

Telangana State Council Higher Education

Notations :

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

Question Paper Name :Biomedical Engineering 30th May 2026 Shift
2**Subject Name :**

Biomedical Engineering

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Duration :

120

Total Marks :

120

Display Marks:

Yes

Share Answer Key With Delivery Engine :

Yes

Actual Answer Key :

Yes

Change Font Color :

No

Change Background Color :

No

Change Theme :

No

Help Button :

No

Show Reports :

No

Show Progress Bar :

No

Biomedical Engineering

Group Number :

1

Group Id :

10513146

Group Maximum Duration :

0

Group Minimum Duration :

120

Show Attended Group? :

No

Edit Attended Group? :

No

Break time :

0

Group Marks :

120

Mathematics

Section Id :

105131101

Section Number :

1

Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	10
Section Marks :	10
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	105131101
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 1051315881 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following cannot be an eigen value for an unitary matrix?

Options :

1. ✖ $\frac{1}{2} + \frac{\sqrt{3}}{2}i$

2. ✖ i

3. ✖ $-i$

4. ✔ $\frac{1}{2} + \frac{\sqrt{5}}{2}i$

Question Number : 2 Question Id : 1051315882 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If A is symmetric, P and B are skew symmetric matrices, then which of the following is correct?

Options :

1. ✖ $A^{13}B^{26} - B^{26}A^{13}$ is a symmetric matrix

2. ✖ $A^{26}P^{13} - P^{13}A^{26}$ is a skew symmetric matrix

3. ✔ $P^{13}A^{26} + A^{26}P^{13}$ is a skew symmetric matrix

4. ✖ $P^{13}B^{26} + B^{13}P^{26}$ is a skew symmetric matrix

Question Number : 3 Question Id : 1051315883 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The maximum value of x^2yz^3 , subject to $x+y+z=42$ exist at $(x,y,z)=(\alpha,\beta,\gamma)$, then $\alpha\beta\gamma =$

Options :

1. ✔ 6×7^3

2. ✖ 7×6^3

3. ✖ 8×7^4

4. ✖ 3×7^4

Question Number : 4 Question Id : 1051315884 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int_{-a}^a \int_0^x \frac{e^y}{(1+e^y)^2} dy dx =$$

Options :

1. ✖ a

2. ✖ e^a

3. ✖ e^{a^2}

4. ✔ 0

Question Number : 5 Question Id : 1051315885 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Given below are pair of functions $f(x)$ and $g(x)$. Which pair is not linearly independent?

Options :

1. ✖ $f(x) = \cos x + \sin x, g(x) = -6 \cos \frac{x}{3} - 8 \cos^3 \frac{x}{3}$
2. ✖ $f(x) = -\cos x + \sin x, g(x) = \cos x$
3. ✖ $f(x) = \cos x, g(x) = \cos^3 x - \sin^3 x$
4. ✔ $f(x) = \sin x, g(x) = 6 \sin \frac{x}{3} - 8 \sin^3 \frac{x}{3}$

Question Number : 6 Question Id : 1051315886 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The solution of $\frac{\partial^2 u}{\partial t^2} = 4 \frac{\partial^2 u}{\partial x^2}$, $t > 0$, $-\infty < x < \infty$ satisfying the conditions $u(x, 0) = x$
and $\frac{\partial u}{\partial t}(x, 0) = 0$ is

Options :

1. ✔ x
2. ✖ $\frac{x^2}{2} + t$
3. ✖ $x + 2t$
4. ✖ $\frac{t^2}{2} + x$

Question Number : 7 Question Id : 1051315887 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If A and B are independent events and $P\left(\left(\frac{A}{B}\right) \cup \left(\frac{B}{A}\right)\right) = k - P(A)P(B)$, then $k =$

Options :

1. ✖ $P(A) - P(B)$

2. ✖ $\frac{P(A)}{P(B)}$

3. ✖ $P(A)P(B/A)$

4. ✔ $P(A) + P(B)$

Question Number : 8 Question Id : 1051315888 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

From a set $\{1, 2, 3, 4, 5, 6, 7\}$ two numbers are selected at random. The random variable

X is defined as the absolute difference of the numbers selected. The mean of X is

Options :

1. ✖ 21

2. ✖ 4

3. ✔ $\frac{8}{3}$

4. ✖ $\frac{7}{2}$

Question Number : 9 Question Id : 1051315889 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Newton-Raphson method is used to find the root of $x^2 - 3 = 0$. If the initial solution is taken as $x = -2$, then the iterations tend to

Options :

1. ✖ $-\infty$

2. ✓ $-\sqrt{3}$

3. ✗ $\sqrt{3}$

4. ✗ zero

Question Number : 10 Question Id : 1051315890 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

While evaluating $\int_a^b f(x)dx$ using Trapezoidal rule and Simpson's one-third rule, $[a, b]$

is divided into n number of subintervals so that both the methods can be applied for the same division, then a possible value of n is

Options :

