

Notations :

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

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Question Shuffling Allowed : Yes

Question Number : 1 Question Id : 2310981201 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The transfer function of a system where impulse response is e^{-3t} is:

Options :

1. ✖ $\frac{1}{s-3}$

2. ✓ $\frac{1}{s+3}$

3. ✖ S+3

4. ✖ S+3

Question Number : 2 Question Id : 2310981202 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0.66

A system with a unity gain margin and zero phase margin is _____.

Options :

1. ✖ relatively stable

2. ✖ highly stable

3. ✔ oscillatory

4. ✖ sluggish

Question Number : 3 Question Id : 2310981203 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0.66

The Laplace transform of a unit step function is:

Options :

1. ✔ $1/s$

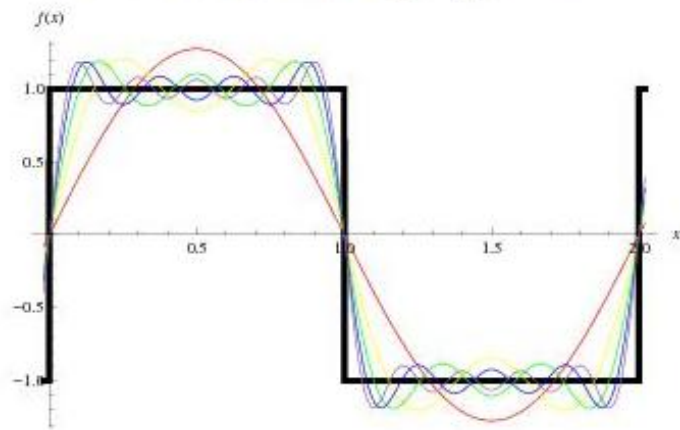
2. ✖ 1

3. ✖ s

4. ✖ $1/s^2$

Question Number : 4 Question Id : 2310981204 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0.66

Why prep.in the given image represent?



Options :

1. ✖ Aliasing
2. ✖ Shannon-Hartley Effect
3. ✔ Gibb's Phenomena
4. ✖ Wave Shaping

Question Number : 5 Question Id : 2310981205 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The transfer function of a tachometer is of the form:

Options :

1. ✔ Ks
2. ✖ K/s
3. ✖ $K/(s+1)$
4. ✖ $K/s(s+1)$

Question Number : 6 Question Id : 2310981206 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The function of lead and lag compensators have ___ and ___ phase angles, respectively, which makes the system ___ and ___, respectively.

Options :

1. ✗ -ve, +ve, faster, slower
2. ✗ -ve, -ve, slower, faster
3. ✓ +ve, -ve, faster, slower
4. ✗ +ve, +ve, slower, faster

Question Number : 7 Question Id : 2310981207 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

By the decomposition property of a linear system, we can separate two components of the linear system, namely:

Options :

1. ✗ steady state component and transient component
2. ✓ zero input component and zero state component
3. ✗ linear component and non-linear component
4. ✗ line and a circle

Question Number : 8 Question Id : 2310981208 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

If the loop gain is much greater than unity, the closed loop gain becomes approximately equal to:

Options :

1. ✗ feedback factor
2. ✗ square of the feedback factor

3. ✓ inverse of the feedback factor

4. ✗ twice of the feedback factor

Question Number : 9 Question Id : 2310981209 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

If $G(s) = \frac{5}{s}$ and $H(s) = \frac{1}{s}$ then this is:

Options :

1. ✗ type 0 system

2. ✓ type 1 system

3. ✗ type 2 system

4. ✗ type 3 system

Question Number : 10 Question Id : 2310981210 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

If a zero is added in a forward path of a second order system:

Options :

1. ✗ rise time will increase

2. ✗ bandwidth will decrease

3. ✓ rise time will decrease

4. ✗ system will be less stable

Question Number : 11 Question Id : 2310981211 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

The number of turns of wire needed to provide a potentiometer with a resolution of 0.057% is.

Options :

1. ✖ 200

2. ✔ 2000

3. ✖ 500

4. ✖ 5000

Question Number : 12 Question Id : 2310981212 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The Eigen values of $A = \begin{bmatrix} 0 & 1 \\ -6 & -5 \end{bmatrix}$ are:

Options :

1. ✖ Either 2 or 3

2. ✔ Either -2 or -3

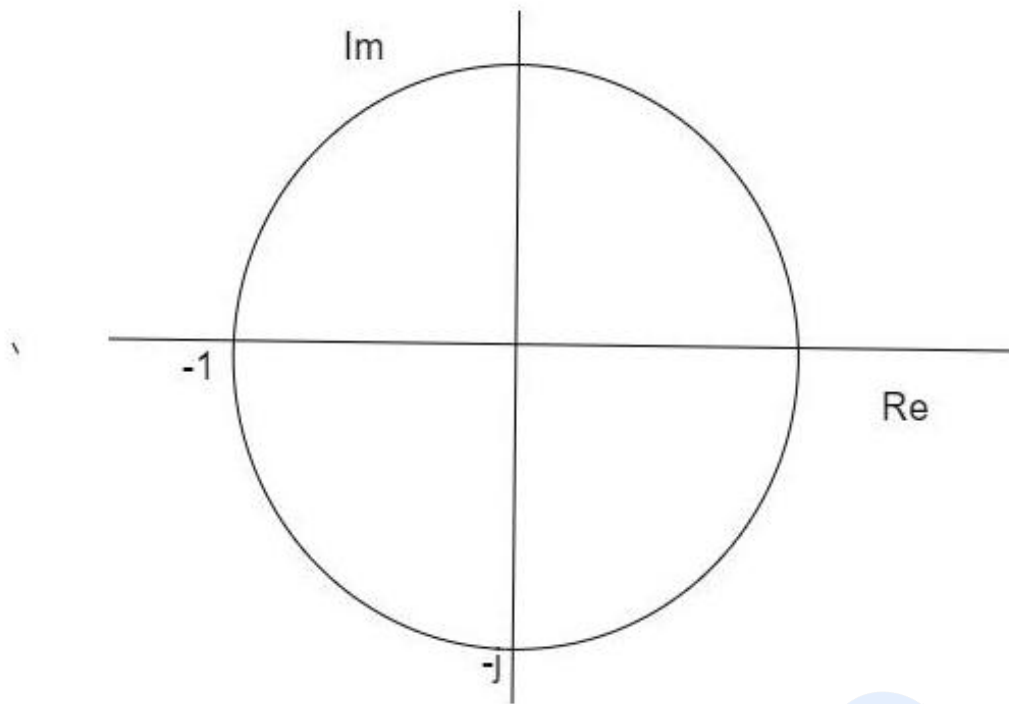
3. ✖ Either 2 or -3

4. ✖ Either -2 or 3

Question Number : 13 Question Id : 2310981213 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

WhyPrepp The Nyquist plot given below represents which circuit?



