1) Given a sequence x(n) =[2 , 3, 4, 4] for $0 \leq n \leq 3$, Find Discrete Fourier Transform X(k) for $0 \leq k \leq 3$.

1) + X(k)=[13 , -2+j , -1 , -2-j]
2) - X(k)=[13 , -2-j , -1 , -2-j]
3) - X(k)=[13 , 2+j , 1 , -2+j]
4) - None of them

2) If x(n)={3, 4 ,7},h(n)={8 , 7 , 1 },$0 \leq n \leq 4$, the result of y(n)= x(n)*h(n) is

1) + Y(n)={ 24 , 53 , 87 , 53 , 7}
2) - Y(n)={ 24 , 53 , 81 , 53 , 7}
3) - Y(n)={ 24 , 53 , 87 , 53 , 1}
4) - Y(n)={ 21 , 53 , 87 , 53 , 7}

3) the following system y(n) = T[x(n)] = $3x(n^2)$

1) + the given system is linear and time-variant system
2) - the given system is nonlinear and invariant system
3) - the given system is linear and time-invariant system
4) - the given system is nonlinear and time-invariant system

4) Bioelectric signal is generate as an Action Potential (AP). This occurs when____
1) + Inside cell becomes positive and causes depolarization
2) - Inside cell becomes negative and causes depolarization
3) - Inside cell becomes positive and causes Repolarization
4) - Inside cell becomes negative and causes Repolarization

5) A signal has period T if ____
1) + x(t + T) = x(t) for all t
2) - x(t + T) = x(t) for t≥0
3) - x(t + T) = x(t) for t≤0

6) The unit-step function u(t), is defined as u(t)=1 when
1) + t≥0
2) - t≤0
3) - t<0
4) - t>0

7) from Fourier transform properties $X(w) = FX(t) = F\{X_1(w) * X_2(w)\}$=

1) + $X_1(w).X_2(w)$

2) - $X_1(t) * X_2(t)$

3) - $2\pi X_1(t).X_2(t)$

8)

Assuming that a 5-bit ADC channel accepts analog input ranging from 0 to 5 volts, determine the following:
1). number of quantization levels
2). the resolution of ADC
3) quantization error when the analog voltage is 4.5 volts
The answer is

1)   +   1) =32   2)=0.15   3)= 0.024

2)   -   1) =32   2)=0.15   3) =0.0024

3)   -   1) =32   2)=0.156   3) = 0.4

4)   -   1) =256   2)= 0.625   3) =4.1

9)   Form the signal in a figure determined the following:
1). Signal frequency F
2) Fourier coefficient C_0
3) Fourier coefficient C_1
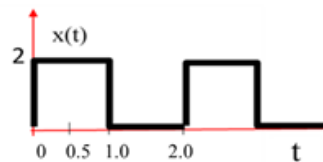
1)   +   1) =0.5   2) = 1   3)= $\frac{-j}{\pi}$

2)   -   1) =25   2) =2   3) = $\frac{j}{2\pi}$

3)   -   1) =2   2) =0.5   3) = $\frac{-j}{2\pi}$

4)   -   1) =0.5   2) =1   3) = $\frac{j}{\pi}$

10)   The frequency content of an analog ECG signal is 0.05–100 Hz. What is the lowest rate at which the signal can be sampled to produce an accurate digital signal?
1)   +   200 samples/second
2)   -   0.05 samples/second
3)   -   0.01 samples/second
4)   -   100 samples/second

11)   the following system y(n) = x(n - 1) +0.5y(n + 2)
1)   +   the given system is linear and causal system
2)   -   the given system is nonlinear and causal system
3)   -   the given system is linear and none causal system
4)   -   the given system is nonlinear and none causal system
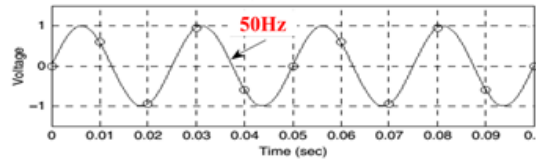
12)   The minimum to maximum values of the signal being measured.
1)   +   Range of operation
2)   -   Sensitivity
3)   -   Stability
4)   -   Signal to noise Ratio (SNR)

13)   the sampling interval,

1)   +   The time between samples.
2)   -   The time along the axis time of signal.
3)   -   The sampling numbers of a continuous signal.