1. ✗ 5

2. ✓ 12

3. ✗ 7

4. ✗ Any non-prime number

Biomedical Engineering

Section Id :	105131102
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	110
Number of Questions to be attempted :	110
Section Marks :	110
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	105131102

Question Shuffling Allowed :

Yes

Question Number : 11 Question Id : 1051315891 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

At $t = \infty$ in RL circuit with DC excitation, inductor behaves as

Options :

1. ✖ Open circuit
2. ✖ Capacitor
3. ✔ Short circuit
4. ✖ Dependent source

Question Number : 12 Question Id : 1051315892 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a series RL circuit excited by DC, the current reaches 63.2% of final value at

Options :

1. ✖ $t = RC$
2. ✖ $t = \frac{1}{RC}$
3. ✖ $t = \frac{R}{L}$
4. ✔ $t = \frac{L}{R}$

Question Number : 13 Question Id : 1051315893 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $L = 1\text{H}$, $C = 1\text{F}$ and $R = 1\Omega$ in series RLC, then the circuit is

Options :

1. ✖ Pure oscillating
2. ✖ Critically damped
3. ✖ Overdamped
4. ✔ Underdamped

Question Number : 14 Question Id : 1051315894 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In series RLC circuit with $R = 10 \Omega$, $L = 0.1H$, $C = 100 \mu F$, the resonant frequency, Q-factor and bandwidth respectively are

Options :

1. ✔ 50 Hz, 3.14, 15.9 Hz
2. ✖ 50Hz, 2.15, 9 Hz
3. ✖ 40 Hz, 2.15, 9 Hz
4. ✖ 50 Hz, 3.14, 16 Hz

Question Number : 15 Question Id : 1051315895 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The cut-off frequency of RC low-pass filter is

Options :

1. ✔ $\frac{1}{(2\pi RC)}$
2. ✖ $2\pi RC$
3. ✖ $\frac{R}{(2\pi C)}$

4. ✖ $\frac{C}{(2\pi R)}$

Question Number : 16 Question Id : 1051315896 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If a circuit has unity power factor, then reactive power is

Options :

- 1. ✖ Maximum
- 2. ✔ Zero
- 3. ✖ Equal to active power
- 4. ✖ Infinite

Question Number : 17 Question Id : 1051315897 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Given $v(t) = 100 \sin(100\pi t)$, the RMS value is

Options :

- 1. ✖ 50 V
- 2. ✖ 100 V
- 3. ✔ 70.7 V
- 4. ✖ 141.4 V

Question Number : 18 Question Id : 1051315898 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Consider the following statements

Assertion (A): Norton current is equal to the short-circuit current at the output terminals.

Reason (R): Because Norton equivalent resistance is obtained by deactivating all independent sources and calculating the resistance seen from the output terminals.

The correct answer is

Options :

1. ✖ Both (A) and (R) are correct and (R) is the correct explanation of (A)
2. ✖ (A) is correct, but (R) is not correct
3. ✔ Both (A) and (R) are correct and (R) is not correct explanation of (A)
4. ✖ (A) is not correct, but (R) is correct

Question Number : 19 Question Id : 1051315899 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Thevenin resistance of a circuit is zero, then this implies

Options :

1. ✖ The circuit is open-circuited
2. ✖ The circuit behaves as an ideal current source
3. ✖ Maximum power transfer is impossible
4. ✔ The circuit behaves as an ideal voltage source

Question Number : 20 Question Id : 1051315900 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If admittance of a circuit is $Y = 0.3 - j0.4s$, then the magnitude of the impedance is

Options :

1. ✖ 1Ω

2. ✓ $2\ \Omega$

3. ✗ $5\ \Omega$

4. ✗ $10\ \Omega$

Question Number : 21 Question Id : 1051315901 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A signal that exists only for a finite duration of time is called

Options :

1. ✗ Periodic

2. ✓ Aperiodic

3. ✗ Even

4. ✗ Causal

Question Number : 22 Question Id : 1051315902 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In an operational amplifier, slew rate limitation affects

Options :

1. ✓ High frequency large signal response

2. ✗ Input offset

3. ✗ Bandwidth only

4. ✗ DC gain

Question Number : 23 Question Id : 1051315903 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For an active low-pass filter of first order, the roll-off is

Options :

1. ✖ -10 dB/dec
2. ✖ -40 dB/dec
3. ✔ -20 dB/dec
4. ✖ -60 dB/dec

Question Number : 24 Question Id : 1051315904 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

At very high frequencies, MOSFET is preferred because of

Options :

1. ✖ Infinite gain
2. ✖ Low threshold
3. ✖ High β
4. ✔ No minority carrier storage

Question Number : 25 Question Id : 1051315905 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In the ideal case, what is the input impedance of an operational amplifier?