Options :

- 1. ✖ Low Pass Filter
- 2. ✖ High Pass Filter
- 3. ✖ Notch Filter
- 4. ✔ All Pass Filter

Question Number : 14 Question Id : 2310981214 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Steady state error for an open loop system is 0.1. Steady state error for the previously mentioned system being closed loop with a unity negative feedback and a pulse input for 1s having magnitude of 10 is ____.

Options :

- 1. ✖ 0.1
- 2. ✖ 0.2

3. ✖ 0

Question Number : 15 Question Id : 2310981215 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

If the output of the system at steady state doesn't agree with the input, then the system is said to have _____, which determines the _____ of the system.

Options :

1. ✖ residual error, overshoot

2. ✖ steady state error, tolerance

3. ✖ residual error, tolerance

4. ✔ steady state error, accuracy

Question Number : 16 Question Id : 2310981216 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The unit impulse response of a system is $h(t)=e^{-t}$, $t \geq 0$

For this system, the steady state value of the output for unit step input is equal to:

Options :

1. ✖ -1

2. ✔ 1

3. ✖ 0

4. ✖ infinity

Correct Marks : 2 Wrong Marks : 0.66

Consider a system with the transfer function $G(s) = (s+6)/(Ks^2+s+6)$. Its damping ratio will be 0.5 when the value of K is:

Options :

1. ✖ 2/6

2. ✖ 3

3. ✔ 1/6

4. ✖ 6

Question Number : 18 Question Id : 2310981218 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The sum $(9-j2) + (-7-j4)$ in the polar form is:

Options :

1. ✖ $2-j6$

2. ✔ $6.3\exp(-j71.6^\circ)$

3. ✖ $-j6.0$

4. ✖ $6.3\exp(j71.6^\circ)$

Question Number : 19 Question Id : 2310981219 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Let $x_1(t)$ and $x_2(t)$ be periodic with fundamental periods T_1 and T_2 , respectively. Under what condition be the sum $x(t) = x_1(t) + x_2(t)$ be periodic?

Options :

1. ✖ Only for $T_1 = T_2$

2. ✖ Always periodic

3. ✔ For T_1/T_2 equal to a rational number

4. ✖ Not periodic

Question Number : 20 Question Id : 2310981220 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

If the roots of the characteristic equation is $-2+j$, $-2-j$ then the system is:

Options :

1. ✔ stable

2. ✖ unstable

3. ✖ marginally stable

4. ✖ undeterminable

Question Number : 21 Question Id : 2310981221 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Fourier Transform of $\text{sgn}(t)$ is _____ (where sgn represents signum function).

Options :

1. ✖ $j\omega/2$

2. ✔ $2/j\omega$

3. ✖ $2j\omega$

Question Number : 22 Question Id : 2310981222 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Which modulation technique does NOT use past information for modulation?

Options :

1. ✖ Delta Modulation
2. ✖ Adaptive Delta Modulation
3. ✔ Pulse Code Modulation
4. ✖ Adaptive Differential Pulse Code Modulation

Question Number : 23 Question Id : 2310981223 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Number of bits per symbol in a 16 QAM is:

Options :

1. ✔ 4
2. ✖ 8
3. ✖ 16
4. ✖ 32

Question Number : 24 Question Id : 2310981224 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Which of the following has the least noise immunity?

Options :

1. ✓ ASK

2. ✗ PSK

3. ✗ FSK

4. ✗ QAM

Question Number : 25 Question Id : 2310981225 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Cross correlation function provides:

Options :

1. ✗ information about the structure of only one signal

2. ✗ measure of dissimilarities between two signals

3. ✓ measure of similarities between two signals

4. ✗ information about the behavior of only one signal in time domain

Question Number : 26 Question Id : 2310981226 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The Fourier series assists in finding the steady state response by transferring the analysis from the _____ to the _____.

Options :

1. ✓ time domain, frequency domain

2. ✗ frequency domain, time domain

3. ✖ Frequency domain, amplitude domain

4. ✖ amplitude domain, phase domain

Question Number : 27 Question Id : 2310981227 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The DFT of the sequence

$x = [1, 0, -1, 0]$ is:

Options :

1. ✖ $X = [0, 1, 0, 1]$

2. ✔ $X = [0, 2, 0, 2]$

3. ✖ $X = [1, 0, 1, 0]$

4. ✖ $X = [2, 0, 2, 0]$

Question Number : 28 Question Id : 2310981228 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Inverse Fourier Transform of $\delta(\omega - \omega_0)$ is:

Options :

1. ✖ $e^{j\omega_0 t}$

2. ✖ $2\pi e^{j\omega_0 t}$

3. ✖ $2\pi / e^{j\omega_0 t}$

4. ✔ $e^{j\omega_0 t / 2\pi}$

Correct Marks : 2 Wrong Marks : 0.66

The maximum efficiency of AM modulation (tone modulation) is:

Options :

1. ✖ 30%

2. ✔ 33%

3. ✖ 67%

4. ✖ 70%

Question Number : 30 Question Id : 2310981230 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The Fourier series expansion of $\text{sgn}(\cos(t))$ has _____ (where sgn represents the signum function).

Options :

1. ✖ only sine terms with odd harmonics

2. ✔ only cosine terms with odd harmonics

3. ✖ only sine terms with even harmonics

4. ✖ only cosine terms with even harmonics

Question Number : 31 Question Id : 2310981231 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

A system is given by $x(t) = e^{at} u(t)$. The system is _____.

Options :

1. ✖ causal and stable

3. ✗ non-causal and stable

4. ✗ non-causal and unstable

Question Number : 32 Question Id : 2310981232 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Let $x(t)$ be a signal with Nyquist rate w_0 . Determine the Nyquist rate for $y(t)=x(t)\cos(w_0t)$.

