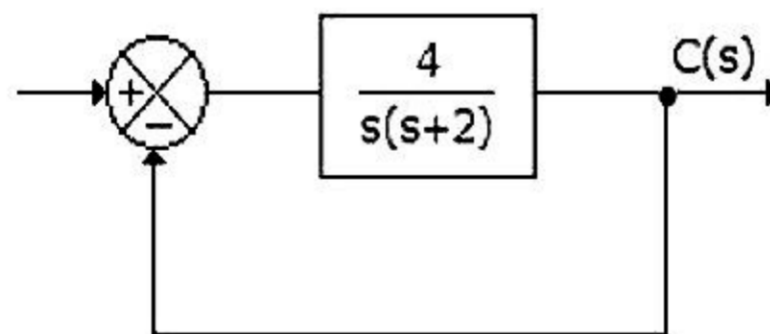
34058023362. ✖ It is lag network

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. ✖ $s = 0$ and $-1 \pm j\sqrt{3}$

34058023367. ✔ $s = -1 \pm j\sqrt{3}$

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

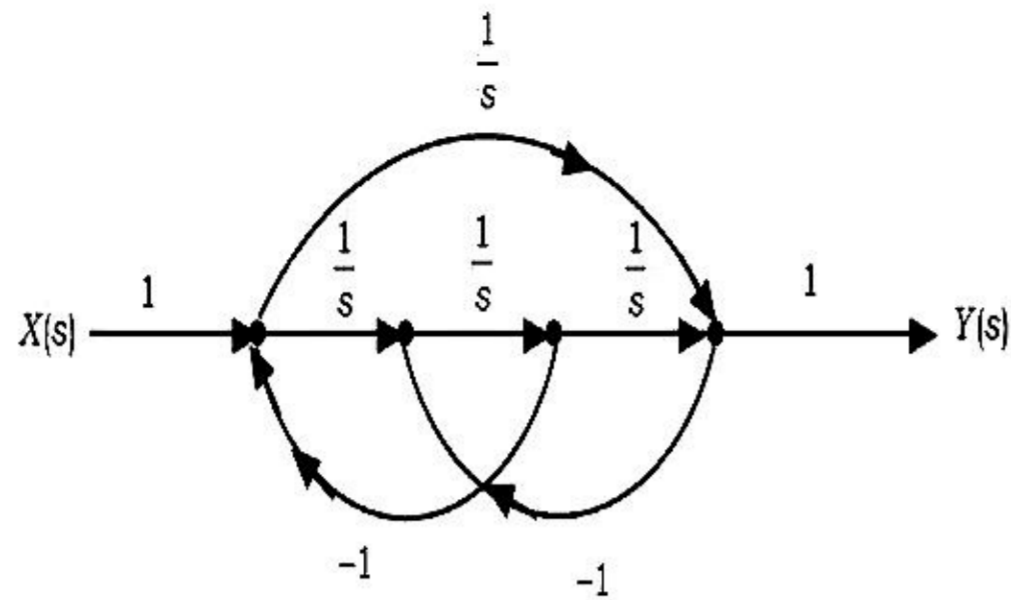
34058023370. ✖ $\left(e^{-\left(\frac{t}{T}\right)}\right)u(t)$

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

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

**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**

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

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

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 :

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

A unity feedback system has the following open loop frequency response

$\omega(\text{rad} / \text{sec})$

2

3

4

5

6

8

10

$|G(j\omega)|$

7.5

4.8

3.15

2.25

1.70

1.00

0.64

$\angle G(j\omega)$

-118°

-130°

-140°

-150°

-160°

-170°

-180°

The gain and phase margin of the system are

Options :

34058023385. ✖ $0 \text{ dB}, -180^\circ$

34058023386. ✖ $7 \text{ dB}, -170^\circ$

34058023387. ✔ $3.88 \text{ dB}, 10^\circ$

34058023388. ✖ $10 \text{ dB}, 20^\circ$

**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

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

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

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

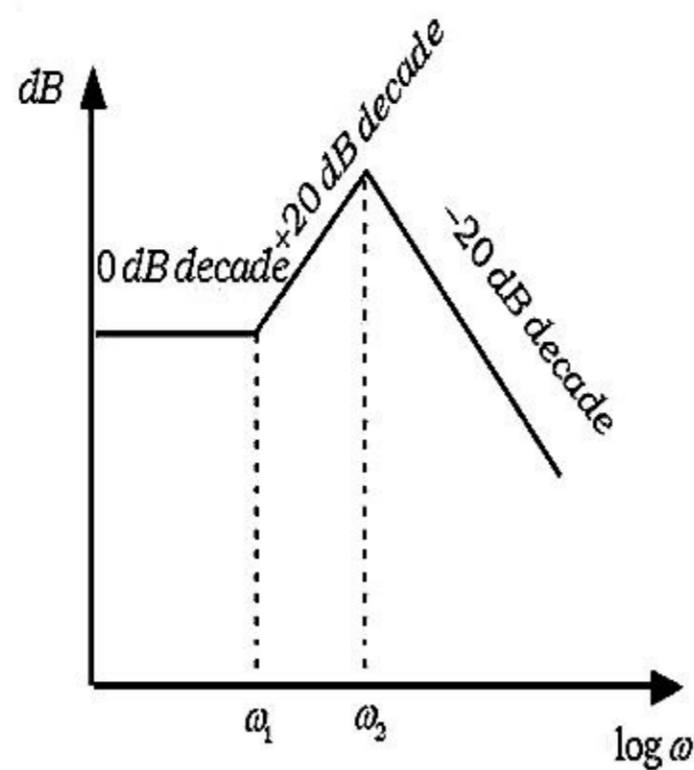
34058023391. ✖ 1

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

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 $\pm 0.5\%$ 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