Options :

1. ✔ Infinite
2. ✖ $1\text{M } \Omega$
3. ✖ Zero

4. ✖ $100\ \Omega$

Question Number : 26 Question Id : 1051315906 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The transfer function of an LTI system is defined as

Options :

1. ✖ Output signal
2. ✖ Frequency response
3. ✖ Impulse response
4. ✔ Ratio of Laplace transform of output to input (zero initial conditions)

Question Number : 27 Question Id : 1051315907 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

1's complement and 2's complement of $(19)_{16}$ in hexadecimal are

Options :

1. ✔ 06 and 07 respectively
2. ✖ 07 and 08 respectively
3. ✖ 07 and 07 respectively
4. ✖ 08 and 06 respectively

Question Number : 28 Question Id : 1051315908 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If the outputs of XNOR and XOR gates with inputs a, b are connected to an AND gate, then the output is

Options :

1. ✗ $a'b + ab'$
2. ✗ $ab + a'b'$
3. ✓ 0
4. ✗ 1

Question Number : 29 Question Id : 1051315909 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Discrete-time LTI system is BIBO stable if

Options :

1. ✓ The absolute sum of its impulse response converges
2. ✗ Its impulse response is finite
3. ✗ It has no poles
4. ✗ Its frequency response is zero

Question Number : 30 Question Id : 1051315910 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For a clock frequency of 20MHz, the output frequency of a flip flop is

Options :

1. ✗ 5MHz
2. ✗ 20MHz
3. ✓ 10MHz
4. ✗ 40MHz

Question Number : 31 Question Id : 1051315911 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In ECG analysis, QRS detection is important because it represents

Options :

1. ✖ Atrial depolarization
2. ✔ Ventricular depolarization
3. ✖ Ventricular repolarization
4. ✖ Atrial repolarization

Question Number : 32 Question Id : 1051315912 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The output voltage of a 6-bit ladder type DAC with a digital input of 111001 is
(Assume maximum output voltage is 10 V)

Options :

1. ✖ 9.04 V
2. ✖ 9.20 V
3. ✖ 9.06 V
4. ✔ 8.90 V

Question Number : 33 Question Id : 1051315913 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

An SAR type ADC and a Flash type ADC have identical resolution and reference voltage.
If both of them have same input signal bandwidth and sampling rate, then which of the following statements is true?

Options :

1. ✔ Flash ADC consumes comparators exponentially

2. ✖ SAR ADC has better DNL performance inherently
3. ✖ SAR ADC has lower conversion latency always
4. ✖ Flash ADC always has lower aperture jitter

Question Number : 34 Question Id : 1051315914 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Increasing the resolution of an ideal N-bit ADC at constant reference voltage will

Options :

1. ✖ Increase quantization noise power linearly
2. ✖ Decrease quantization noise power linearly
3. ✖ Not affect quantization noise power
4. ✔ Decrease quantization noise power exponentially

Question Number : 35 Question Id : 1051315915 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A 24 MHz microcontroller executes one instruction per clock cycle. If an interrupt service routine consumes 120 cycles, then the time taken by the ISR to execute is

Options :

1. ✖ 10 μ s
2. ✔ 5 μ s
3. ✖ 20 μ s
4. ✖ 1 μ s

Question Number : 36 Question Id : 1051315916 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In an 8-bit microcontroller, if the program counter is 16-bit wide, then the maximum addressable memory space is

Options :

1. ✓ 64 kB
2. ✗ 128 bytes
3. ✗ 1 MB
4. ✗ 256 bytes

Question Number : 37 Question Id : 1051315917 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following statements is true?

Options :

1. ✗ I/O-mapped I/O reduces instruction set size
2. ✗ I/O-mapped I/O increases addressable memory
3. ✓ Memory-mapped I/O allows use of all memory instructions
4. ✗ I/O-mapped I/O increases instruction set size

Question Number : 38 Question Id : 1051315918 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a 16k×8 microprocessor, the number of address and data lines respectively are

Options :

1. ✓ 14, 8
2. ✗ 16, 8

3. ✖ 8,16

4. ✖ 8,14

Question Number : 39 Question Id : 1051315919 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

CPU utilization in polling-based I/O is

Options :

1. ✖ Less than zero

2. ✔ Maximum

3. ✖ Zero

4. ✖ Independent of device speed

Question Number : 40 Question Id : 1051315920 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Signal conditioning is required mainly to

Options :

1. ✔ Match signal level to ADC input range

2. ✖ Increase sampling rate

3. ✖ Increase resolution

4. ✖ Reduce memory requirement

Question Number : 41 Question Id : 1051315921 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Accuracy in measurement relates to

Options :

1. ✓ Systematic error
2. ✗ Random error
3. ✗ Noise
4. ✗ Resolution

Question Number : 42 Question Id : 1051315922 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Q factor of a tuned amplifier does not depend on

Options :

1. ✗ Capacitance
2. ✓ Gain
3. ✗ Resistance
4. ✗ Inductance

Question Number : 43 Question Id : 1051315923 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is satisfied by a linear system?

Options :

1. ✗ Reciprocal property
2. ✗ Time invariance
3. ✗ Zero initial condition
4. ✓ Homogeneity

Question Number : 44 Question Id : 1051315924 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Transfer function is valid only for

Options :

1. ✓ Linear time-invariant systems
2. ✗ Linear time-variant systems
3. ✗ Non-linear time-invariant systems
4. ✗ Non-linear time-variant systems

Question Number : 45 Question Id : 1051315925 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following statements is true?

