

# 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.

<b>Question Paper Name :</b>	Biomedical Engineering 31st May 2023 Shift 2
<b>Subject Name :</b>	Biomedical Engineering
<b>Creation Date :</b>	2023-05-31 16:35:22
<b>Duration :</b>	120
<b>Total Marks :</b>	120
<b>Display Marks:</b>	No
<b>Share Answer Key With Delivery Engine :</b>	Yes
<b>Actual Answer Key :</b>	Yes
<b>Calculator :</b>	None
<b>Magnifying Glass Required? :</b>	No
<b>Ruler Required? :</b>	No
<b>Eraser Required? :</b>	No
<b>Scratch Pad Required? :</b>	No
<b>Rough Sketch/Notepad Required? :</b>	No
<b>Protractor Required? :</b>	No
<b>Show Watermark on Console? :</b>	Yes
<b>Highlighter :</b>	No
<b>Auto Save on Console?</b>	Yes
<b>Change Font Color :</b>	No

<b>Change Background Color :</b>	No
<b>Change Theme :</b>	No
<b>Help Button :</b>	No
<b>Show Reports :</b>	No
<b>Show Progress Bar :</b>	No

## **Biomedical Engineering**

<b>Group Number :</b>	1
<b>Group Id :</b>	28393672
<b>Group Maximum Duration :</b>	0
<b>Group Minimum Duration :</b>	120
<b>Show Attended Group? :</b>	No
<b>Edit Attended Group? :</b>	No
<b>Break time :</b>	0
<b>Group Marks :</b>	120
<b>Is this Group for Examiner? :</b>	No
<b>Examiner permission :</b>	Cant View
<b>Show Progress Bar? :</b>	No

## **Mathematics**

<b>Section Id :</b>	283936193
<b>Section Number :</b>	1
<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	10
<b>Number of Questions to be attempted :</b>	10
<b>Section Marks :</b>	10
<b>Enable Mark as Answered Mark for Review and</b>	

Yes Clear

Response :

Maximum Instruction Time :

0

Sub-Section Number :

1

Sub-Section Id :

283936193

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 1 Question Id : 28393610001 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 eigenvector of the matrix  $A = \begin{bmatrix} 1 & 2 \\ 0 & 2 \end{bmatrix}$  is in the form  $\begin{bmatrix} 1 \\ k_1 \end{bmatrix}$ , ( $k_1 \neq 0$ ), then  $k_1 =$

Options :

1.   $\frac{1}{2}$

2.   $\frac{1}{3}$

3.   $\frac{1}{4}$

4.   $\frac{1}{5}$

Question Number : 2 Question Id : 28393610002 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 1, 2, 3 are the eigenvalues of a square matrix  $A$ , then the eigenvalues of  $3A^3 - 6A + 2I$  are

Options :

1. ✘ -1, 14, 9

2. ✘ -1, 4, 65

3. ✔ -1, 14, 65

4. ✘ 1, 14, 65

Question Number : 3 Question Id : 28393610003 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  $\int_0^a \int_0^{\sqrt{a^2-y^2}} \sqrt{a^2-x^2-y^2} dx dy$  is

Options :

1. ✘  $\frac{\pi}{3} a^3$

2. ✘  $\frac{\pi}{4} a^3$

3. ✘  $\frac{\pi}{5}a^3$

4. ✔  $\frac{\pi}{6}a^3$

Question Number : 4 Question Id : 28393610004 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  $\int_C (x^2 + xy)dx + (x^2 + y^2)dy$ , where  $C$  is the square formed by the lines

$x = \pm l, y = \pm l$ , is

Options :

1. ✘ -1

2. ✔ 0

3. ✘ 1

4. ✘ 2

Question Number : 5 Question Id : 28393610005 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 residue of the function  $f(z) = \frac{z}{(z-1)(z-2)^2}$  at the point which lie inside the circle

$$|z-2| = \frac{1}{2} \text{ is}$$

**Options :**

1. ✘ 2

2. ✘ 1

3. ✔ -1

4. ✘ -2

**Question Number : 6 Question Id : 28393610006 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**

Let  $K$  be the standard error of a sample of size  $n$  taken from an infinite population. If the sample size is increased to  $9n$ , then the standard error of this new sample is

**Options :**

1. ✔  $K/3$

2. ✘  $3K$

3. ✘  $K+3$

4. ✘  $K-3$

Question Number : 7 Question Id : 28393610007 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 coefficient of the correlation between the two variables  $X$  and  $Y$  is 0.48 and the covariance is 48 also the variance of  $Y$  is 64, then the standard deviation of  $X$  is

Options :

1. ✘ 11.5

2. ✔ 12.5

3. ✘ 13.5

4. ✘ 14.5

Question Number : 8 Question Id : 28393610008 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

Particular integral of  $(D^3 - 3D^2 + 3D - 1)y = x^2 e^x$ , where  $D^n = \frac{d^n}{dx^n}$ , is \_\_\_\_\_

Options :

1. ✔  $\frac{x^5 e^x}{60}$

2. ✘  $\frac{x^4 e^x}{12}$

3. ✘  $\frac{x^3 e^x}{3}$

4. ✘  $\frac{x^2 e^x}{2}$

Question Number : 9 Question Id : 28393610009 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 solution of  $\frac{\partial u}{\partial x} = 2 \frac{\partial u}{\partial t} + u$  where  $u(x, 0) = 6e^{-3x}$  is

Options :