Options :

1. ✗ 2π 2. ✗ w_0 3. ✗ $2w_0$ 4. ✓ $3w_0$

Question Number : 33 Question Id : 2310981233 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

$$f(t) = -f(t-T/2)$$

The above periodic function possesses:

Options :

1. ✗ quarter wave symmetry

2. ✓ half wave symmetry

3. ✗ odd function symmetry

Question Number : 34 Question Id : 2310981234 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

If the discrete time sequence $x(n)$, $n \geq 0$ is defined to be $n(n)$, then the Z transform $X(z)$ is (for $|z| > 1$):

Options :

1. ✓ $\frac{z}{z-1}$

2. ✗ $\frac{z}{z+1}$

3. ✗ $\frac{1}{z-1}$

4. ✗ $\frac{1}{z+1}$

Question Number : 35 Question Id : 2310981235 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The 8-point DFT of the signal

$$x[n] = 6 \cos^2 \frac{\pi}{4} n \text{ is:}$$

Options :

1. ✗ $X[k] = [12, 0, 0, 0, 0, 0, 0, 12]$

2. ✓ $X[k] = [24, 0, 12, 0, 0, 0, 12, 0]$

3. ✗ $X[k] = [24, 0, 12, 0, 12, 0, 12, 0]$

4. ✗ $X[k] = [12, 0, 24, 0, 0, 0, 24, 0]$

Question Number : 36 Question Id : 2310981236 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

In a communication system, the signal power is 13 dBm and noise power is -1 dBm. The SNR will be:

Options :

1. ✓ 14 dB

2. ✗ -13 dB

3. ✗ 12 dBm

4. ✗ 12 dB

Question Number : 37 Question Id : 2310981237 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Channel capacity of a noise-free channel having M symbols is given by:

Options :

1. ✓ $\log M$

2. ✗ M

3. ✗ 2^M

4. ✗ M^2

Question Number : 38 Question Id : 2310981238 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

What is the total power carried by sidebands of the AM wave (DSB) for tone modulation for $\mu = 0.4$?

Options :

1. ✗ 11.11%

2. ✖ 4.3%

3. ✔ 7.4%

4. ✖ 8.3%

Question Number : 39 Question Id : 2310981239 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The modulation index of an AM modulated signal is 0.7 and the carrier power is 14 W. Calculate total sideband power.

Options :

1. ✖ 12.39 W

2. ✖ 23.14 W

3. ✖ 18.47 W

4. ✔ 17.43 W

Question Number : 40 Question Id : 2310981240 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

A periodic signal $F(t)$ has one of its period

$$F(t) = 2 \text{ for } 0 \leq t < 1$$

$$-1 \text{ for } 1 \leq t < 2$$

And a signal $g(t)$ is represented as, $g(t) = \sum_{k=-\infty}^{\infty} \delta(t - 2k)$ if, $\frac{df(t)}{dt} = (a1)(g(t - t1)) + (a2)(g(t - t2))$

What is the value of $a1$, $a2$, $t1$ and $t2$?

Options :

1. ✖ 1, 2, -1, -2

2. ✔ 3, -3, 0, 1

3. ✖ 3, 2, 1, 0

Question Number : 41 Question Id : 2310981241 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The impulse response of the discrete time filter is expressed by the z transform function

$$H(z) = \frac{1 - z^{-1}}{1 + 0.5z^{-1}}$$

The quotients of the impulse response values are:

Options :

1. ✖ $h(0) = 1, h(1) = 1.5, h(2) = 0.75, h(3) = 0.325$

2. ✔ $h(0) = 1, h(1) = -1.5, h(2) = 0.75, h(3) = -0.325$

3. ✖ $h(0) = 1, h(1) = 1.5, h(2) = -0.75, h(3) = -0.325$

4. ✖ $h(0) = 1, h(1) = -1.5, h(2) = -0.75, h(3) = -0.325$

Question Number : 42 Question Id : 2310981242 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

In PCM, the signal-to-quantisation noise ratio for a sinusoidal signal quantised using 10-bit PCM is:

Options :

1. ✔ 62 dB

2. ✖ 10 dB

3. ✖ 60 dB

Question Number : 43 Question Id : 2310981243 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

If the unit step response of the network is $(1 - e^{-at})$, then its impulse response is:

Options :

1. ✗ $a - 1 e^{-at}$

2. ✓ $a e^{-at}$

3. ✗ $(1 - a - 1) e^{-at}$

4. ✗ $(1 - a) e^{-at}$

Question Number : 44 Question Id : 2310981244 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

For what value of ω_0 , the discrete time signal $x[n] = e^{j\omega_0 n}$ is periodic signal with period N?

Options :

1. ✗ All values of ω_0

2. ✗ It is non-periodic

3. ✓ $\omega_0 = 2\pi(m/N)$, m is positive integer

4. ✗ $\omega_0 = 2\pi(m/N)$, m is a real number

Question Number : 45 Question Id : 2310981245 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The relationship between the electric field E and the current density J in a conducting medium (where σ is the conductivity) is:

Options :

1. ✓ $J = \sigma E$

3. ✗ $J = E/\sigma$

4. ✗ $J = \sigma^2 E$

Question Number : 46 Question Id : 2310981246 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The dominant mode of any waveguide is that of:

Options :

1. ✗ highest cut off frequency

2. ✓ lowest cut off frequency

3. ✗ magnetic properties

4. ✗ electrical properties

Question Number : 47 Question Id : 2310981247 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The capacitance per unit length and characteristic impedance of lossless transmission line are C and Z, respectively. The velocity of travelling wave on the transmission line is:

Options :

1. ✗ ZC

2. ✓ $1/ZC$

3. ✖ ZC

4. ✖ C/Z

Question Number : 48 Question Id : 2310981248 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Light is good for telecommunications because it is:

Options :

1. ✔ a high-frequency carrier

2. ✖ a low-frequency carrier

3. ✖ a very low-frequency carrier

4. ✖ a DC source

Question Number : 49 Question Id : 2310981249 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

If σ is the conductivity, what is the relationship between the electric field E and the current density J in a conducting medium?

Options :

1. ✖ $\sigma = E/J$

2. ✖ $\sigma = EJ$

3. ✖ $\sigma = 1/(EJ)$

4. ✔ $\sigma = J/E$

Question Number : 50 Question Id : 2310981250 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

The path of a light ray going from a high index material to a low index material is given by Snell's law. Which of the following is correct?