Options :

1. ✗ More zeros always improve transient response
2. ✗ Zero in right hand plane affects steady-state error
3. ✓ Improper systems are physically unrealizable
4. ✗ Stability depends on zeros

Question Number : 46 Question Id : 1051315926 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The spike-and-wave complex of the EEG is detected using

Options :

1. ✗ HPF

- 2. ✗ LPF
- 3. ✗ Wiener filter
- 4. ✓ Template Matching

Question Number : 47 Question Id : 1051315927 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The AZTEC algorithm converts the raw ECG sample points into

Options :

- 1. ✗ Slopes and segments
- 2. ✗ Segments and curves
- 3. ✗ Points and plateaus
- 4. ✓ Plateaus and slopes

Question Number : 48 Question Id : 1051315928 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In the most commonly used derivative-based QRS detection technique, the weighting factors for the first and second derivatives respectively are around

Options :

- 1. ✓ 1.3 and 1.1
- 2. ✗ 1.5 and 1.8
- 3. ✗ 1.5 and 0.8
- 4. ✗ 0.8 and 1.3

Question Number : 49 Question Id : 1051315929 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The adaptive filter used by Widrow to suppress the maternal ECG during fetal heart rate monitoring has following taps and a delay respectively

Options :

1. ✖ 16, 1s
2. ✖ 16, 100 ms
3. ✔ 2, 129 ms
4. ✖ 32, 1s

Question Number : 50 Question Id : 1051315930 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In sleep, K-complex occurs spontaneously or in response to

Options :

1. ✖ Very slowly changing stimulus
2. ✖ Very high stimulus
3. ✖ Very low stimulus
4. ✔ Sudden stimulus

Question Number : 51 Question Id : 1051315931 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The ST-segment analyzer measures

Options :

1. ✖ ST amplitude and ST frequency
2. ✔ ST slope and ST segment level

3. ✖ ST frequency and ST slope
4. ✖ ST segment level and ST frequency

Question Number : 52 Question Id : 1051315932 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The optimal Wiener filter can be designed if noise is a stationary random process that is statistically

Options :

1. ✔ Independent of the stationary signal
2. ✖ Dependent on the non-stationary signal
3. ✖ Independent of the non-stationary signal
4. ✖ Dependent on the stationary signal

Question Number : 53 Question Id : 1051315933 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Among the following which is not an ECG compression algorithm

Options :

1. ✖ AZTEC
2. ✖ CORTES
3. ✔ Pan- Tompkins
4. ✖ TPA

Question Number : 54 Question Id : 1051315934 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The sleep spindle is an episodic rhythm with

Options :

1. ✖ 30 Hz frequency and 50 mV amplitude
2. ✔ 14 Hz frequency and 50 μ V amplitude
3. ✖ 50 Hz frequency and 50 μ V amplitude
4. ✖ 60 Hz frequency and 50 mV amplitude

Question Number : 55 Question Id : 1051315935 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Integer filters are digital filters that use only integer coefficients for

Options :

1. ✔ Real-time processing speeds
2. ✖ Low processing speeds
3. ✖ Medium processing speeds
4. ✖ High processing speeds

Question Number : 56 Question Id : 1051315936 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Linear phase is easily achievable in

Options :

1. ✖ IIR filters
2. ✔ FIR filters
3. ✖ Analog filters
4. ✖ Band pass filters

Question Number : 57 Question Id : 1051315937 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Circular convolution occurs due to

Options :

1. ✓ DFT operation
2. ✗ Sampling theorem
3. ✗ Correlation
4. ✗ Infinite-length signals

Question Number : 58 Question Id : 1051315938 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A first-order system has transfer function $H(s) = \frac{1}{(s+2)}$. Its impulse response is

Options :

1. ✗ $2e^{-t}u(t)$
2. ✗ $2e^{-2t}u(t)$
3. ✓ $e^{-2t}u(t)$
4. ✗ $e^{-t}u(t)$

Question Number : 59 Question Id : 1051315939 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If ROC of a Laplace transform is $\text{Re}(s) > -2$, then the system is

Options :

1. ✖ Unstable
2. ✔ Causal
3. ✖ Stable
4. ✖ Anti-causal

Question Number : 60 Question Id : 1051315940 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Among the following, which signal is aperiodic?