1. ✘  $6e^{-3x-2t}$

2. ✘  $6e^{-3x+2t}$

3. ✔  $6e^{-3x+t}$

4. ✘  $6e^{-x-t}$

Question Number : 10 Question Id : 28393610010 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 Iterative formula to find the reciprocal of a given number  $N$  by Newton's method is

Options :

1. ✘  $x_{i+1} = x_i(2 + Nx_i)$

2. ✘  $x_{i+1} = x_i(N - 2x_i)$

3. ✘  $x_{i+1} = x_i(N + 2x_i)$

4. ✔  $x_{i+1} = x_i(2 - Nx_i)$

## Biomedical Engineering

Section Id :	283936194
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 : 283936194  
Question Shuffling Allowed : Yes  
Is Section Default? : null

Question Number : 11 Question Id : 28393610011 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 nature of the voltage source to be connected to a series inductor to have a constant direct current is \_\_\_\_\_.

Options :

1. ✘ Constant voltage source
2. ✘ Linearly increasing voltage source
3. ✔ An ideal impulse
4. ✘ Exponentially increasing voltage

Question Number : 12 Question Id : 28393610012 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 practical current source is represented as \_\_\_\_\_.

Options :

1. ✘ Ideal current source in series with a resistance

2. ✘ Ideal voltage source in parallel with a resistance
3. ✔ Ideal current source in parallel with a resistance
4. ✘ Dependent voltage source in parallel with resistance

Question Number : 13 Question Id : 28393610013 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 capacitor is charged by a symmetrical square wave current source, then the steady state voltage across the capacitor will be a \_\_\_\_\_.

Options :

1. ✘ Square wave
2. ✔ Triangular wave
3. ✘ Step function



4. Impulse function

Question Number : 14 Question Id : 28393610014 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 light bulbs of 40W and 60W rating are connected in series across the mains, then \_\_\_\_\_.

Options :

1. The bulbs consume 100W together
2. The bulb consumes 50W together
3. The 60W bulb glows brighter
4. The 40W bulb glows brighter

Question Number : 15 Question Id : 28393610015 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 resistances between the terminals A and B, B and C, A and C of a star network are  $6\Omega$ ,  $11\Omega$   
and  $9\Omega$  respectively. Find the resistances  $R_A$ ,  $R_B$ ,  $R_C$ .

Options :

1.  $R_A = 4\Omega$ ,  $R_B = 2\Omega$ ,  $R_C = 5\Omega$

- ✘
2. ✔  $R_A = 2\Omega, R_B = 4\Omega, R_C = 7\Omega$
  3.  $R_A = 3\Omega, R_B = 3\Omega, R_C = 4\Omega$
  4. ✘  $R_A = 5\Omega, R_B = 1\Omega, R_C = 10\Omega$

Question Number : 16 Question Id : 28393610016 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 contains only independent current sources and resistors. If the values of all resistors are doubled, the values of the node voltages \_\_\_\_\_.

Options :

1. ✘ Will become half
2. ✘ Will remain unchanged
3. ✔ Will become double
4. ✘ Cannot be determined unless the circuit configuration and the values of the resistors are known

Question Number : 17 Question Id : 28393610017 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 RMS value of a half-wave rectified symmetrical square wave current of 2A is \_\_\_\_\_

**Options :**

1.   $\sqrt{2}$  A

2.  1 A

3.   $\frac{1}{\sqrt{2}}$  A

4.   $\sqrt{3}$  A

**Question Number : 18 Question Id : 28393610018 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**

Currents  $i_1$ ,  $i_2$  and  $i_3$  meet at a junction (node) in a circuit. All currents are marked as entering the node. If  $i_1 = -6\sin(\omega t)$  mA and  $i_2 = 8 \cos(\omega t)$  mA, then  $i_3$  will be \_\_\_\_\_.

**Options :**

1.   $10 \cos(\omega t + 36.87)$  mA

2.   $14 \cos(\omega t + 36.87)$  mA

3.   $-14 \sin(\omega t + 36.87)$  mA

4.   $-10 \cos(\omega t + 36.87)$  mA



**Question Number : 19 Question Id : 28393610019 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 series RLC circuit at resonance, the magnitude of the voltage developed across the capacitor \_\_\_\_\_.

Options :

1. ✘ Is always zero
2. ✘ Can never be greater than the input voltage
3. ✔ Can be greater than the input voltage and is  $90^\circ$  out of phase with the input voltage
4. ✘ Can be greater than the input voltage and is in phase with the input voltage

Question Number : 20 Question Id : 28393610020 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 Q-factor given by \_\_\_\_\_ where  $f_1$  and  $f_2$  are half power frequencies and  $f_0$  is the resonant frequency.

Options :

1. ✘  $\frac{f_1 + f_2}{2f_0}$

2. ✘  $\frac{f_1 - f_0}{f_2 - f_0}$

3. ✔  $\frac{f_0}{f_1 - f_2}$



4. ✘  $\frac{f_2 - f_1}{f_0}$

Question Number : 21 Question Id : 28393610021 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 optimal Wiener filter can be designed if the signal is statistically \_\_\_\_\_ and noise is a stationary random process that is statistically \_\_\_\_\_ the signal

Options :

1. ✘ stationary, dependent on
2. ✘ non-stationary, independent of
3. ✘ non-stationary, dependent on
4. ✔ stationary, independent of

Question Number : 22 Question Id : 28393610022 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

Real-time processing speeds can be achieved for QRS detection by using digital filters with only \_\_\_\_\_ coefficients.

