SIGNALS AND SYSTEMS

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1. Which of the following is done to convert a continuous time signal into discrete time signal?

a) Modulating

b) Sampling

c) Differentiating

d) Integrating

Answer: b

2. The deflection voltage of an oscilloscope is a 'deterministic' signal.

a) True

3. The even part of a signal x(t) is?

a) x(t)+x(-t)

b) x(t)-x(-t)

c) (1/2)*(x(t)+x(-t))

d) (1/2)*(x(t)-x(-t))

Answer: c

4. Which of the following is the odd component of the signal x(t)=e(jt)?

a) cost

b) j*sint

c) j*cost

d) sint

Answer: b

5. For a continuous time signal x(t) to be periodic with a period T, then x(t+mT) should be equal to _____

a) x(-t)

b) x(mT)

c) x(mt)

d) x(t)

Answer: d

6. Let x1(t) and x2(t) be periodic signals with fundamental periods T1 and T2 respectively. Which of the following must be a rational number for x(t)=x1(t)+x2(t) to be periodic?

a) T1+T2

b) T1-T2

c) T1/T2

d) T1*T2

Answer: c

7. Let x1(t) and x2(t) be periodic signals with fundamental periods T1 and T2 respectively. Then the fundamental period of x(t)=x1(t)+x2(t) is?

a) LCM of T1 and T2 b) HCF of T1and T2

c) Product of T1 and T2

d) Ratio of T1 to T2

Answer: a

Explanation: For the sum of x1(t) and x2(t) to be periodic the ratio of their periods should be a rational number, then the fundamental period is the LCM of T1 and T2.

8. All energy signals will have an average power of _____

a) Infinite

b) Zero

c) Positive

d) Cannot be calculated

Answer: b

9. x(t) or x(n) is defined to be an energy signal, if and only if the total energy content of the signal is a _____

a) Finite quantity

b) Infinite

c) Zero

d) None of the mentioned

Answer: a

Explanation: The energy signal should have a total energy value that lies between 0 and

infinity.

10. What is the period of cos2t+sin3t?

a) pi

b) 2*pi

c) 3*pi

d) 4*pi

Answer: b

Explanation: Period of cos2t=(2*pi)/2=pi

Period of sin3t=(2*pi)/3

1. Which of the following is common independent variable for speech signal, EEG and ECG?

a) Time

b) Spatial coordinates

c) Pressure

d) None of the mentioned

View Answer

Answer: a

Explanation: Speech, EEG and ECG signals are the examples of information-bearing signals

that evolve as functions of a single independent variable, namely, time.

2. Which of the following conditions made digital signal processing more advantageous over

analog signal processing?

a) Flexibility

b) Accuracy

c) Storage

d) All of the mentioned

View Answer

Answer: d

Explanation: Digital programmable system allows flexibility in reconfiguring the DSP

operations by just changing the program, as the digital signal is in the form of 1 and 0's it is

more accurate and it can be stored in magnetic tapes.

3. Which property does y(t)=x(1-t) exhibit?

a) Time scaling

b) Time shifting

c) Reflecting

d) Time shifting and reflecting

View Answer

Answer: d

Explanation: First the signal x(t) is shifted by 1 to get x(1+t) and it is reflected to get x(1-t).

So, it exhibits both time shifting and reflecting properties.

4. If x(n)=(0,1,2,3,3,0,0,0) then x(2n) is?

a) (0,2,4,6,6,0,0,0)

b) (0,1,2,3,3,0,0,0)

c) (0,2,3,0,0,0,0,0)

d) None of the mentioned

View Answer

Answer: c

Explanation: Substitute n=0,1,2… in x(2n) and obtain the values from the given x(n).

5. If x(n)=(0,0,1,2,3,4,0,0) then x(n-2) is?

a) (0,0,2,4,6,8,0,0)

b) (0,0,1,2,3,4,0,0)

c) (1,2,3,4,0,0,0,0)

d) (0,0,0,0,1,2,3,4)

View Answer

Answer: d

Explanation: The signal x(n) is shifted right by 2.