Options :

1. ✓ $n_1 \sin \alpha = n_2 \sin \beta$

2. ✗ $\frac{n_1}{\sin \alpha} = \frac{n_2}{\sin \beta}$

3. ✗ $n_1^2 \sin \alpha = n_2^2 \sin \beta$

4. ✗ $\frac{\sin \alpha}{n_1} = \frac{\sin \beta}{n_2}$

Question Number : 51 Question Id : 2310981251 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3 Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The wave impedance of a medium is equal to:

Options :

1. ✗ the wave impedance of free-space

2. ✓ the wave impedance of free-space divided by the refractive index of the medium

3. ✗ the refractive index of the medium divided by the wave impedance of free-space

4. ✗ the refractive index of the medium

Question Number : 52 Question Id : 2310981252 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3 Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Consider an interface between two dielectric materials, one with $\epsilon_r = 2$ while the other has $\epsilon_r = 5$. If the tangential component of electric field on one side of the interface has a magnitude of 10 V.m^{-1} what is the magnitude of the tangential component of electric field on the other side?

Options :

1. ✓ 10 V.m^{-1}

2. ✗ 2 V.m^{-1}

3. ✗ 20 V.m^{-1}

4. ✗ 5 V.m^{-1}

Question Number : 53 Question Id : 2310981253 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Vector Potential is a vector:

Options :

1. ✓ whose curl is equal to the magnetic flux density

2. ✗ whose curl is equal to electric field intensity

3. ✗ whose divergence is equal to electric potential

4. ✗ which is equal to vector product $\mathbf{E} \times \mathbf{H}$

Question Number : 54 Question Id : 2310981254 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

A transmission line is distortion less if:

Options :

1. ✗ $RL=1/GC$

2. ✗ $RL=GC$

3. ✓ $LG=RC$

Question Number : 55 Question Id : 2310981255 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The beam width between first nulls of an uniform linear array of N equally spaced (element spacing= d), equally excited antenna is determined by:

Options :

1. ✖ N alone

2. ✖ d alone

3. ✖ the ratio N/d

4. ✔ the product Nd

Question Number : 56 Question Id : 2310981256 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

An antenna, when radiating, has highly directional radiation pattern. When antenna is receiving, its radiation pattern:

Options :

1. ✖ is more directive

2. ✖ is less directive

3. ✔ is the same

4. ✖ exhibits no directivity at all

Question Number : 57 Question Id : 2310981257 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The frequency range of satellite communication is:

Options :

1. ✖ 1 KHz to 100 KHz

2. ✖ 100 KHz to 10 MHz

3. ✖ 10 MHz to 30 MHz

4. ✔ 1 GHz to 30 GHz

Question Number : 58 Question Id : 2310981258 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

A medium wave radio transmitter operating at a wavelength of 496 meters has a tower antenna height of 124 meters.
What is the radiation resistance of the antenna?

Options :

1. ✖ 25 Ω

2. ✔ 36.5 Ω

3. ✖ 73 Ω

4. ✖ 50 Ω

Question Number : 59 Question Id : 2310981259 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Two lossy lines are to be joined end to end. The first line is 10 m long and has a loss rating of 0.20 dB/m. The second line is 15 m long and has a loss rating of 0.10 dB/m. The reflection coefficient at the junction (line 1 to line 2) is $\Gamma = 0.30$. The input power (to line 1) is 100 mW. Determine the total loss of the combination in dB to the output end of line 2.

Options :

1. ✔ 3.91 dB

2. ✖ 2.91 dB

3. ✖ 4.91 dB

4. ✖ 1.91 dB

Question Number : 60 Question Id : 2310981260 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The skin depth of copper at a frequency of 3 GHz is 1 micron. At 12 GHz for a non-magnetic conductor whose conductivity is 1/3 times of copper, the skin depth in microns would be:

Options :

1. ✖ $\sqrt{9 * 4}$

2. ✔ $\sqrt{3/4}$

3. ✖ $\sqrt{4/9}$

4. ✖ $1/\sqrt{9 * 4}$

Question Number : 61 Question Id : 2310981261 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The wavelength of a wave propagation constant $(0.1 \pi + j0.4 \pi) \text{ m}^{-1}$ is:

Options :

1. ✔ 5 m

2. ✖ 10 m

3. ✖ 20 m

Question Number : 62 Question Id : 2310981262 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

A uniform plane wave in air impinges at 45° angle on lossless dielectric material with dielectric constant ϵ_r . The transmitted wave propagates in 30° direction with respect to the normal. The value of ϵ_r is:

Options :

1. ✖ 1.5

2. ✔ 2

3. ✖ $\sqrt{2}$

4. ✖ 3

Question Number : 63 Question Id : 2310981263 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Given a ferrite material that we shall specify to be operating in a linear mode with $B = 0.05$ T, let us assume $\mu_r = 50$, and calculate the approximate value for magnetisation M .

Options :

1. ✖ 41350 A/m

2. ✔ 39000 A/m

3. ✖ 34500 A/m

4. ✖ 40500 A/m

Question Number : 64 Question Id : 2310981264 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Find the maximum torque on an 85 turn, rectangular coil, 0.2m by 0.3m, carrying a current of 2.0A in a field $B=6.5$ T.

1. ✖ 13 N.m.

2. ✔ 66.3 N.m.

3. ✖ 33.15 N.m.

4. ✖ 170 N.m.

Question Number : 65 Question Id : 2310981265 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Let $G = 3xy^2ax + 2zay$. Given an initial point P (2, 1, 1) and a final point Q (4, 3, 1), find $\int G \cdot dL$ using the straight line: $y = x - 1, z = 1$.

Options :

1. ✔ 90

2. ✖ 60

3. ✖ -90

4. ✖ -60

Question Number : 66 Question Id : 2310981266 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

A lossless transmission line is 80 cm long and operates at a frequency of 600 MHz. The line parameters are $L = 0.25 \mu\text{H/m}$ and $C = 100 \text{ pF/m}$. Find the phase constant and phase velocity of the transmission line.

Options :

1. ✔ 18.85 rad/m and $2.00 \times 10^8 \text{ m/s}$

2. ✖ 15.50 rad/m and $2.43 \times 10^8 \text{ m/s}$

3. ✖ 18.85 rad/m and $2.43 \times 10^8 \text{ m/s}$

4. ✖ 15.50 rad/m and $2.00 \times 10^8 \text{ m/s}$

Question Number : 67 Question Id : 2310981267 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

A signal $f(t)$ is said to be an even signal if:

Options :

1. ✔ $f(-t)=f(t)$

2. ✖ $f(-t)=-f(t)$

3. ✖ $f(-t)=f(t) \times f(t)$

4. ✖ $f(-t)=f(t)/2$

Question Number : 68 Question Id : 2310981268 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

A signal is said to be periodic if:

Options :

1. ✖ $f(t) = f(nT)$

2. ✔ $f(t) = f(t \pm nT)$

3. ✖ $f(t) = f(t) \times f(t)$

4. ✖ $f(t) = f(t) \times f(-t)$

Question Number : 69 Question Id : 2310981269 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

When we integrate a unit step function with respect to time from 0 to infinity, we get

Options :

1. ✗ unit impulse function
2. ✗ unit step function
3. ✓ unit ramp function
4. ✗ unit gate function

Question Number : 70 Question Id : 2310981270 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

In a linear circuit, when the ac input is halved, the ac output:

Options :

1. ✗ becomes double
2. ✗ remains the same
3. ✓ becomes half
4. ✗ becomes thrice

Question Number : 71 Question Id : 2310981271 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Which of the following signals is odd?