Options :

1. ✔ integer

2. ✘ floating point

3. ✘ positive

4.

✘ negative

Question Number : 23 Question Id : 28393610023 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

\_\_\_\_\_ can be employed to detect the spike-and-wave complex in the EEG signal.

Options :

1. ✘ HPF

2. ✘ Wiener filter

3. ✔ Template matching

4. ✘ Fourier Filter

Question Number : 24 Question Id : 28393610024 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 sleep pattern of a subject is analyzed through \_\_\_\_\_.

Options :

1. ✘ Event detection
2. ✘ Adaptive technique
3. ✔ Morkov model



#### 4. LMS algorithm

Question Number : 25 Question Id : 28393610025 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

Temporal MA filtering is suitable only when \_\_\_\_\_.

Options :

1. ✘ the noise is stationary random process that is statistically independent of the signal
2. ✘ the noise is stationary random process that is uncorrelated with the signal
3. ✔ the signal is of relatively low frequency and is statistically stationary at least over the moving window duration
4. ✘ on-line, real-time filtering is not required

Question Number : 26 Question Id : 28393610026 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

While employing Pan-Tompkins algorithm for QRS detection, the sequence of tasks are

\_\_\_\_\_.

Options :

- ✘
- ✘ high pass filtering, squaring, integrating and moving-window averaging
  - ✘ low pass filtering, squaring, differentiating and moving-window integration
  - high pass filtering, squaring, differentiating and moving-window integration
  - ✔ bandpass filtering, differentiating, squaring and moving-window integration

Question Number : 27 Question Id : 28393610027 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

\_\_\_\_\_ cannot be the Fourier series expansion of a periodic signal.

Options :

- ✘  $x(t) = 2 \cos(t) + 3 \cos(3t)$
- ✔  $x(t) = 2 \cos(\pi t) + 7 \cos(t)$
- ✘  $x(t) = \cos(t) + 0.5$
- ✘  $x(t) = 2 \cos(1.5\pi t) + \sin(3.5\pi t)$

Question Number : 28 Question Id : 28393610028 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  $x(t)$  is the input and  $4x(t-2)$  is the output of a linear time-invariant system, its transfer function is

\_\_\_\_\_.

Options :

1.  $4e^{j4\pi f}$

2.  $2e^{j8\pi f}$

3.  $4e^{-j4\pi f}$

4.  $2e^{-j8\pi f}$

Question Number : 29 Question Id : 28393610029 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 z-transform of a system is  $H(z) = \frac{z}{z-0.2}$ . If ROC is  $|z| = 0.2$ , then the impulse response of the

system is .....

Options :

1.  $(0.2)^n u[n]$

2.  $(0.2)^n u[-n-1]$

3.  $-(0.2)^n u[n]$



4. ✓  $-(0.2)^n u[-n-1]$

**Question Number : 30 Question Id : 28393610030 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 impulse response of a linear time-invariant system is  $h[n] = u[n + 3] + u[n-2] - 2u[n - 7]$  where  $u[n]$  is the unit step sequence. The given system is \_\_\_\_\_.

**Options :**

1. ✘ stable and causal
2. ✔ stable but not causal
3. ✘ causal but not stable
4. ✘ unstable and not causal

**Question Number : 31 Question Id : 28393610031 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 function  $f(t)$ ,  $-\infty < t < \infty$ , for which a Fourier series cannot be defined is \_\_\_\_\_.

**Options :**

1. ✘  $3 \sin (25 t)$
2. ✘  $4 \cos (20 t + 3) + 2 \sin (710 t)$
3. ✔  $\exp(-|t|) \sin (25 t)$
4. ✘ 1



Question Number : 32 Question Id : 28393610032 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 discrete time sequence  $[1, 0, 2, 3]$ , the 4-point DFT is \_\_\_\_\_.

Options :

1. ✘  $[2, 2+2j, 6, 2-2j]$

2. ✘  $[6, 1-3j, 0, 1+3j]$

3. ✔  $[6, -1+3j, 0, -1-3j]$

4. ✘  $[0, -2+2j, 2, -2-2j]$

Question Number : 33 Question Id : 28393610033 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

When two discrete time systems with impulse responses  $\delta[n-1]$  and  $\delta[n-2]$  are connected in cascade, the overall impulse response is \_\_\_\_\_.

Options :

1. ✔  $\delta[n-3]$

2. ✘  $\delta[n-1] + \delta[n-2]$

3. ✘  $\delta[n-1]\delta[n-2]$

4. ✘  $\delta[n-2]$

Question Number : 34 Question Id : 28393610034 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 operations to be performed to realize linear phase IIR filter are as follows:

- (i) Passing  $x(-n)$  through a digital filter  $H(z)$
- (ii) Time reversing the output of  $H(z)$
- (iii) Time reversal of the input signal  $x(n)$
- (iv) Passing the result through  $H(z)$

The correct order of these operations is \_\_\_\_\_.

Options :

1. ✘ (i), (ii), (iii), (iv)

2. ✔ (iii), (i), (ii), (iv)

3. ✘ (ii), (iii), (iv), (i)

4. ✘ (i), (iii), (iv), (ii)

Question Number : 35 Question Id : 28393610035 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

FIR filters are \_\_\_\_\_ and \_\_\_\_\_.