Options :

1. ✖ $\cos(10t)$
2. ✖ $e^{j2\pi t}$
3. ✖ $\sin(4t + \pi)$
4. ✔ $e^{-2t}u(t)$

Question Number : 61 Question Id : 1051315941 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Thermistors are generally sintered mixtures of

Options :

1. ✖ Sulphides and oxalates of nickel, cobalt and manganese
2. ✔ Sulphides and oxides of nickel, cobalt and manganese
3. ✖ Oxalates and phosphates of nickel, cobalt and manganese
4. ✖ Phosphates and oxides of nickel, cobalt and manganese

Question Number : 62 Question Id : 1051315942 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The features of push-pull self-inductance transducer are

Options :

1. ✖ Immune to effects of external magnetic field and reduced mechanical input impedance
2. ✔ Immune to effects of external magnetic field and increased mechanical input impedance
3. ✖ Susceptible to effects of external magnetic field and reduced mechanical input impedance
4. ✖ Susceptible to effects of external magnetic field and increased mechanical input impedance

Question Number : 63 Question Id : 1051315943 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a capacitive transducer used for the measurement of angular displacements and angular vibrations, the capacitance of the transducer, when all teeth are aligned is

Options :

1. ✖ Directly proportional to gap between the teeth and inversely proportional to number of pairs of teeth
2. ✖ Directly proportional to number of pairs of teeth and inversely proportional to length of each tooth
3. ✖ Directly proportional to length of each tooth and inversely proportional to number of pairs of teeth
4. ✔ Directly proportional to length of each tooth and inversely proportional to gap between the teeth

Question Number : 64 Question Id : 1051315944 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Hall effect transducer is used as

Options :

1. ✖ Displacement transducer and position detector
2. ✖ Position detector and acceleration sensor
3. ✔ Displacement transducer, proximity detector and transducer for measuring magnetic fields
4. ✖ Displacement transducer, position detector and transducer for measuring electric fields

Question Number : 65 Question Id : 1051315945 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Among the following, torque is measured with

Options :

1. ✔ Cantilever-type bender bimorph
2. ✖ Parallel bimorph
3. ✖ Series bimorph
4. ✖ Piezoelectric strain multi morph

Question Number : 66 Question Id : 1051315946 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A differential amplifier has the following features

Options :

1. ✖ Susceptibility to common-mode signals, sensitivity to temperature, versatility
2. ✖ Immunity to common-mode signals, sensitivity to temperature, versatility
3. ✔ Insensitivity to temperature, high stability, versatility
4. ✖ Sensitivity to temperature, low stability, versatility

Question Number : 67 Question Id : 1051315947 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Typical amplitude of ECG signal is

Options :

1. ✖ 5 - 10 mV
2. ✔ 0.5 - 5 mV
3. ✖ 10 - 50 mV
4. ✖ 50 - 100 mV

Question Number : 68 Question Id : 1051315948 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

EMG signal amplitude mainly depends on

Options :

1. ✖ Respiration
2. ✔ Electrode placement and muscle activity
3. ✖ Blood pressure
4. ✖ Body temperature

Question Number : 69 Question Id : 1051315949 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In transformer coupling employed for protection against leakage currents, a carrier signal is employed with

Options :

1. ✔ Frequency or pulse width modulation

2. ✖ Amplitude modulation
3. ✖ Phase modulation
4. ✖ Pulse amplitude modulation

Question Number : 70 Question Id : 1051315950 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The amplitude of the ERG voltage is typically

Options :

1. ✖ 50 mV and is a function of the movement of the eye
2. ✖ 5 mV and is a function of the intensity of the light falling on the eye
3. ✔ 500 μ V and is a function of the intensity of the light falling on the eye
4. ✖ 50 μ V and is a function of the movement of the eye

Question Number : 71 Question Id : 1051315951 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

EEG alpha rhythm occurs in the frequency range

Options :

1. ✖ 0.5 - 4 Hz
2. ✔ 8 - 13 Hz
3. ✖ 4 - 7 Hz
4. ✖ 30 - 50 Hz

Question Number : 72 Question Id : 1051315952 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Power line interference affects the ECG signal recording and one way to minimize this interference is by

Options :

1. ✖ Shielding and grounding each lead at the ECG machine
2. ✖ Raising the skin-electrode impedances
3. ✔ Reducing the magnetic field strength in the vicinity of the ECG machine
4. ✖ Shielding the ECG machine

Question Number : 73 Question Id : 1051315953 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Among the voltage-limiting devices used to protect the electrocardiograph, the miniature neon lamps provide a break down voltage in the range of

Options :

1. ✖ 20-50 mV
2. ✖ 20-50 V
3. ✖ 5-9 V
4. ✔ 50-90 V

Question Number : 74 Question Id : 1051315954 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

As compared to those employed for ECG recording, the electrodes and the preamplifier for EEG recording must have

Options :

1. ✖ Lower contact impedance and higher input impedance respectively

2. ✖ Lower contact impedance and lower input impedance respectively
3. ✔ Higher source impedance and higher input impedance respectively
4. ✖ Higher source impedance and lower input impedance respectively

Question Number : 75 Question Id : 1051315955 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Surgical diathermy causes electromagnetic interference and in this process, the lead wires and the subject serve as

Options :

1. ✖ Out-of-band noise source
2. ✔ Antenna
3. ✖ Shielding
4. ✖ Other biopotential signal source

Question Number : 76 Question Id : 1051315956 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In the microtip fiber optic pressor sensor for in-vivo measurements, the characteristic curve between the sensor output and the membrane displacement is

Options :