6. If x(n)=(0,0,1,1,1,1,1,0) then x(3n+1) is?

a) (0,1,0,0,0,0,0,0)

b) (0,0,1,1,1,1,0,0)

c) (1,1,0,0,0,0,0,0)d) None of the mentioned

View Answer

Answer: a

Explanation: First shift the given signal left by 1 and then time scale the obtained signal by 3.

7. If a signal x(t) is processed through a system to obtain the signal (x(t)2

), then the system is

said to be _____

a) Linear

b) Non-linear

c) Exponential

d) None of the mentioned

View Answer

Answer: b

Explanation: Let the input signal be 't'. Then the output signal after passing through the

system is y=t2 which is the equation of a parabola. So, the system is non-linear.

1. What is single-valued function?

a) Single value for all instants of time

b) Unique value for every instant of time

c) A single pattern is followed by after 't' intervals

d) Different pattern of values is followed by after 't' intervals of time

View Answer

Answer: b

Explanation: Single-valued function means "for every instant of time there exists unique

value of the function".

2. In real valued function and complex valued function, time is _____

a) Real

b) Complex

c) Imaginary

d) Not predictable

View Answer

Answer: a

Explanation: Time is an independent variable and it is real valued irrespective of real valued

or complex valued function. And time is always real.

3. Discrete time signal is derived from continuous time signal by _____ process.

a) Addition

b) Multiplying

c) Sampling

d) Addition and multiplication

View AnswerAnswer: c

Explanation: Sampling is a process wherein continuous time signal is converted to its

equivalent discrete time signal. It is given by t = N*t.

4. Even signals are symmetric about the vertical axis.

a) True

b) False

View Answer

Answer: a

Explanation: Signals are classified as even if it has symmetry about its vertical axis. It is given

by the equation x (-t) = x (t).

5. If x (-t) = -x (t) then the signal is said to be _____

a) Even signal

b) Odd signal

c) Periodic signal

d) Non periodic signal

View Answer

Answer: a

Explanation: Signals is said to be odd if it is anti- symmetry over the time origin. And it is

given by the equation x (-t) = -x (t).

6. Which of the following is true for complex-valued function?

a) X (-t) = x*(t)

b) X (-t) = x(t)

c) X (-t) = − x(t)

d) X (-t) = x*(-t)

View Answer

Answer: a

Explanation: Complex-valued function is said to be conjugate symmetry if its real part is even and imaginary part is odd and it is shown by the equation x(-t) = x*(t).

7. When x(t) is said to be non periodic signal?

a) If the equation x (t) = x (t + T) is satisfied for all values of T

b) If the equation x (t) = x (t + T) is satisfied for only one value of T

c) If the equation x (t) = x (t + T) is satisfied for no values of T

d) If the equation x (t) = x (t + T) is satisfied for only odd values of T

View Answer

Answer: c

Explanation: A signal x (t) is said to be non periodic signal if it does not satisfy the equation x(t) = x(t + T). And it is periodic if it satisfies the equation for all values of T = T0, 2T0, 3T0…

8. Fundamental frequency x[n] is given by _____

a) Omega = 2*pi /Nb) Omega = 2*pi*N

c) Omega = 4*pi *2N

d) Omega = pi / N

View Answer

Answer: a

Explanation: Fundamental frequency is the smallest value of N which satisfies the equation Omega = 2*pi/ N, Where N is a positive integer.

9. Noise generated by an amplifier of radio is an example for?

a) Discrete signal

b) Deterministic signal

c) Random signal

d) Periodic signal

View Answer

Answer: c

Explanation: Random signal is the one which there is uncertainty before its actual occurrence. Noise is a best example for random signal.

10. Energy signal has zero average power and power signal has zero energy.

a) True

b) False

View Answer

Answer: b

Explanation: Energy and power signals are mutually exclusive. Energy signal has zero average

power and power signal has infinite energy.

11. What is the fundamental frequency of discrete –time wave shown in fig a?

a) π/6

b) π/3

c) 2π/8

d) π

View Answer

Answer: b

Explanation: Omega = 2* π / N. In the given example the number of samples in one period is N = 6. By substituting the value of N =6 in the above equation then we get fundamental

frequency as π/3.

12. Calculate the average power of the discrete-time wave shown in fig a?

a) 1

b) 6

c) 0

d) -1

View Answer

Answer: a

Explanation: The given formula is used to calculate average power

for Periodic -discrete signal. By substituting the value of N and x2[n] in the given then we get

the required answer.