Options :

1. ✘ Recursive, do not use feedback
2. ✘ Recursive, use feedback
3. ✔ Non-recursive, do not use feedback
4. ✘ Non-recursive, use feedback

Question Number : 36 Question Id : 28393610036 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

Arrange common base (CB), common emitter (CE) and common collector (CC) in the decreasing order of their input resistance.

Options :

1. ✘ CB, CE, CC
2. ✔ CC, CE, CB
3. ✘ CC, CB, CE

4. ✘ CE, CC, CB

Question Number : 37 Question Id : 28393610037 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

Negative feedback in an amplifier

Options :

1. ✘ Reduces bandwidth

2. ✘ Increases frequency

3. ✔ Reduces gain

4. ✘ Increases noise

Question Number : 38 Question Id : 28393610038 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 FET, as  $V_{GS}$  is changed from zero to increasing reverse bias, the value of  $g_m$  is .....

Options :

1. ✔ Decreased

2. ✘ Increased

3. ✘ Constant

4. ✘ Zero

Question Number : 39 Question Id : 28393610039 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

Mobility of an electron in a conductor is expressed in terms of.....

Options :

1. ✔  $\text{cm}^2/\text{v-s}$

2. ✘  $\text{cm}/\text{v-s}$

3. ✘  $\text{cm}^2/\text{v}$

4. ✘  $\text{cm}/\text{s}$

Question Number : 40 Question Id : 28393610040 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 maximum ac power delivered to an ideal class A series fed amplifier is 1Watt, then maximum transistor dissipation capability is..... Watt.

Options :

1. ✘ 1

2. ✔ 2

3. ✘ 3

4. ✘ 0

Question Number : 41 Question Id : 28393610041 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 bandwidth of an RF tuned amplifier is dependent on Q-factor of .....

Options :

1. ✔ Tuned output circuit

2. ✘ Tuned input circuit

3. ✘ Operating point

4. ✘ Output, input circuits and quiescent point

Question Number : 42 Question Id : 28393610042 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 number of 4x1 and 2x1 multiplexers required to construct a 32x1 multiplexer is .....

Options :

1. ✘ 8, 0

2. ✔ 12, 1

3. ✘ 8, 2

4. ✘ 12, 2

Question Number : 43 Question Id : 28393610043 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 ripple counter and a 4-bit synchronous counter are constructed using flip-flops with a propagation delay of 10 ns each. If the worst-case delay in the ripple counter and the synchronous counter be R and S respectively, then

Options :

1. ✔ R = 40 ns and S = 10 ns

2. ✘ R = 10 ns and S = 40 ns

3. ✘  $R = 10 \text{ ns}$  and  $S = 30 \text{ ns}$

4. ✘  $R = 30 \text{ ns}$  and  $S = 10 \text{ ns}$

Question Number : 44 Question Id : 28393610044 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

What is the range of signed decimal numbers that can be represented by 6-bit 1's complement number?

Options :

1. ✘ -32 to +31

2. ✘ -63 to +63

3. ✔ -31 to +31

4. ✘ -64 to +63

Question Number : 45 Question Id : 28393610045 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 has an open loop voltage gain of -500. This gain is reduced to -100 when negative feedback is applied. The reverse transmission factor  $\beta$  of the system is:

Options :



1. ✘ -0.008

2. ✔ -0.025

3. ✘ 0.1

4. ✘ -0.2

Question Number : 46 Question Id : 28393610046 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-chip data acquisition system incorporates

Options :

1. ✘ An ADC and a multiplexer

2. ✘ An ADC and a DAC

3. ✘ A DAC and a demultiplexer

4. ✔ An ADC and a demultiplexer

Question Number : 47 Question Id : 28393610047 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 output of a 2-bit comparator is logic 1 whenever 2-bit input A is greater than the 2-bit input B.

The number of combinations for which the output is logic 1 is \_\_\_\_\_.

**Options :**

1. ✘ 4

2. ✔ 6

3. ✘ 8

4. ✘ 10

**Question Number : 48 Question Id : 28393610048 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 mod 8 counter is also called.....

**Options :**

1. ✔ Divided by 8 counters

2. ✘ Divided by 16 counters

3. ✘ Divided by 4 counters

4. ✘ Divided by 32 counters

Question Number : 49 Question Id : 28393610049 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

Registers in memory generally use ..... flip flops.

Options :

1. ✘ RS flip flop

2. ✘ T flip flop

3. ✘ JK flip flop

4. ✔ D flipflop

Question Number : 50 Question Id : 28393610050 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 microprocessor, the service routine for a certain interrupt starts from a fixed memory location which cannot be externally set, but the interrupt can be delayed or rejected. Such an interrupt is

\_\_\_\_\_.

Options :

1. ✘ maskable and non-vectorred

2. ✘ non-maskable and vectored

3. ✓ maskable and vectored

4. ✗ non-maskable and non-vectored

Question Number : 51 Question Id : 28393610051 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

Each cell of an SRAM contains.....

Options :

1. ✓ 6 MOS transistors

2. ✗ 4MOS transistors and 2 capacitors

3. ✗ XOR gates and shift registers

4. ✗ 1 flip flop

Question Number : 52 Question Id : 28393610052 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 width of data bus and address bus of a 4Kx16 bit memory chip is.....

Options :

1. ✘ 4, 16

2. ✘ 16, 4

3. ✔ 16, 12

4. ✘ 12, 16

Question Number : 53 Question Id : 28393610053 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 one of the following is not true about program counter?