1. ✔ Almost linear at very low displacements
2. ✖ Highly non-linear at very low displacements
3. ✖ Highly non-linear at all displacements
4. ✖ Linear at higher displacements

Question Number : 77 Question Id : 1051315957 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The most important features of thermocouples are

Options :

1. ✖ Fast response time, high sensitivity and small size
2. ✖ Long-term stability, high sensitivity and low output voltage
3. ✔ Low sensitivity, ease of fabrication and fast response time
4. ✖ Long-term stability, slow response time and difficulty in fabrication

Question Number : 78 Question Id : 1051315958 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The range of resistivity of thermistors which are used in medical applications, is

Options :

1. ✖ 1 and 20 Ω
2. ✔ 0.1 and 100 Ω
3. ✖ 50 and 1000 Ω
4. ✖ 0.5 and 1000 Ω

Question Number : 79 Question Id : 1051315959 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following statements is true with respect to the blood pressure measurement involving an occlusive cuff?

Options :

1. ✖ The length of the cuff is approximately 4 times the arm circumference
2. ✖ Positioning of the cuff does not matter if a shorter cuff is used

3. ✖ Longer cuff leads to misalignment
4. ✔ The width of the cuff is approximately 0.4 times the arm circumference

Question Number : 80 Question Id : 1051315960 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In the blood volume determination, the movement of the photoplethysmography relative to the tissue causes change in the

Options :

1. ✖ Baseline reflectance leading to sensor overload
2. ✔ Baseline transmittance leading to amplifier saturation
3. ✖ Baseline transmittance leading to sensor overload
4. ✖ Sensor sensitivity leading to amplifier saturation

Question Number : 81 Question Id : 1051315961 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following statement is false?

Options :

- Transformer voltage develops in electromagnetic flowmeters employing AC magnetic current with sine wave excitation
2. ✖ The best technique to minimize the transformer voltage effect is to employ quadrature suppression circuit
- Transformer voltage develops in electromagnetic flowmeters employing AC magnetic current with square wave excitation
3. ✖ In electromagnetic flowmeters employing AC magnetic current, square wave excitation is used to prevent the overload of the amplifier
4. ✔

Question Number : 82 Question Id : 1051315962 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In sine wave blood flowmeters, the signal-to-noise ratio is enhanced by employing

Options :

1. ✖ Low-noise FETs at amplifier output stage and half-wave demodulators
2. ✖ Full-wave demodulators and low-noise FETs at amplifier output stage
3. ✖ Half-wave demodulators and proper turns ratio for the step-down transformer
4. ✔ Low-noise FETs at amplifier input stage and full-wave demodulators

Question Number : 83 Question Id : 1051315963 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Arterial oxygen saturation at the forehead, chest and limbs can be measured with a

Options :

1. ✔ Transcutaneous reflectance oximeter
2. ✖ Percutaneous transmittance oximeter
3. ✖ Transcutaneous transmittance oximeter
4. ✖ Blood gas analyzer

Question Number : 84 Question Id : 1051315964 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In pulse oximetry, the light sources used are typically

Options :

1. ✖ Blue and green

2. ✖ Green and yellow
3. ✔ Red and infrared
4. ✖ Ultraviolet and visible

Question Number : 85 Question Id : 1051315965 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The energies required for defibrillation using implantable defibrillators and transthoracic defibrillators respectively are

Options :

1. ✖ 5 to 30 W and 50 to 100 W
2. ✔ 5 to 30 W-sec and 50 to 100 W-sec
3. ✖ 15 to 50 J and 500 to 1000 J
4. ✖ 15 to 30 W-sec and 150 to 1000 W-sec

Question Number : 86 Question Id : 1051315966 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In the human cell, the rough endoplasmic reticulum has ribosomes attached to its outer surface and the smooth endoplasmic reticulum manufactures and packages

Options :

1. ✖ DNA into vesicles
2. ✖ Hormones into vesicles
3. ✖ Glucose into vesicles
4. ✔ Lipids into vesicles

Question Number : 87 Question Id : 1051315967 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The four primary types of tissues in the human body are

Options :

1. ✓ Muscular, nervous, connective and epithelial
2. ✗ Adipose, nervous, connective and epithelial
3. ✗ Muscular, adipose, connective and epithelial
4. ✗ Muscular, interstitial, connective and epithelial

Question Number : 88 Question Id : 1051315968 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The electrical impulse generated by the SA node travels through the AV node, Purkinje fibers and ventricular muscle respectively at speeds of (in m/s)

Options :

1. ✗ 0.5, 2 and 1
2. ✗ 1, 0.3 and 2
3. ✓ 0.05, 3 and 0.5
4. ✗ 0.5, 1 and 2

Question Number : 89 Question Id : 1051315969 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

With reference to the nervous system, which of the following statements is false?

Options :

In a divergent circuit, each axonal branch of the presynaptic neuron connects with the

1. ✗ dendrite of a different postsynaptic neuron

In a convergent circuit, axons from several presynaptic neurons meet at the dendrite(s)

2. ✖ of a single postsynaptic neuron

A three-neuron circuit consists of a sensory neuron, an interneuron in the spinal cord,

3. ✖ and a motor neuron

4. ✔ Reflex arc is a special type of neural circuit with only 3 neurons

Question Number : 90 Question Id : 1051315970 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In the muscular system, which of the following statement is true?