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. ✖ $\frac{2}{\sqrt{2\pi}}V$

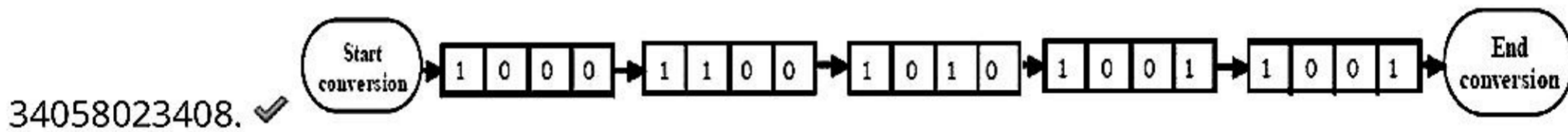
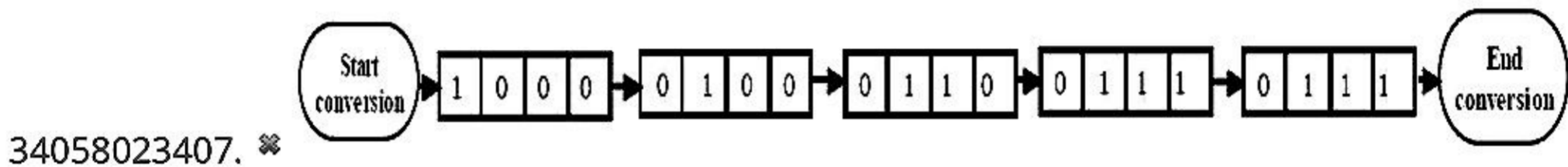
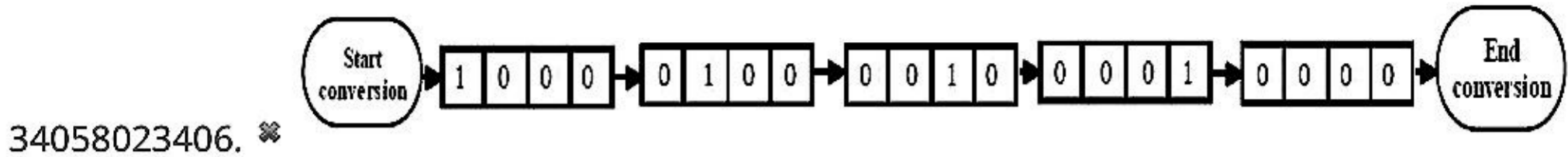
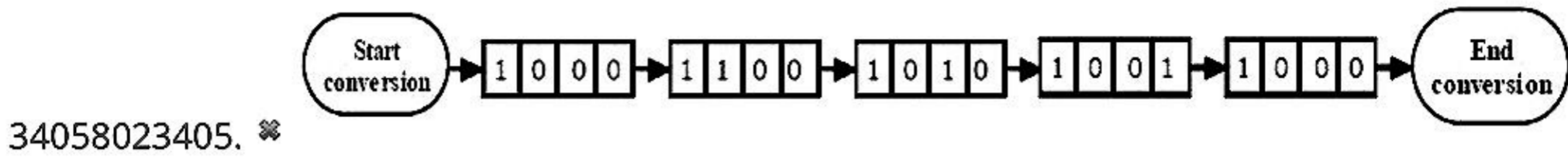
34058023404. ✖ $\frac{\sqrt{2}}{\pi}V$

**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

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 :



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 $0.5\ \Omega$ and a full scale deflection of 0.1 A . To convert it into an ammeter of $0-10\text{ A}$, the shunt resistance should be

Options :

34058023409. ✘ $0.004\ \Omega$

34058023410. ✔ $0.005\ \Omega$

34058023411. ✘ $0.05\ \Omega$

34058023412. ✖ 0.1Ω

**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 0.001Ω to 0.1Ω 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. ✔ $100 \mu\text{H}$

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 $1\text{M}\Omega$ 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

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. ✖ $2 \sin (\omega t + 45^\circ)$

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

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

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 125Ω strain gauge changes by 1 ohm for 4000 micro strain. The gauge factor is

Options :

34058023433. ✖ 1.5

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 :

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. ✖ $\frac{\sigma_2}{\sigma_2^2 + \sigma_1^2}$

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 steradians

34058023450. ✗ 0.30 steradians

34058023451. ✗ 0.32 steradians

34058023452. ✗ 0.34 steradians

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 $1.5\mu\text{m}$ between an optical flat and a surface, a light wave of wavelength $0.5\mu\text{m}$ produces fringes. The number of fringes is

Options :

34058023453. ✗ 3

34058023454. ✓ 6

34058023455. ✗ 9

34058023456. ✗ 12

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 $100\ \Omega$. The changes in resistance and elongation in the bar measured are $0.35\ \Omega$ 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

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 $\theta^\circ C$ with β denoting the volumetric expansion coefficient of mercury in $\theta^\circ C$, is

Options :

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

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**

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

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

$X(s)$ 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 field), 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

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 mm 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 $1\ \mu\text{m}$ 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 :

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 :

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 $100 \mu\text{V}$ 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

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