Options :

1. ✘ It holds the address of the next instruction

2. ✘ Its value is stacked when there is a subroutine

3. ✔ It is an 8-bit register

4. ✘ Its value is stacked when there is an interrupt routine

Question Number : 54 Question Id : 28393610054 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 interrupts are maskable and non-vectored?

Options :

1. ✘ RST5.5

2.

✘ RST6.5

3. ✘ TRAP

4. ✔ INTR

Question Number : 55 Question Id : 28393610055 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 is not on-chip of a microcontroller?

Options :

1. ✔ DMA

2. ✘ UART

3. ✘ Memory

4. ✘ IO ports

Question Number : 56 Question Id : 28393610056 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 closed loop transfer function of a system is given by  $K/(s+5)(s^2+2)$ . The system is

\_\_\_\_\_.

Options :

1. ✘ stable
2. ✘ unstable
3. ✔ marginally stable
4. ✘ asymptotically stable.

Question Number : 57 Question Id : 28393610057 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 open loop transfer function of a system is given by  $1/(1+s)(1+2s)$ . The polar plot of this

system \_\_\_\_\_.

Options :

1. ✘ crosses the negative real axis and does not cross the imaginary axis

2. ✓ crosses the imaginary axis and does not cross the real axis
3. ✗ crosses both the imaginary and real axes
4. ✗ does not cross both the real and imaginary axes

Question Number : 58 Question Id : 28393610058 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 errors are caused by inherent short comings of the instrument and component used?

Options :

1. ✗ Gross errors
2. ✓ Systemic errors
3. ✗ Random errors
4. ✗ Negligent errors

Question Number : 59 Question Id : 28393610059 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 Permanent Magnet Moving Coil the angular deflection of the coil is proportional to .....



**Options :**

1. ✓ Current through the coil
2. ✗ Deflecting torque
3. ✗ Angle between the plane of the coil and direction of field
4. ✗ Static sensitivity of the coil

**Question Number : 60 Question Id : 28393610060 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 is the device that can measure self inductance, self capacitance and self resistance?**

**Options :**

1. ✗ Galvanometer
2. ✗ Anderson's bridge
3. ✗ Maxwell's bridge
4. ✓ Q-meter

**Question Number : 61 Question Id : 28393610061 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 voltage pacemaker the current in the circuit is determined by the available \_\_\_\_\_.

Options :

1. ✘ Contact impedance at the site
2. ✘ Resistance of the tissue
3. ✔ Voltage during the entire duration of the impulse
4. ✘ Voltage during the rising phase of the impulse

Question Number : 62 Question Id : 28393610062 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

What is the material used to make pacemaker electrodes?

Options :

1. ✘ Platinum
2. ✔ Platinum-iridium alloy
3. ✘ Silver-silver chloride
4. ✘ Silver

Question Number : 63 Question Id : 28393610063 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

There is provision for automatic adjustment of stimulus intensity and gains for the various sensing channels in \_\_\_\_.

Options :

1. ✘ Fixed Pacemakers
2. ✘ Atrial Triggered Pacemakers
3. ✘ Demand Pacemakers
4. ✔ Dual Chamber Pacemakers

Question Number : 64 Question Id : 28393610064 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 modern biopotential amplifiers, the input impedance is atleast \_\_\_\_\_.

Options :

1. ✘ 100 M $\Omega$
2. ✘ 1000 k $\Omega$

3. ✓ 10 MΩ

4. ✗ 100 kΩ

Question Number : 65 Question Id : 28393610065 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 calibration signal amplitude gives an indication of correct \_\_\_\_\_ settings.

Options :

1. ✓ sensitivity

2. ✗ linearity

3. ✗ precision

4. ✗ accuracy

Question Number : 66 Question Id : 28393610066 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

Advisory external defibrillators use self-adhesive electrodes because the signal acquired from  
them \_\_\_\_\_.

Options :

1. ✘ More noise but allows for faster accurate analysis.
2. ✘ Allows quick calibration and has low noise
3. ✔ Has less noise and allows for faster accurate analysis.
4. ✘ Allows quick calibration and faster analysis

Question Number : 67 Question Id : 28393610067 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 most commonly used hemodialyzer:

Options :

1. ✘ parallel plate dialyzer
2. ✔ hollow fiber dialyzer
3. ✘ membrane dialyzer
4. ✘ bubble dialyzer

Question Number : 68 Question Id : 28393610068 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 negative pressure in dialysate pressure control and measurement system of haemodialysis machine is limited by \_\_\_\_\_

Options :

1. ✘ control valve

2. ✘ fluid valve

3. ✔ relief valve

4. ✘ safety valve

Question Number : 69 Question Id : 28393610069 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 velocity of blood flow is 'V' and that of ultra sound through the medium is 'C'. If an ultrasonic signal at frequency f is directed at right angles to the flow, then the Doppler shifted frequency is \_\_\_\_\_.

Options :

1. ✔ zero

2. ✘  $\left(\frac{V}{C}\right) \times f$

3. ✘  $\left(\frac{C}{V}\right) \times f$

4. ✘  $\frac{2Vf}{C}$

Question Number : 70 Question Id : 28393610070 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 transformer voltage induced in A.C. excited electromagnetic blood flow meters is minimised  
by \_\_\_\_\_.