Options :

1. ✖ The H zone and the area in which the actin and myosin overlap form the I band

2. ✔ The H zone and the area in which the actin and myosin overlap form the A band

3. ✖ The A band is the area in a relaxed muscle fiber that just contains actin filaments

4. ✖ The I band and the area in which the actin and myosin overlap form the A band

Question Number : 91 Question Id : 1051315971 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Under what type of loading and direction, the human cortical bone exhibits highest ultimate strength?

Options :

1. ✔ Compressive, longitudinal

2. ✖ Tensile, axial

3. ✖ Bending, longitudinal

4. ✖ Torsion, axial

Question Number : 92 Question Id : 1051315972 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

On application of tensile forces, cancellous bone exhibits a brittle behavior but yielding occurs under

Options :

1. ✖ Longitudinal bending
2. ✖ Transverse bending
3. ✔ Compressive loading
4. ✖ Torsion

Question Number : 93 Question Id : 1051315973 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In Poiseuille flow, the flow rate is directly proportional to

Options :

1. ✖ Length of the vessel, pressure, coefficient of viscosity
2. ✖ Pressure drop, length of the vessel, coefficient of viscosity
3. ✔ Pressure drop, diameter of the vessel
4. ✖ Pressure drop, length of the vessel

Question Number : 94 Question Id : 1051315974 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The percentage of body's blood volume that veins hold is

Options :

1. ✖ 40%

2. ✓ 60%

3. ✗ 50%

4. ✗ 30%

Question Number : 95 Question Id : 1051315975 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

As their aspect ratio is high, collagen fibers are not effective under

Options :

1. ✗ Axial tension

2. ✗ Transverse tension

3. ✗ Transverse compression

4. ✓ Axial compression

Question Number : 96 Question Id : 1051315976 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The ligament connects

Options :

1. ✗ Two muscles

2. ✓ Two bones

3. ✗ Muscle and bone

4. ✗ Bone and cartilage

Question Number : 97 Question Id : 1051315977 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Among the viscoelastic models

Options :

1. ✖ Voigt model behaves as a viscoelastic solid
2. ✖ Kelvin model behaves as a viscoelastic fluid
3. ✔ Maxwell model behaves as a viscoelastic fluid
4. ✖ Maxwell model behaves as a viscoelastic solid

Question Number : 98 Question Id : 1051315978 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Distance between corresponding successive points of heel contact of the opposite feet is termed step length and its mean value for a normal adult is around

Options :

1. ✔ 30 inches
2. ✖ 20 inches
3. ✖ 15 inches
4. ✖ 25 inches

Question Number : 99 Question Id : 1051315979 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is true with respect to the mobility of the joints?

Options :

1. ✖ Amphiarthrodial > Diarthrodial > Synarthrodial
2. ✖ Diarthrodial > Synarthrodial > Amphiarthrodial
3. ✖ Diarthrodial < Synarthrodial < Amphiarthrodial

4. ✓ Diarthrodial > Amphiarthrodial > Synarthrodial

Question Number : 100 Question Id : 1051315980 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

An agonist muscle causes movement through concentric contraction and an antagonist muscle controls the movement through

Options :

1. ✗ Concentric contraction
2. ✓ Eccentric contraction
3. ✗ Isovolumic contraction
4. ✗ Isometric contraction

Question Number : 101 Question Id : 1051315981 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

High efficiency in CT detectors results in

Options :

1. ✓ High dynamic range and minimum patient dose
2. ✗ Minimum patient dose and low dynamic range
3. ✗ High dynamic range and high patient dose
4. ✗ High contrast and low patient dose

Question Number : 102 Question Id : 1051315982 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Cardiac images obtained with conventional CT may not be precise due to

Options :

1. ✖ Limited number of detectors
2. ✖ Size of the detectors
3. ✖ Power line interference
4. ✔ Motion artifact

Question Number : 103 Question Id : 1051315983 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a PET scanner, the positron combines with

Options :

1. ✖ Neutron and emits one gamma ray
2. ✖ Electron and emits photon
3. ✖ Electron and emits high-energy photo
4. ✔ Electron and emits two gamma rays

Question Number : 104 Question Id : 1051315984 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In MRI system, longitudinal relaxation time is slower than

Options :

1. ✖ Phase relaxation time
2. ✖ Spin lattice relaxation time
3. ✔ Transverse relaxation time
4. ✖ De-phasing relaxation time

Question Number : 105 Question Id : 1051315985 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

CT imaging reconstructs cross-sectional images primarily using

Options :

1. ✖ Reflection of X-rays
2. ✔ Mathematical reconstruction from multiple projections
3. ✖ Magnetic resonance
4. ✖ Ultrasound echoes