Options :

1. ✗ $y(t) = t ; 0 \leq t \leq \pm\infty$
2. ✓ $y(t) = \sin (100\pi t)$

4. ✖ $y(t) = \cos(200\pi t)$

Question Number : 72 Question Id : 2310981272 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Which of the following is NOT a dependent electrical energy source?

Options :

1. ✔ Voltage source

2. ✖ Voltage controlled voltage source (VCVS)

3. ✖ Voltage controlled current source (VCCS)

4. ✖ Current controlled voltage source (CCVS)

Question Number : 73 Question Id : 2310981273 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

What is the characteristic of an ideal voltage source?

Options :

1. ✔ It has zero series resistance

2. ✖ It has infinite series resistance

3. ✖ It has zero output resistance

4. ✖ It has infinite output resistance

Question Number : 74 Question Id : 2310981274 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

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R_A and R_B give a combined resistance of $2\ \Omega$ when they are connected in parallel and $9\ \Omega$ when connected in series. Then the values of the resistances are:

Options :

1. ✖ $4\ \Omega$ and $5\ \Omega$

2. ✔ $3\ \Omega$ and $6\ \Omega$

3. ✖ $3\ \Omega$ and $4\ \Omega$

4. ✖ $6\ \Omega$ and $9\ \Omega$

Question Number : 75 Question Id : 2310981275 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The energy expended in a resistor R (in joules) when a current of I flows through it for t seconds is:

Options :

1. ✔ $I^2 R t$

2. ✖ $I R t$

3. ✖ $I^4 R t$

4. ✖ $I R^3 t$

Question Number : 76 Question Id : 2310981276 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

A $4\ \Omega$ resistance having a current of $1\ \text{A}$ flowing through it will have a dissipated power of:

Options :

1. ✖ $12\ \text{W}$

2. ✔ $4\ \text{W}$

3. ✖ 8 W

4. ✖ 16 W

Question Number : 77 Question Id : 2310981277 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

An ideal voltage source will charge an ideal capacitor:

Options :

1. ✖ in infinite time

2. ✔ instantaneously

3. ✖ exponentially

4. ✖ in 100 milliseconds

Question Number : 78 Question Id : 2310981278 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The internal impedance of an electric circuit is $3+j4\Omega$. For maximum power transfer, what should be the load impedance?

Options :

1. ✖ $5+j5\Omega$

2. ✔ $3-j4\Omega$

3. ✖ $3+j4\Omega$

4. ✖ $5-j5\Omega$

Correct Marks : 2 Wrong Marks : 0.66

In an electric circuit, the series impedance consists of a $3\ \Omega$ resistance in series with an inductive reactance of $j4\ \Omega$. If the circuit is energised by an AC voltage source of $50 \sin 100\pi t$, find the current in the circuit.

Options :

1. ✓ $10 \sin (100\pi t - \tan^{-1}(4/3))$

2. ✗ $10 \sin (100\pi t + \tan^{-1}(4/3))$

3. ✗ $25 \sin (100\pi t - \tan^{-1}(4/3))$

4. ✗ $25 \sin (100\pi t + \tan^{-1}(4/3))$

Question Number : 80 Question Id : 2310981280 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

A two-port network is defined by the relations $I_1 = 2V_1 + V_2$ and $I_2 = 2V_1 + 3V_2$. Then Z_{12} is:

Options :

1. ✗ $-2.0\ \Omega$

2. ✗ $1.0\ \Omega$

3. ✗ $+0.25\ \Omega$

4. ✓ $-0.25\ \Omega$

Question Number : 81 Question Id : 2310981281 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The Fourier transform of the unit impulse function $\delta(t)$ will be:

Options :

1. ✗ 0.2

2. ✖ 0.4

3. ✔ 1.0

4. ✖ 2.0

Question Number : 82 Question Id : 2310981282 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

What is the Fourier transform of the convolved (in time domain) results of two functions whose individual Fourier transforms are $X(f)$ and $Y(f)$?

Options :

1. ✖ $X(f)/Y(f)$ 2. ✖ $X(f)/Y(f)^2$ 3. ✔ $X(f) \times Y(f)$ 4. ✖ $Y(f)/X(f)$

Question Number : 83 Question Id : 2310981283 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The Z-transform of the function unit impulse function $\delta[n]$ is:

Options :

1. ✖ ∞

2. ✖ 0

3. ✖ 2

Question Number : 84 Question Id : 2310981284 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Out of the following Linear Shift Invariant (LSI) systems, which one is non-causal?

Options :

1. ✖ $h[n] = u[n-4]$

2. ✖ $h[n] = u[n+4]$

3. ✔ $h[n] = \delta[n+3]$

4. ✖ $H[n] = u[n] - u[n-1]$

Question Number : 85 Question Id : 2310981285 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The unit impulse response of a Linear Time-Invariant (LTI) system is $\delta(t)$. What will be the response of the system for a unit ramp input $r(t)$?

Options :

1. ✖ $u(t)$

2. ✖ $\delta(t)$

3. ✖ $u(t) * \delta(t)$

4. ✔ $r(t)$

Question Number : 86 Question Id : 2310981286 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

For a Linear Time-Invariant (LTI) system, the commutative property depicts that:

Options :

1. ✓ $x(t) \cdot y(t) = y(t) \cdot x(t)$

2. ✗ $x(t) \cdot y(t) = x(t) \times y(t)$

3. ✗ $x(t) \times y(t) = x(t)/y(t)$

4. ✗ $x(t)/y(t) = y(t)/x(t)$

Question Number : 87 Question Id : 2310981287 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The poles of the transfer function $T(s) = s(s+1)/\{(s^2+4s+4)\}$ are located at:

Options :

1. ✗ $s = 0$ and $s = -1$.

2. ✗ $s = 2$ and $s = -2$.