Options :

1. ✘ Low pass filter

2. ✘ Band pass filter

3. ✘ High pass filter

4. ✔ Phase sensitive demodulator

Question Number : 71 Question Id : 28393610071 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 driven right leg ECG amplifier, the right leg is connected to the

Options :

1. ✘ ground
2. ✘ inverting input of the op-amp
3. ✔ common mode potential
4. ✘ non-inverting input of the op-amp

Question Number : 72 Question Id : 28393610072 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 thermocouple, the thermal energy is converted to electrical energy by \_\_\_\_\_.

Options :

1. ✘ Johnson effect
2. ✔ Seebeck effect
3. ✘ Hall effect
4. ✘ Faraday effect



Question Number : 73 Question Id : 28393610073 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 spirometer performs the physical integration of \_\_\_\_\_.

Options :

1. ✘ Air pressure at the mouth
2. ✘ Air pressure at the nose
3. ✘ Air flow at the nose
4. ✔ Air flow at the mouth

Question Number : 74 Question Id : 28393610074 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 blood pressure measurement by auscultatory method, what is the range of the Korotkoff sounds?

Options :

1. ✘ 0 to 20 Hz
2. ✔ 20 to 100 Hz
3. ✘ 100 to 1000 Hz

4. ✘ 100 to 2000 Hz

Question Number : 75 Question Id : 28393610075 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

Normal EEG frequency range is \_\_\_\_\_

Options :

1. ✘ 50-500Hz

2. ✘ 0.5-50HZ

3. ✘ 0.05-5Hz

4. ✔ 1-200Hz

Question Number : 76 Question Id : 28393610076 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 X-ray tube, the filament and the target are enclosed in an envelope that \_\_\_\_\_.

Options :

1. ✔ Provides vacuum and support

2. ✘ Prevents cathode failure.
3. ✘ Prevents anode melt down.
4. ✘ Provides free air for cooling

Question Number : 77 Question Id : 28393610077 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

Coil dialyzers are characterized by \_\_\_\_\_ resistance to blood and \_\_\_\_\_ dialysate flow rates.

Options :

1. ✘ low, high
2. ✘ low, low
3. ✘ high, low
4. ✔ high, high

Question Number : 78 Question Id : 28393610078 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 EEG machine, \_\_\_\_\_ serves as the calibration signal.

Options :

1. ✓ 5-1000  $\mu\text{V}$  peak-to-peak rectangular wave
2. ✗ rectangular wave of 50-100  $\mu\text{V}$  peak-to-peak
3. ✗ rectangular wave of 1-500  $\mu\text{V}$  peak-to-peak
4. ✗ 5-100  $\mu\text{V}$  peak-to-peak rectangular wave

Question Number : 79 Question Id : 28393610079 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 order in which the temperature transducers exhibit non-linearity (highest to lowest):

Options :

1. ✗ Thermocouple, RTD, Thermistor
2. ✓ Thermistor, Thermocouple, RTD
3. ✗ Thermistor, RTD, Thermocouple
4. ✗ RTD, Thermocouple, Thermistor

Question Number : 80 Question Id : 28393610080 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

Sensitivity of LVDT is calculated as \_\_\_\_\_.

Options :

1. ✘ 
$$\text{Sensitivity} = \frac{V_{\text{output}}}{V_{\text{primary}}}$$

2. ✔ 
$$\text{Sensitivity} = \frac{V_{\text{output}}}{\text{Core Displacement}}$$

3. ✘ 
$$\text{Sensitivity} = \frac{V_{\text{primary}}}{V_{\text{output}} \times \text{Core Displacement}}$$

4. ✘ 
$$\text{Sensitivity} = \frac{V_{\text{output}}}{V_{\text{primary}} \times \text{Core Displacement}}$$

Question Number : 81 Question Id : 28393610081 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 in-vivo oximetry, the blood is \_\_\_\_\_ and both techniques \_\_\_\_\_ and \_\_\_\_\_ can be used.

Options :

1. ✔ unhemolyzed, reflection and transmission

2. ✘ hemolysed, scattering and transmission

3. ✘ unhemolysed, scattering and transmission

4. ✘ hemolysed, transmission and reflection

Question Number : 82 Question Id : 28393610082 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

Synchronised intermittent mandatory ventilation combines \_\_\_\_ breathing and \_\_\_\_ ventilation.

Options :

1. ✘ Cellular, spontaneous

2. ✘ Cellular, alveolar

3. ✔ Spontaneous, mechanical

4. ✘ Cellular, mechanical

Question Number : 83 Question Id : 28393610083 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 has \_\_\_\_\_ parts and it is \_\_\_\_\_.

Options :

1. ✘ Moving, linear
2. ✘ No moving, linear
3. ✘ Moving, non-linear
4. ✔ No moving, non-linear

Question Number : 84 Question Id : 28393610084 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 bandwidth of Phonocardiography for recording of the indirect carotid, jugular and apex cardiogram pulses:

Options :

1. ✘ 30 to 1000 Hz
2. ✘ 0 to 70 Hz
3. ✔ 0.1 to 100 Hz
4. ✘ 10 to 500 Hz

Question Number : 85 Question Id : 28393610085 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 amplitude of EMG signals depend upon which of the following factor?

Options :

1. ✘ Respiration
2. ✔ Position of electrode
3. ✘ Blood Resistivity
4. ✘ Ventricular Volume

Question Number : 86 Question Id : 28393610086 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 stimulation of \_\_\_\_\_ is required for the membrane potential to rise to the threshold at the axon hillock.