13. What is the total energy of rectangular pulse shown in fig b?

a) $8A^2$

b) $4A$

c) $2A$

d) $4A^2$

View Answer

Answer: a

Explanation: The total energy of the rectangular pulse can be found by

integrating the square of the signal. Basically energy is given by area under the curve.

14. What is the total power of the rectangular pulse shown in fig b?

a) 0

b) $8A^2$

c) ∞

d) $2A$

View Answer: a

Explanation: Energy signals have zero power and finite energy. Figure b is an example of an

energy signal. This is one of the definition/ properties of the energy signal.

15. What is the total energy of the signal shown in fig c?

a) 6

b) 0

c) 3

d) 1

View Answer

Answer: a

Explanation: The given figure is an example of an energy signal hence the energy of a

discrete-time signal is given by the equation $E = \sum x^2$

[n].

1. Which of the following is an example of amplitude scaling?

a) Electronic amplifier

b) Electronic attenuator

c) Both amplifier and attenuator

d) Adder

View Answer

Answer: c

Explanation: Amplitude scaling refers to multiplication of a constant with the given signal.

It is given by y (t) = a x (t). It can be both increase in amplitude or decrease in amplitude.

2. Resistor performs amplitude scaling when x (t) is voltage, a is resistance and y (t) is output

current.

a) True

b) False

View Answer

Answer: b

Explanation: The given statement is not true. The relation between voltage, current and

resistance is given by V = IR. Comparing with equation y (t) = a x (t), we can see that y (t) is

the output voltage for given current x (t) with resistance R.

3. Which of the following is an example of physical device which adds the signals?

a) Radio

b) Audio mixerc) Frequency divider

d) Subtractor

View Answer

Answer: b

Explanation: Audio mixer is a device which combines music and voice signals. It is given by

Y (t) = x1 (t) + x2 (t).

4. AM radio signal is an example for _____

a) y (t) = a x (t)

b) y (t) = x1 (t) + x2 (t)

c) y (t) = x1 (t) * x2 (t)

d) y (t) = -x(t)

View Answer

Answer: c

Explanation: AM radio signal is an example for y (t) = x1 (t) * x2 (t) where, x1 (t) consists of an audio signal plus a dc component and x2 (t) is a sinusoidal signal called carrier wave.

5. Which of the passive component performs differentiation operation?

a) Resistor

b) Capacitor

c) Inductor

d) Amplifier

View Answer

Answer: c

Explanation: Inductor performs differentiation. It is given by y (t) = L d/dt i(t) where, I (t) denotes current flowing through an inductor of inductance L.

6. Which of the component performs integration operation?

a) Resistor

d) Diode

c) Capacitor

d) Inductor

View Answer

Answer: c

Explanation: Capacitor performs integration. V (t) developed across capacitor is given by

v (t) = (1/C)* ∫t

-∞ i (∂).d∂, I (t) is the current flowing through a capacitor of capacitance C.

7. Time scaling is an operation performed on _____

a) Dependent variable

b) Independent variable

c) Both dependent and independent variable

d) Neither dependent nor independent variable

View AnswerAnswer: b

Explanation: Time scaling is an example for operations performed on independent variable

time.

It is given by y (t) = x (at).

8. Y (t) = x (2t) is _____

a) Compressed signal

b) Expanded signal

c) Shifted signal

d) Amplitude scaled signal by a factor of 2

View Answer

Answer: a

Explanation: By comparing the given equation with y (t) = x (at) we get a=2. If a>1 then it is

compressed version of x (t).

9. Y (t) = x (t/5) is _____

a) Compressed signal

b) Expanded signal

c) Time shifted signal

d) Amplitude scaled signal by factor 1/5

View Answer

Answer: b

Explanation: y (t) = x (at), comparing this with the given expression we get a = 1/5. If 0<a<1

then it is expanded (stretched) version of x (t).