3. ✓ $s = -2$ and $s = -2$.

4. ✗ $s = 0$ and $s = -2$.

Question Number : 88 Question Id : 2310981288 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Out of the following materials, which one will have maximum Forbidden Band Gap?

Options :

1. ✗ Aluminium (Al)

2. ✗ Silicon (Si)

3. ✖ Germanium (Ge)

4. ✔ Silica (SiO₂)

Question Number : 89 Question Id : 2310981289 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The current flowing in a semiconductor due to the application of an external DC voltage is called:

Options :

1. ✔ drift current

2. ✖ diffusion current

3. ✖ intrinsic current

4. ✖ extrinsic current

Question Number : 90 Question Id : 2310981290 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

A cylindrically-shaped section of n-type silicon has 2 mm length and 0.2 mm² cross-sectional area. Calculate its resistivity when it is purely intrinsic material.

Options :

1. ✖ 3,08,333.333 Ω.cm

2. ✖ 4,08,333.333 Ω.cm

3. ✔ 2,08,333.333 Ω.cm

4. ✖ 6,48,333.333 Ω.cm

Correct Marks : 2 Wrong Marks : 0.66

The voltage required to forward bias a P-N junction-based on silicon is:

Options :

1. ✖ 0.15 V

2. ✖ 0.32 V

3. ✖ 0.55 V

4. ✔ 0.70 V

Question Number : 92 Question Id : 2310981292 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Calculate the maximum current that can be passed through a 1N755 Zener Diode at a temperature of 50°C. For a 1N755 Zener Diode, $V_Z = 7.5$ V and $P_D = 400$ mW at 50°C.

Options :

1. ✔ 53.33 mA

2. ✖ 63.33 mA

3. ✖ 73.33 mA

4. ✖ 93.33 mA

Question Number : 93 Question Id : 2310981293 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The MOS capacitors are widely used as _____ RAM.

Options :

1. ✖ static

2. ✓ dynamic

3. ✗ floating

4. ✗ disk

Question Number : 94 Question Id : 2310981294 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

In a Common Gate MOSFET amplifier, the phase shift between input and output voltages is:

Options :

1. ✗ 180°

2. ✗ 240°

3. ✓ 0°

4. ✗ 300°

Question Number : 95 Question Id : 2310981295 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The typical forward bias voltage of an LED is:

Options :

1. ✓ 1.6 V

2. ✗ 3.3 V

3. ✗ 0.82 V

Question Number : 96 Question Id : 2310981296 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

For a maximum output power, the solar cell must be operated at:

Options :

1. ✖ short circuited condition $I_o=0$.
2. ✖ open-circuited condition $V_o=0$.
3. ✔ the knee of the V-I characteristics.
4. ✖ the peak load of V-I Characteristics.

Question Number : 97 Question Id : 2310981297 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

An illuminated photo-diode without an external bias operates as a _____ device.

Options :

1. ✔ photovoltaic
2. ✖ phototransistor
3. ✖ photoresistor
4. ✖ photomultiplier

Question Number : 98 Question Id : 2310981298 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The main purpose of oxidation in the IC fabrication process using silicon is:

Options :

1. ✖ diffusion
2. ✖ epitaxial growth
3. ✔ passivation
4. ✖ packaging

Question Number : 99 Question Id : 2310981299 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The diffusion process in an IC fabrication is done by:

Options :

1. ✔ heating the wafers in an atmosphere of impurities
2. ✖ cooling the wafers inside an ingot
3. ✖ epitaxial growth
4. ✖ anodisation

Question Number : 100 Question Id : 2310981300 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The epitaxial growth allows the wafers to be _____ by the diffusion process.

Options :

1. ✖ passivated
2. ✖ oxidised

3. ✓ ☒ **opened**

4. ✗ ☐ **neutralised**

Question Number : 101 Question Id : 2310981301 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Within Fresnel diffraction range, the minimum resolvable feature size is of the order of _____ when a proximity exposure system is operating with a 10 μm gap and a light source with a wavelength of $\lambda = 365 \text{ nm}$.

Options :

1. ✓ ☒ **1.91 μm**

2. ✗ ☐ **2.94 μm**

3. ✗ ☐ **2.56 μm**

4. ✗ ☐ **3.65 μm**

Question Number : 102 Question Id : 2310981302 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The twin-well technology is usually used to fabricate:

Options :

1. ✗ ☐ **PMOS devices**

2. ✗ ☐ **NMOS devices**

3. ✓ ☒ **CMOS devices**

4. ✗ ☐ **I²L devices**

Question Number : 103 Question Id : 2310981303 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

One CMOS capacitance can store _____ bit(s) of digital information.

Options :

1. ✖ 4

2. ✖ 3

3. ✖ 2

4. ✔ 1

Question Number : 104 Question Id : 2310981304 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

In a direct-coupled FET switching circuit, $R_G = 2.2 \text{ k}\Omega$ and $V_{DS(on)} = 200 \text{ mV}$. If a 2N4856 FET is used with a 12 V supply, calculate the value of R_D (for 2N4856, $r_{DS(on)} = 25 \text{ }\Omega$).

Options :

1. ✖ 3.5 k Ω

2. ✖ 2.5 k Ω

3. ✖ 5.5 k Ω

4. ✔ 1.5 k Ω

Question Number : 105 Question Id : 2310981305 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

An OPAMP-based comparator drives an LED, with $V_F = 1.6 \text{ V}$, the current through which is regulated by a 1 k Ω resistor and a silicon diode in series. Assume a $\pm 10 \text{ V}$ DC voltage is applied as $\pm V_{CC}$ respectively to the OPAMP. Then find out the current through the LED when the comparator output is +10 V.

Options :

1. ✖ 5.4 mA

2. ✖ 8.9 mA

3. ✔ 7.7 mA

4. ✖ 6.7 mA

Question Number : 106 Question Id : 2310981306 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

When used as a photodetector, a photodiode should be:

Options :

1. ✖ open-circuited

2. ✖ short-circuited

3. ✖ forward biased

4. ✔ reverse biased

Question Number : 107 Question Id : 2310981307 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The efficiency of energy conversion of a solar cell _____ with an increase in the ambient temperature.

Options :

1. ✔ decreases

2. ✖ remains the same

3. ✖ increases

4. ✖ Decreases first and then increases

Question Number : 108 Question Id : 2310981308 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

At room temperature the concentrations of H^+ and OH^- ions in equilibrium are: $[H^+] = [OH^-] \approx 6 \times 10^{-13} \text{ cm}^{-3}$ in water.
The diffusivity D of H^+ ions is $9.3 \times 10^{-9} \text{ m}^2 \text{ sec}^{-1}$. Calculate the mobility μ of H^+ ions.