Question Number : 106 Question Id : 1051315986 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The atomic number of the anode material in an X-ray tube is Z . If the X-ray tube has an anode-to-cathode voltage of V , the efficiency of X-ray production is

Options :

1. ✖ $\frac{Z}{V}$
2. ✖ ZV^2
3. ✖ $\frac{V^2}{Z}$
4. ✔ ZV

Question Number : 107 Question Id : 1051315987 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In an image intensifier, the factors contributing to brightness gain are

Options :

1. ✖ Electronic gain and voltage gain
2. ✖ Geometric gain and power gain
3. ✔ Electronic gain and geometric gain
4. ✖ Current gain and voltage gain

Question Number : 108 Question Id : 1051315988 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Acoustic impedance of a medium is defined as the product of

Options :

1. ✖ Density and wavelength
2. ✖ Pressure and velocity
3. ✔ Density and velocity of sound
4. ✖ Frequency and velocity

Question Number : 109 Question Id : 1051315989 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

With reference to Ultrasonography, the correct order of the materials/tissues with ascending values for the half value layer is

Options :

1. ✔ Bone, fat, water
2. ✖ Water, fat, bone
3. ✖ Water, fat, brain
4. ✖ Fat, muscle, brain

Question Number : 110 Question Id : 1051315990 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

SPECT systems are not suitable for dynamic studies because

Options :

1. ✖ They must enhance the variations in attenuation of the patient
2. ✔ They must compensate for variations in attenuation of the patient
3. ✖ They must enhance the attenuation coefficient of the patient which is a time-consuming process
4. ✖ They must compensate for variations in acoustic coefficient of the patient which is complex

Question Number : 111 Question Id : 1051315991 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In an ultrasonic transducer with radius 'R' and ultrasound wavelength ' λ ', the near field extends to a distance given by

Options :

1. ✔ $\left(\frac{R^2}{\lambda}\right) - \left(\frac{\lambda}{4}\right)$
2. ✖ $\left(\frac{R^2}{\lambda}\right) - \left(\frac{\lambda}{16}\right)$
3. ✖ $\left(\frac{2R^2}{\lambda}\right) - \left(\frac{\lambda}{16}\right)$
4. ✖ $\left(\frac{2R^2}{\lambda}\right) - \left(\frac{\lambda}{8}\right)$

Question Number : 112 Question Id : 1051315992 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Among the piezoelectric materials, PZT crystals show better electro-mechanical conversion efficiency than Quartz crystals upto a frequency of about

Options :

1. ✖ 15 MHz
2. ✖ 25 MHz
3. ✖ 25 kHz
4. ✔ 15 kHz

Question Number : 113 Question Id : 1051315993 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The correct combination of biomaterials and their medical applications are

Options :

1. ✖ Zirconia - Cochlear replacements, PVC - Intraocular lenses
2. ✖ Nylon - Artificial heart valves, Zirconia - Cochlear replacements
3. ✔ Cellulose - Drug delivery, PVC - Facial prostheses
4. ✖ Gold – Electrodes, PVC - Intraocular lenses

Question Number : 114 Question Id : 1051315994 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Metals are commonly used as biomaterials mainly because of their

Options :

1. ✔ High strength and toughness
2. ✖ High corrosion rate
3. ✖ Low density

4. ✖ Optical transparency

Question Number : 115 Question Id : 1051315995 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Carbonated apatite and brushite are the different atomic phases of calcium phosphate and they are

Options :

- 1. ✖ Polymeric biomaterials
- 2. ✖ Metallic biomaterials
- 3. ✔ Ceramic biomaterials
- 4. ✖ Composite biomaterials

Question Number : 116 Question Id : 1051315996 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For a compound, Agar diffusion test is used to evaluate

Options :

- 1. ✖ Mechanical strength
- 2. ✖ Thermal conductivity
- 3. ✖ Corrosion resistance
- 4. ✔ Cytotoxicity

Question Number : 117 Question Id : 1051315997 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The common characterization technique used to measure Young's modulus of a brittle biomaterial is

Options :

1. ✖ Compression test
2. ✖ Dynamic mechanical analysis
3. ✔ Three- and four-point bend test
4. ✖ Nano indentation test

Question Number : 118 Question Id : 1051315998 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

To produce high-resolution images, Transmission Electron Microscope uses a high-energy electron beam of typically

Options :

1. ✖ 5000 – 10000 V
2. ✔ 100 – 300 kV
3. ✖ 50 – 80 kV
4. ✖ 200 – 1000 kV

Question Number : 119 Question Id : 1051315999 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The capacity of a material to decompose naturally in a biological environment is biodegradability and it is brought by

Options :

1. ✖ Hormones and enzymes
2. ✖ Microorganisms and liver

3. ✖ Hormones and liver

4. ✔ Microorganisms and enzymes

**Question Number : 120 Question Id : 1051316000 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes**

Correct Marks : 1 Wrong Marks : 0

Which of the following is the first level of biocompatibility testing?

Options :

1. ✖ Secondary test

2. ✔ In vitro test

3. ✖ Clinical trial

4. ✖ Animal test