Options :

1. ✘ pre-synaptic membrane along the dendrite and cell body
2. ✘ dendrite
3. ✘ cell body



4. ✓ post synaptic membrane along the dendrite and cell body

Question Number : 87 Question Id : 28393610087 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

During an action potential propagation in an unmyelinated nerve fiber the \_\_\_\_\_ region is small relative to the fiber \_\_\_\_\_.

Options :

1. ✘ Amplitude of the activation wave, length

2. ✘ Diameter of the passive, length

3. ✓ length of the active, length

4. ✘ Diameter of the passive, diameter

Question Number : 88 Question Id : 28393610088 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 gas exchange to occur, the surface area contributed by the alveoli in each normal lung is around \_\_\_\_\_ m<sup>2</sup>.

Options :

1. ✓ 70

2. ✘ 30

3. ✘ 100

4. ✘ 120

Question Number : 89 Question Id : 28393610089 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 peak systolic pressure in the right ventricle is \_\_\_\_\_ mm of Hg.

Options :

1. ✘ 60 – 100

2. ✘ 4 - 12

3. ✔ 15 – 30

4. ✘ < 6

Question Number : 90 Question Id : 28393610090 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 autonomic nervous system does NOT regulate the

Options :

1. ✘ Digestive system
2. ✘ Circulation
3. ✔ Skeletal muscles
4. ✘ Excretory system

Question Number : 91 Question Id : 28393610091 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

Starling's law of the heart states that \_\_\_\_\_.

Options :

1. ✔ if the radius of the heart increases, then the muscle tension and the systolic pressure increase
2. ✘ if the radius of the heart decreases, then the muscle tension and the systolic pressure increase
3. ✘ if the radius of the heart decreases, then the muscle tension decreases and the systolic pressure increases

4. ✘ if the radius of the heart increases, then the muscle tension increases and the systolic pressure decreases

**Question Number : 92 Question Id : 28393610092 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 pressure-volume work loop for a weakened ventricle shifts \_\_\_\_\_ as compared to the normal ventricle.

**Options :**

1. ✘ to the left
2. ✔ to the right
3. ✘ down
4. ✘ up

**Question Number : 93 Question Id : 28393610093 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 is a characterization technique used to measure Young's modulus of a biomaterial?

**Options :**

1. ✘ Tensile test

2. ✓ Compression test

3. ✗ Calculation from the stress-strain curve

4. ✗ Three- and four-point bend test

Question Number : 94 Question Id : 28393610094 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

Collagen, with an elastic modulus of approximately \_\_\_\_\_, is \_\_\_\_\_ than elastin.

Options :

1. ✓ 1GPa, stronger

2. ✗ 0.6 MPa, less stronger

3. ✗ 1MPa, stronger

4. ✗ 100 MPa, less stronger

Question Number : 95 Question Id : 28393610095 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 comparison to tendons, ligaments have:

Options :

1. ✘ More collagen, less elastin
2. ✔ More elastin, less collagen
3. ✘ More elastin, more collagen
4. ✘ Less elastin, less collagen

Question Number : 96 Question Id : 28393610096 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 circulatory system, which is the correct order in which the blood flows

Options :

1. ✔ Right ventricle, Semi-lunar valve, Pulmonary artery, Lungs
2. ✘ Left ventricle, Semi-lunar valve, Pulmonary artery, Lungs
3. ✘ Right ventricle, Semi-lunar valve, Pulmonary Vein, Lungs
4. ✘ Left ventricle, Semi-lunar valve, Pulmonary Vein, Lungs

Question Number : 97 Question Id : 28393610097 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

Examples of viscoelastic models are \_\_\_\_\_.

Options :

1. ✘ Wind Kessel and Kelvin
2. ✘ Voigt and thick-walled hemisphere
3. ✔ Maxwell and Standard solid
4. ✘ Wind Kessel and Voigt

Question Number : 98 Question Id : 28393610098 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 ratio of change in ventricular pressure to change in ventricular volume is a \_\_\_\_\_ measure of the ventricle and is called \_\_\_\_\_.

Options :

1. ✘ resistance, peripheral resistance
2. ✔ stiffness, elastance
3. ✘ stiffness, compliance
4. ✘ compliance, resistance

Question Number : 99 Question Id : 28393610099 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 distance between the heel strike of one foot and the next heel strike of the foot.

Options :

1. ✘ step length
2. ✔ stride length
3. ✘ step width
4. ✘ cadence

Question Number : 100 Question Id : 28393610100 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

\_\_\_\_\_ allows forward-backward and side to side movement and do not allow rotation.

Options :

1. ✘ Hinge joint
2. ✘ Ball and Socket joint



3. ✓ Condylloid joint

4. ✘ Gliding joint

Question Number : 101 Question Id : 28393610101 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 X-ray machine, \_\_\_\_\_ and \_\_\_\_\_ are employed for automatic exposure control.

Options :

1. ✘ Image intensifier, fluoroscopy

2. ✘ Gain control, photocell

3. ✘ Photocell, image intensifier Photo timer

4. ✓ Photocell, ionization chamber Photo timer

Question Number : 102 Question Id : 28393610102 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-mode ultrasound device shows \_\_\_\_\_ as an x-y plot and is used to measure the displacement of the \_\_\_\_\_.

Options :

1. ✘ Echo amplitude, mitral valve

2. ✘ Echo distance, cerebral midline
3. ✔ Echo intensity, brain midline
4. ✘ Echo amplitude, interventricular septum

Question Number : 103 Question Id : 28393610103 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 amplitude and the frequency of the NMR signals are used to assign \_\_\_\_\_ and \_\_\_\_\_.