Options :

1. ✖ $6.546 \times 10^{-3} \text{ cm}^2 \text{ V}^{-1} \text{ sec}^{-1}$

2. ✔ $3.596 \times 10^{-3} \text{ cm}^2 \text{ V}^{-1} \text{ sec}^{-1}$

3. ✖ $4.598 \times 10^{-3} \text{ cm}^2 \text{ V}^{-1} \text{ sec}^{-1}$

4. ✖ $5.586 \times 10^{-3} \text{ cm}^2 \text{ V}^{-1} \text{ sec}^{-1}$

Question Number : 109 Question Id : 2310981309 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

In a semiconductor, the holes exist in the _____ band.

Options :

1. ✖ conduction

2. ✔ valence

3. ✖ forbidden

4. ✖ fermi

Question Number : 110 Question Id : 2310981310 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The equivalent DC output voltage of a full-wave rectifier is _____ the equivalent DC output voltage of a half-wave rectifier.

Options :

1. ✖ equal to
2. ✖ not related to
3. ✖ half of
4. ✔ double

Question Number : 111 Question Id : 2310981311 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

In a common-emitter configuration, for the maximum output voltage swing, the collector of the BJT should be biased at:

Options :

1. ✖ $0.25 V_{CC}$
2. ✖ $0.35 V_{CC}$
3. ✖ $0.45 V_{CC}$
4. ✔ $0.5 V_{CC}$

Question Number : 112 Question Id : 2310981312 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

When a capacitor is connected across the output terminals of a full-wave rectifier, the output voltage:

Options :

1. ✔ nearly becomes a DC voltage.
2. ✖ becomes sinusoidal.
3. ✖ exhibits sharp spikes.

Question Number : 113 Question Id : 2310981313 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

With a capacitor connected across the output, the ripple voltage in a half-wave rectifier is _____ the ripple voltage in a full-wave rectifier.

Options :

1. ✔ more than

2. ✖ less than

3. ✖ equal to

4. ✖ nearly half

Question Number : 114 Question Id : 2310981314 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Diodes are used to clip voltages in circuits because they act as:

Options :

1. ✖ current sources under certain bias conditions.

2. ✔ voltage sources under certain bias conditions.

3. ✖ inductors that can remove spikes.

4. ✖ dependent current sources.

Question Number : 115 Question Id : 2310981315 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

A half-wave rectifier made with a single diode and a load resistor converts an AC voltage into:

Options :

1. ✖ a constant DC voltage.

2. ✖ a sinusoidal voltage that has a DC offset.

3. ✔ a waveform that has only the positive or negative half-cycle of the input sinusoid.

4. ✖ Another AC voltage that is phase shifted by 180° .

Question Number : 116 Question Id : 2310981316 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

A reverse-biased diode placed in series with the emitter of the transistor makes the circuit insensitive to variations in _____ with changes in the temperature.

Options :

1. ✔ V_{BE}

2. ✖ I_{CO}

3. ✖ β

4. ✖ α

Question Number : 117 Question Id : 2310981317 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

In typical circuits, the stabilisation factor $S = \Delta I_C / \Delta I_{CO}$ is:

Options :

1. ✖ <1

2. ✔ >1

3. ✖ $\ll 1$

Question Number : 118 Question Id : 2310981318 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

A reverse-biased diode placed in parallel with the base-emitter junction makes the circuit insensitive to variations in _____ with changes in temperature.

Options :

1. ✖ V_{BE}

2. ✔ I_{CO}

3. ✖ β

4. ✖ α

Question Number : 119 Question Id : 2310981319 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

A BJT has $C_e = 1 \text{ pF}$. If g_m is 50 mA/V , calculate the f_T of a common-emitter amplifier.

Options :

1. ✖ 20 MHz

2. ✖ 80 MHz

3. ✔ 8 GHz

4. ✖ 2 GHz

Question Number : 120 Question Id : 2310981320 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

A silicon NPN transistor has a base width of 500Å . The electron diffusivity in the base is $25\text{ cm}^2/\text{sec}$. The f_T of the transistor is:

Options :

1. ✖ 100.24 GHz

2. ✔ 318.31 GHz

3. ✖ 524.12 GHz

4. ✖ 220.56 GHz

Question Number : 121 Question Id : 2310981321 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3 Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Of all the logic families, the CMOS has become the most preferred for VLSI and ULSI because:

Options :

1. ✖ it is the fastest.

2. ✖ it is most immune to noise.

3. ✖ its design is the easiest.

4. ✔ it consumes no static power.

Question Number : 122 Question Id : 2310981322 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3 Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

For an ideal OPAMP, the output resistance R_o is:

Options :

1. ✔ 0

2. ✖ 1

3. ✖ ∞

4. ✖ $1\text{ M}\Omega$

Question Number : 123 Question Id : 2310981323 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

When an OPAMP is used as an inverting amplifier with $R_f = 100\text{ k}\Omega$ and $R_i = 10\text{ k}\Omega$, the closed-loop gain is:

Options :

1. ✖ 10.00

2. ✔ -10.00

3. ✖ -11.00

4. ✖ 11.00

Question Number : 124 Question Id : 2310981324 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

When an OPAMP is used as a non-inverting amplifier with $R_f = 100\text{ k}\Omega$ and $R_i = 10\text{ k}\Omega$, the closed-loop gain is:

Options :

1. ✖ 10.00

2. ✖ -10.00

3. ✖ -11.00

4. ✔ 11.00

Question Number : 125 Question Id : 2310981325 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

In an RC phase shift oscillator using FET, for sustained oscillations, the minimum voltage gain of the FET should be:

Options :

1. ✓ 29

2. ✗ 64

3. ✗ 41

4. ✗ 56

Question Number : 126 Question Id : 2310981326 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The transfer function $T(s)$ of a single OPAMP inverting mode filter that has a capacitance C and resistance R in the feedback path and an input resistance R is:

Options :

1. ✓ $-1/\{1+sRC\}$

2. ✗ $1+sRC$

3. ✗ $-sRC/\{1+sRC\}$

4. ✗ $sRC/\{1+sRC\}$

Question Number : 127 Question Id : 2310981327 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

In a typical 555 astable multivibrator circuit, if $R_A=R_B=2.2k\Omega$ and $C=0.1\mu F$, then the free-running frequency is:

Options :

1. ✗ 3.123 KHz

2. ✓ 2.186 KHz

3. ✗ 4.128 KHz

4. ✗ 6.226 KHz

Question Number : 128 Question Id : 2310981328 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

In a regulated power supply, a pass transistor is used at the output of the OPAMP to:

Options :

1. ✗ provide a higher gain in the feedback loop.