14) **From the next figure, how many samples are enough to represent a continuous time signal?**

1)   +   120Hz
2)   -   80Hz
3)   -   50Hz
4)   -   90Hz

15) The sampling process can be described as a multiplication of the analog signal with a periodic impulse function.
1)   +   TRUE
2)   -   FALSE

16) The sampled signal spectrum is the sum of the shifted original spectrum and copies of its scaled versions, called replicas
1)   +   FALSE
2)   -   TRUE

17) The periodic signals can be analyzed in frequency domain with the help of
1)   +   All of them.
2)   -   Fourier series and Fourier transform.
3)   -   Fourier series expansion.
4)   -   Fourier transform

18) Which of the following tool is use for analyzing discrete signals in the frequency domain.
1)   +   Discrete Fourier transform and Z-transform.
2)   -   None of them.
3)   -   Z-transform.
4)   -   Fourier series expansion.

19) The Z-transform of discrete unit step function U(t) equal one
1)   +   FALSE
2)   -   TRUE

20) **Cheek if the signal x(t) $= cos(6\pi t) + sin(10\pi t)$ is a periodic function and determine the fundamental periods**

1)   +   (1/3)/(1/5)
2)   -   (1/6)/(1/10)
3)   -   (1/6)/(1/5)
4)   -   x(t - T) = x(t)

21) Geometrically, the graph of an even signal is anti-symmetric about the origin.
1)   +   False
2)   -   True

22) y(t) =x(t + 1), y is shifted to:
1)   +   the left by |-1|,(advanced in time)
2)   -   the right by |-1|, (delay in time)
3)   -   the right by -1, (advanced in time)

4)   -   the left by 1, (delay in time)

23)   The amplitude values of this signals cannot be predicted precisely called
1)   +   Random signals
2)   -   Transient signals
3)   -   Deterministic signals
4)   -   None of them

24)   **Determine whether signal are energy or power** $x(t) = e^{-2t}u(t),$

1)   +   The given signal is energy signal
2)   -   The given signal is power signal
3)   -   The energy value is infinite
4)   -   The average power is finite

25)   Time scaling maps the input x to the output y as given by y(t) = x(2t)
1)   +   The signal is compressed along the time
2)   -   The signal is expanded along the time axis
3)   -   The signal is neither expanded nor compressed.

26)   **the signal x(t) =2cos($\frac{2\pi}{6}$t) is**

1)   +   even
2)   -   neither even, or odd
3)   -   odd

27)   **Resulting spectrum of signal x(t)=$cos^2(4\pi t)$**

1)   + f_0=2Hz,w=4π

2)   - f_0=4Hz,w=4π

3)   - f_0=4Hz,w=2π

4)   - f_0=2Hz,w=2π

28)   **Shifting a signal in time** $F\{x_1(t - t_0)\}$ **corresponds to**

1)   + $e^{-jwt_0} X_1(w)$

2)   - $e^{jw_0t} X_1(t)$

3)   - $e^{-jw_0t} X_1(t)$

4)   - $e^{jwt_0} X_1(w)$

29)   **The Fourier transform of** $X(t)=5.\,e^{-\frac{t}{2}}.u(t)$ **is**

1)   + $\dfrac{5}{jw+1/2}$

2)   -

$$\frac{2}{jw+1/2}$$

3)   - $\dfrac{5}{jw-\frac{1}{2}}$

4)   - $\dfrac{2}{jw+1/5}$

30)   Anti-causal signals are signals
1)   +   that are zero for all positive time
2)   -   that are zero for all negative time
3)   -   that have nonzero values in both positive and negative time

31)   To generate the sequence numbers of signal {x[n]}, we use the recursive equation: x[n] = x[n − 1] + x[n − 2]
     n ≥ 2 where x[0] = 1 , x[1] = 2 Find the sequence of signal x[n],
1)   +   None of them
2)   -   x[2] = 3, x[3] = 5, x[4] = 7
3)   -   x[2] = 3, x[3] = 3, x[4] = 5
4)   -   x[2] = 3, x[3] = 3, x[4] = 8

32)   The acquisition of the values of a continuous-time signal at discrete points in time.
1)   +   Sampling
2)   -   Quantization
3)   -   Encoding

33)   **The sampled signal spectrum of the analog signal x(t)=6cos(200πt) for, t ≥ 0 at minimum sampling rate, is obtained by using next equation**

1)   + $X_s(f) = \dfrac{3}{T} \sum\limits_{n=-\infty}^{\infty} X(100 \pm n200)$

2)   - $X_s(f) = \dfrac{2.5}{T} \sum\limits_{n=-\infty}^{\infty} X(100 \pm n200)$

3)   - $X_s(f) = \dfrac{3}{T} \sum\limits_{n=-\infty}^{\infty} X(1 \pm 2n)$

4)   - $X_s(f) = \dfrac{6}{T} \sum\limits_{n=-\infty}^{\infty} X(100 \pm n200)$