10. In discrete signal, if y [n] = x [k*n] and k>1 then _____

a) Some samples are lost from x [n]

b) Some samples are added to x [n]

c) It has no effect on samples

d) Samples will be increased with factor k

View Answer

Answer: a

Explanation: For discrete time signal y [n] = x [k*n] and k>1, it will be compressed signal and some samples will be lost. The samples lost will not violate the rules of sampling theorem. This set of Signals & Systems Interview Questions and Answers for freshers focuses on "Basic Explanation: Y (t) = -3*x (t) is an example for amplitude scaling. Here amplitude is scaled by a factor -3.

3. In the following diagram, X [n] and y [n] are related by _____ a) Y [n] = 2*x [n]

b) Y [n] = -2*x [n]

c) Y [n] = x [2n]

d) Y [n] = x [-2n]

View Answer

Answer: a

Explanation: Y [n] = 2*x [n] is an example for amplitude scaling of discrete time signal. The given figure is an example for 2*x [n] hence Y [n] = 2*x [n] is correct.

4. X [n] and y [n] is as shown below, the relationship between x [n] and y [n] is given by _____

a) X [n] = y [n]/3

b) X [n] = 3* y [n]

c) Y [n] = x [n]/3

d) Y [n] = 3*x [n]

View Answer

Answer: c

Explanation: The given y [n] is amplitude scaling of a discrete time signal by a factor 1/3.

Explanation: X [2n] is an example of time scaling. For discrete time signal x [k*n], k>1 the

samples will be lost.

6. Considering figure 3 above, is the following figure true for y [n] = x [n/2]?

a) True

b) False

View Answer

Answer: b

Explanation: X [n/2] is an example for time scaling by factor ½ and it will be a stretched

signal.

The discrete time signal should extend from -10 to 10.7. Consider figure 4, is the given y (t) an integration of x (t)?

a) Y (t) = ∫x (t).dt

b) Y (t) = ∫x2

(t).dt

c) Y (t) = 3* ∫x (t).dt

d) Y (t) = 3* ∫x2

(t).dt

View Answer

Answer: a

Explanation: The given y (t) is integral of x (t) and amplitude 3 remains constant for t>1.

It is because of the properties of integration.

9. The given pair x (t) and y (t) is _____

a) Y (t) = d/dt (x (t))

b) Y (t) = ∫x (t).dt

c) Y (t) = x (t) -1d) Y (t) = x (t) /2

View Answer

Answer: a

Explanation: The given pair x (t) and y (t) is related by y (t) = d/dt (x (t)). From -2 to 2 we have

Y (t) is zero because differentiation of constant is zero.

10. The given pair x (t) and y (t) is related by _____

a) Y (t) = d/dt (x (t))

b) Y (t) = x (t) + 1

c) Y (t) = ∫x (t) .dt

d) Not related

View Answer

Answer: c

Explanation: The given pair x (t) and y (t) is related by Y (t) = ∫x (t) .dt. The integral of x (t) gives the Y (t). Y (t) = 0 for t > 1.

1. The general form of real exponential signal is_____

a) X (t) = beat

b) X (t) = (b+1)eat

c) X (t) = b (at)

d) X (t) = be (a+1)t

View Answer

Answer: a

Explanation: X (t) = beat is the most general way of representing the exponential signals where both b and a are real parameters.

2. In the equation x (t) = beat if a < 0, then it is called _____

a) Growing exponential

b) Decaying exponential

c) Complex exponential

d) Both Growing and Decaying exponential

View AnswerAnswer: b

Explanation: If a > 0 in x (t) = beat it is called growing exponential and if <0 it is called decaying exponential. Hence Decaying exponential is correct.

3. In the below figure if R value is increased then which of the following is true?

a) Slower the rate of decay of v (t)

b) Greater the rate of decay of v (t)

c) Decay rate is independent of R

d) Decay rate depends only on the capacitor value

View Answer

Answer: a

Explanation: In the circuit shown voltage across capacitor decays exponentially with time at a rate determined by time constant RC. Hence the larger the resistor, the slower will be the rate of decay of v (t) with time.

4. The time period of continuous-time sinusoidal signal is given by _____

a) T = 2π / w

b) T = 2π / 3w

c) T = π / w

d) T = π / 2w

View Answer

Answer: a

Explanation: X (t) = A cos (wt+φ) is the continuous-time sinusoidal signal and its period is given by

T = 2π / w where w is the frequency in radians per second.