2. ✗ provide a high input impedance to the OPAMP.

3. ✓ provide a larger current drive to the load.

4. ✗ allow input voltage to pass efficiently to the output.

Question Number : 129 Question Id : 2310981329 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

In a DC voltage regulator using LM117 IC, if the feedback resistance connected across V_{OUT} and ADJ terminals R_1 is $240\ \Omega$ and the resistance connected between ADJ and ground R_2 is $4.7\ k\Omega$, then the regulated output voltage is:

Options :

1. ✓ 25.73 V

2. ✗ 30.15 V

3. ✗ 42.15 V

Question Number : 130 Question Id : 2310981330 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

When expressed in the binary system, 1.75_{10} is:

Options :

1. ✓ 1.11_2

2. ✗ 1.01_2

3. ✗ 1.001_2

4. ✗ 1.101_2

Question Number : 131 Question Id : 2310981331 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

When expressed in the octal number system, 110111101.11_2 is:

Options :

1. ✗ 685.6_8

2. ✓ 675.6_8

3. ✗ 775.6_8

4. ✗ 695.6_8

Question Number : 132 Question Id : 2310981332 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

How many inputs and outputs does a half-subtractor have?

Options :

1. ✓ 2 inputs and 2 outputs
2. ✗ 3 inputs and 2 outputs
3. ✗ 2 inputs and 3 outputs
4. ✗ 3 inputs and 3 outputs

Question Number : 133 Question Id : 2310981333 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

How many inputs and outputs does a 1-bit magnitude comparator have?

Options :

1. ✗ 2 inputs and 2 outputs
2. ✗ 3 inputs and 2 outputs
3. ✓ 2 inputs and 3 outputs
4. ✗ 3 inputs and 3 outputs

Question Number : 134 Question Id : 2310981334 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

Which logic gate is a basic comparator?

Options :

1. ✗ NOR
2. ✗ NAND

3. ✓ XNOR

4. ✗ AND

Question Number : 135 Question Id : 2310981335 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0.66

How many select lines are needed in a multiplexer (MUX) with 1024 inputs and one output?

Options :

1. ✗ 16

2. ✗ 14

3. ✗ 12

4. ✓ 10

Question Number : 136 Question Id : 2310981336 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0.66

Which logic device is called a data distributor?

Options :

1. ✗ Multiplexer (MUX)

2. ✓ Demultiplexer (DEMUX)

3. ✗ Encoder

4. ✗ Decoder

Question Number : 137 Question Id : 2310981337 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0.66

www.prepp.in An n-variable K-map has _____ cells.

Options :

1. ✖ $2n$

2. ✔ 2^{2n}

3. ✖ $\log_2 2n$

4. ✖ 2^n

Question Number : 138 Question Id : 2310981338 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

A DEMUX with an 8-bit select input has:

Options :

1. ✔ one data input and 256 data outputs.

2. ✖ one data input and 16 data outputs.

3. ✖ one data input and 64 data outputs.

4. ✖ one data input and 128 data outputs.

Question Number : 139 Question Id : 2310981339 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

A sequential circuit with twelve states will have:

Options :

1. ✖ 10 flip-flops

2. ✖ 8 flip-flops

3. ✖ 4 flip-flops

Question Number : 140 Question Id : 2310981340 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0.66

The output of a clocked sequential circuit is independent of the input. The circuit can be represented by a/an:

Options :

1. ✖ mealy machine

2. ✔ moore machine

3. ✖ combinational circuit

4. ✖ neither moore nor mealy machine

Question Number : 141 Question Id : 2310981341 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0.66

A Modulo-10 counter has _____ states.

Options :

1. ✖ 1024

2. ✖ 512

3. ✖ 16

4. ✔ 10

Question Number : 142 Question Id : 2310981342 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0.66

In order to generate a 1 Hz clock from a 60 Hz clock, we need to cascade the _____ counter with the _____ counter.

Options :

1. ✓ modulo-10, modulo-6
2. ✗ modulo-16, modulo-4
3. ✗ modulo-12, modulo-7
4. ✗ modulo-12, modulo-6

Question Number : 143 Question Id : 2310981343 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3 Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

A logic circuit that receives several data inputs and allows only one of them at a time to pass to the output is called a/an:

Options :

1. ✓ multiplexer (MUX)
2. ✗ demultiplexer (DEMUX)
3. ✗ transmitter
4. ✗ receiver

Question Number : 144 Question Id : 2310981344 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3 Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The fastest ADC is:

Options :

1. ✗ counter type
2. ✓ flash type

3. ✖ successive approximation type

4. ✖ dual-slope type

Question Number : 145 Question Id : 2310981345 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0.66

The memory technology that needs the least power is:

Options :

1. ✖ ECL

2. ✖ MOS

3. ✔ CMOS

4. ✖ TTL

Question Number : 146 Question Id : 2310981346 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0.66

To realise a $512k \times 8$ memory, how many $32k \times 4$ memory chips are needed?

Options :

1. ✖ 64

2. ✔ 32

3. ✖ 16

4. ✖ 14

Question Number : 147 Question Id : 2310981347 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0.66

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The number of cells in a $1k \times 4$ memory is:

Options :

1. ✖ 1024

2. ✖ 2048

3. ✔ 4096

4. ✖ 4000

Question Number : 148 Question Id : 2310981348 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The number of flags in the Intel 8085 microprocessor is:

Options :

1. ✖ 8

2. ✖ 7

3. ✖ 6

4. ✔ 5

Question Number : 149 Question Id : 2310981349 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

The non-maskable interrupt (NMI) in Intel 8085 microprocessor is:

Options :

1. ✖ RST 7.5

2. ✖ RST 6.5

3. ✖ INTR

4. ✔ TRAP

Question Number : 150 Question Id : 2310981350 Question Type : MCQ Option Shuffling : Yes Negative Marks Display Text : 2/3
Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0.66

What will be the content of port #7 when the following program code is executed:

```
MVI A, FFH; XRA A; OUT 07H
```

Options :

1. ✖ FFH

2. ✖ 07H

3. ✖ FEH

4. ✔ 00H