Options :

1. ✘ Number of projections, orientation of the gradient
2. ✘ Orientation of the gradient, number of slices
3. ✔ Number of nuclei present, spatial location
4. ✘ Number of projections, spatial location

Question Number : 104 Question Id : 28393610104 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 ratio of the area of the input phosphor to the area of output phosphor in the image intensifier is

Options :

1. ✘ phosphorescence factor
2. ✘ phosphor factor
3. ✘ phosphor number
4. ✔ brightness gain

Question Number : 105 Question Id : 28393610105 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

As the active element diameter of the ultrasonic transducer increases, the beam width \_\_\_\_\_  
and therefore, lateral resolution \_\_\_\_\_.

Options :

1. ✘ Increases, improves
2. ✘ Does not change, does not change
3. ✔ Decreases, improves
4. ✘ Decreases, deteriorates

Question Number : 106 Question Id : 28393610106 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

NMR images that display T1 and T2 properties of the tissue provide very high contrasts between various soft tissues approaching \_\_\_\_\_ whereas it is only few percent with X-rays.

Options :

1. ✘ 1000%

2. ✘ 600%

3. ✔ 150%

4. ✘ 300%

Question Number : 107 Question Id : 28393610107 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 PET scanners constructed using a bismuth germinate detector have \_\_\_\_\_ and \_\_\_\_\_ than those with thallium-doped sodium iodide detector.

Options :

1. ✔ High resolution, high efficiency

2. ✘ low resolution, high efficiency

3. ✘ high resolution, low efficiency

4. ✘ Low resolution, low efficiency

**Question Number : 108 Question Id : 28393610108 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 factors playing an important role in the biological interaction of tissue and ultrasound waves are \_\_\_\_\_.

**Options :**

1. ✘ Frequency, wavelength and intensity

2. ✘ Time, frequency and duty cycle

3. ✘ Frequency, time and wavelength

4. ✔ Frequency, irradiation time, beam intensity and duty cycle

**Question Number : 109 Question Id : 28393610109 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 filters used to reduce the unwanted X-rays exposure to the patient are made of :

Options :

1. ✓ aluminium, copper
2. ✗ steel, lead
3. ✗ copper, aluminium
4. ✗ lead, copper

Question Number : 110 Question Id : 28393610110 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

Rad is a measure of \_\_\_\_\_ energy while Rem is a measure of \_\_\_\_\_.

Options :

1. ✗ incident, absorbed energy
2. ✗ absorbed, incident energy
3. ✗ biological damage caused, incident energy
4. ✓ absorbed, biological damage caused

Question Number : 111 Question Id : 28393610111 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

SPECT cameras detect only radio-nuclides that produce a \_\_\_\_\_ of single photons and these radio-nuclides \_\_\_\_\_ an on-site cyclotron.

Options :

1. ✘ single emission, do not require
2. ✘ cascaded emission, require
3. ✔ cascaded emission, do not require
4. ✘ single emission, require

Question Number : 112 Question Id : 28393610112 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 noise in a medical image will generally \_\_\_\_\_.

Options :

1. ✘ produce artifacts
2. ✘ produce blurring
3. ✔ reduce visibility of low contrast objects

4. ✘ produce image distortion

Question Number : 113 Question Id : 28393610113 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

Polymeric biomaterials are preferred due to:

Options :

1. ✘ hardness and stability

2. ✔ flexibility and stability

3. ✘ wear resistance applications

4. ✘ Load bearing applications

Question Number : 114 Question Id : 28393610114 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 material used for neural stimulation devices is \_\_\_\_\_.

Options :

1. ✔ Platinum



2. ✘ Stainless steel

3. ✘ Gold

4. ✘ Silver

Question Number : 115 Question Id : 28393610115 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 material used for a blood bag should have :

Options :

1. ✘ flexibility and optimal porosity

2. ✘ optimal porosity and relative inertness

3. ✘ reasonable brittleness and relative inertness

4. ✔ chemical stability and flexibility

Question Number : 116 Question Id : 28393610116 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

Alumina and Zirconia are examples of \_\_\_\_\_ bioceramics.

Options :

1. ✘ porous to allow tissue in growth
2. ✘ bioactive
3. ✘ resorbable
4. ✔ bioinert

Question Number : 117 Question Id : 28393610117 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 biomaterials are expected to mimic the functions of

Options :

1. ✔ Cell Organelles
2. ✘ Transmembrane proteins
3. ✘ Cytoplasm
4. ✘ Extracellular Matrix (ECM)

Question Number : 118 Question Id : 28393610118 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 most important aspects of biomaterial-tissue interactions.

Options :

1.  Biocompatibility
2.  Bioavailability
3.  Bioequivalence
4.  Bioluminescence

Question Number : 119 Question Id : 28393610119 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

Biodegradation will be more for materials with \_\_\_\_\_.

Options :

1.  More molecular weights and high crystallinity
2.  Low molecular weights and high crystallinity
3.  More molecular weights and less crystallinity

4. ✓ Low molecular weights and less crystallinity

Question Number : 120 Question Id : 28393610120 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

Image formation in electron microscope is based on \_\_\_\_\_

Options :

1.

✘ column length

2.

✘ electron number

3.

✓ differential scattering

4.

✘ specimen size