√LC where, L is value of inductor and C is value of capacitor.6. X [n] = 2 cos (2n) is periodic or not?

a) Periodic with period 2n

b) Periodic with period 2π

c) Periodic with period 2

d) Non periodic

View Answer

Answer: d

Explanation: The given signal x [n] is non periodic as it doesn't satisfy the equation

w=2πm∕N where, N is fundamental period and m is an integer.

7. Check whether x [n] = 7 sin (6πn) is periodic and if it is period calculate its fundamental period?

a) Periodic with fundamental period 6π

b) Periodic with fundamental period 3

c) Periodic with fundamental period 1

d) Non periodic

View Answer

Answer: c

Explanation: X [n] = 7 sin (6πn) is a periodic discrete time signal with period 1. By substituting w = 6π and m=3 in w=2πm∕N we get N =1.

8. Find the smallest angular frequency for which the discrete time signal with fundamental period N=8 would be periodic?

a) π∕4

b) π

∕2

c) 3π∕4

d) π

∕16

View Answer

Answer: a

Explanation: By substituting N=8 and m=1 in the equation w=2πm∕N we get the smallest angular frequency as π∕4.

9. Euler's identity ejθ is expanded as _____

a) cos θ + j sin θ

b) cos θ – j sin θ

c) cos θ + j sin 2θ

d) cos 2θ+j sinθ

View Answer

Answer: a

Explanation: The complex exponential ejθ is expanded as cos θ + j sin θ and is called Euler's

1. Mathematical representation of given rectangular pulse is _____

a) X (t) = {2A, t/2 < 0 < -t/2

b) X (t) = {2A, -t/2 < 0 < t/2

c) X (t) = {2A, 0 <= |t| <= t/2

{0, |t| > t/2

d) X (t) = {2A, 0 <|t| < t/2

{0, |t| > t/2

View Answer

Answer: c

Explanation: The given rectangular pulse is of amplitude 2A for the time interval –t/2 to t/2 and zero otherwise.

2. If describe x [n] as superposition of two step functions.

a) X [n] = u [n] – u [n-5].

b) X [n] = u [n] + u [n-5].

c) X [n] = u [n-5] – u [n].

d) X [n] = u [n-5] + u [n].

View Answer

Answer: a

Explanation: X [n] will be of amplitude for the interval 0 to 4 and zero otherwise. It can be

5. The step function u (t) is integral of _____ with respect to time t.

a) Ramp function

b) Impulse function

c) Sinusoidal function

d) Exponential function

View Answer

Answer: b

Explanation: Step function is an integral of impulse function and conversely, impulse is the derivative of step function u (t).

6. The area under the pulse defines _____ of the impulse.

a) Strength

b) Energy

c) Powerd) Duration

View Answer

Answer: a

Explanation: The area under the pulse defines strength of the impulse and the strength of the impulse is denoted by the label next to the arrow.

7. Unit impulse ∂(t) is _____ of time t.

a) Odd function

b) Even function

c) Neither even nor odd function

d) Odd function of even amplitude

View Answer

Answer: b

Explanation: For an impulse function, ∂(-t)= ∂(t). Hence unit impulse is an even function of time t.

9. ∂(at) = 1∕a ∂(t), this property of unit impulse is called _____

a) Time shifting property

b) Time scaling property

c) Amplitude scaling property

d) Time reversal property

View Answer

Answer: b

Explanation: Impulse function exhibits shifting property, time scaling property. And time scaling property is given by∂(at) = 1

∕a ∂(t).

10. Which of the following is not true about the ramp function?

a)b) r (t) = t u (t)

c) Ramp function with unit slope is integral of unit step

d) Integral of unit step is a ramp function of unit slope

View Answer

Answer: d

Explanation: The impulse function is derivative of the step function. In the same way the integral of step function is a ramp function of unit slope.

∫u(t) = r(t).

1. Is the system y(t) = Rx(t), where R is a arbitrary constant, a memoryless system?

a) Yes

b) No

View Answer

Answer: a

Explanation: The output of the system depends on the input of the system at the same time instant. Hence, the system has to be memoryless.

2. Does the following discrete system have the parameter of memory, y[n] = x[n-1] + x[n] ?

a) Yes

b) No

View Answer

Answer: a

Explanation: y[n] depends upon x[n-1], i.e at the earlier time instant, thus forcing the system to have memory.

3. y[t]= ∫x[t],t ranges from 0 to t. Is the system a memoryless one?

a) Yes

b) No

c) Both memoryless and having memory

d) None of the Mentioned

View Answer

Answer: b.

4. y(t) = sin(x(t-1)) : Comment on its memory aspects.

a) Having memory

b) Needn't have memory

c) Memoryless system

d) Time invariant system

View AnswerAnswer: a

Explanation: The output at any time t = A, requires knowing the input at an earlier time, t = A

– 1, hence making the system require memory aspects.

5. Construct the inverse system of y(t) = 2x(t)

a) y(t) = 0.5x(t)

b) y(t) = 2x(t)

c) y(2t) = x(t)

d) y(t) = x(2t)

View Answer

Answer: a

Explanation: Now, y(t) = 2x(t) => x(t) = 0.5*y(t)

Thus, reversing x(t) <-> y(t), we obtain the inverse system: y(t) = 0.5x(t)

6. y(t) = x2(t). Is y(t) = sqrt(x(t)) the inverse of the first system?

a) Yes

b) No

c) Inverse doesn't exist

d) Inverse exist

View Answer

Answer: b

Explanation: We cannot determine the sign of the input from the second function, thus, the

output doesn't replicate the input. Thus, the second function is not an inverse of the first

one.

7. Comment on the causality of y[n] = x[-n].

a) Time invariant

b) Causal

c) Non causal

d) Time varying

View Answer

Answer: c

Explanation: For positive time, the system may seem to be causal. However, for negative time, the output depends on time at a positive sign, thus being in the future, enforcing non causality.

8. y(t) = x(t-2) + x(2-t). Comment on its causality:

a) Causal

b) Time variant

c) Non causal

d) All of the mentioned

View Answer Answer: c

Explanation: For a time instant existing between 0 and 1, it would depend on the input at a time in the future as well, hence being non causal.

9. Comment on the causality of y[n] = n*x[n].

a) Time invariant

b) Time varying

c) Non causal

d) Causal

View Answer

Answer: d

Explanation: For positive time, the system may seem to be causal. For negative time, the output depends on the same time instant, thus making it causal.

10. Comment on the linearity of y[n] = n*x[n].

a) Linear

b) Only additive

c) Not scalable

d) Non linear

View Answer

Answer: d

Explanation: The function obeys the scaling/homogeneity property, but doesn't obey the

additivity property, thus not being

1. **The impulse response of a continuous time LTI system is** $h(t) = \left[2e^{-2t} - e^{(t-100)}\right] u(t)$. **The system is:**

Causal but not stable

2. **A time invariant system is a system whose output :**

Decreases with a delay in input

3. **The fundamental frequency of the signal** $g\ (t) = 10 sin(24\ pi\ t) + 4 cos(32\ pi\ t)$ **:**

4

4. **The energy of the following signal is :**
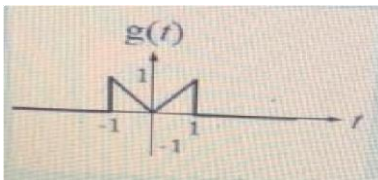
None of the given options (the options is: 1/2 , 1/3 , 2/3)

5. **The stability of a system is defined as:**

A system is stable, if a bounded input gives a bounded output, for all values of the input

6. **The convolution of rect function of width w with itself produces :**

Tri function with width of 2w

7. **The following DT system is:**
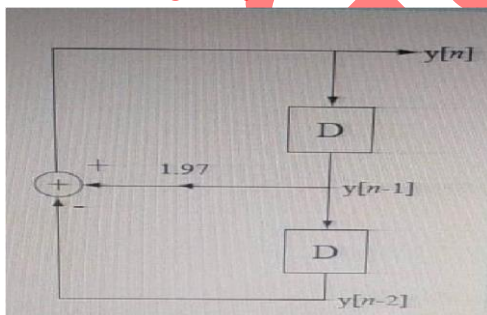
Discrete time with feedback system

8. **The integration of the unit step function is a unit impulse function . False**

9. **Expanding the signal g(t) horizontally by the factor a is :**

Time shift

10. **The periodic signal x[n] over the interval 7 is always periodic also over the interval 3.5 :**

False

11. **Some signals are even, some are odd and some are neither even or odd. But some functions can not be written as the sum of even and odd parts :**

False

12. **An odd signal g(t) does not change if we do the following :**

Time reversal (reflect) and then amplitude reversal (reflect)

13. **Determine the fundamental period of the following signal: sin (60 pi t)**

1/30 sec

14. **The fundamental period of the signal x[n] = 4cos(72 pi n/17) is :**

17

15. **Sum of two periodic signals is a periodic signal when the ratio of their time periods is :**

A rational number

16. **Comment on the linearity of y[n] = n*x[n].**

Linear

17. **If $g\,(t) = 9\,rect\left(\frac{t}{2} - 4\right) * \delta(3t)$, g(8) is equal to: 3**

18. **Find the value of $h[n] * \delta[n-1]$, where δ [n] is the unit delta function :**

h[n-1]

19. **The value of the signal g[n]= h[n] * h[n] at n=2 is:**
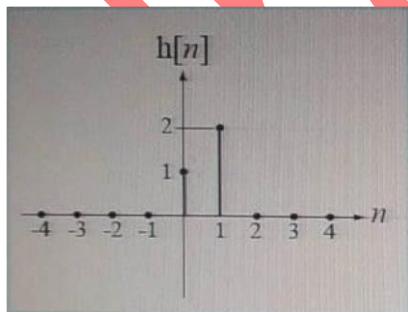
4

20. **The signal rect(t) , cos(t) is:**

Energy signal

21. **For a continuous-time LTI system, if the real part of all of the eigenvalues is less than zero, the system is:**

BIBO stable

22. The values of the function g[n] = x[n] *x[n] at n=-1 is :
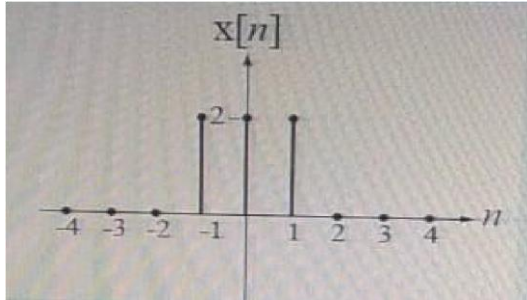
8

23. A LTI system with the following impulse response h(t) is:
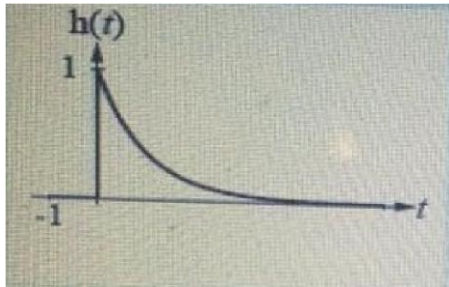
None of the mentioned. (the options: non-causal , memory-less , unstable.)

24. Convolution is considered in case of :

In both continuous time and discrete time systems

25. If the impulse response of LTI system is u(t-1), then the response of this system to the u(t) is:

ramp(t)

26. For the system $y(t) = x^2(t)$, the following is true :

Non-Invertible

27. The derivative of a function at any time t is its accumulated area under the function up to that time.
False

28. The first backward difference of the unit sequence signal is the:

The unit impulse signal

29. If h1, h2 and h3 are cascaded, the overall impulse response is:

h1 *h2*h3

30. X(t)*h(t) is :

h(t)*x(t)

31. The periodic signal x[n] over the interval 7 is always periodic also over the interval 3.5

False

32. The signal ((t-2)/3) is sketched by doing the following on g(t) :

Expand by 3 then shift to right by 2

33. Time compression for DT signal is irreversible .

True

34. One of the following is a periodic DT signal x[n]:

Sin[2 pi n / 17]

35. Find the value of h[n] * δ [n-1], where $\delta[n]$ is the unit delta function:

h[n-1]

36. e^{jt} signal is called : complex sinusoidal

37. One of the following is a periodic discrete time signal x[n] : Sin [2 pi n/17]

38. Which one of the following is an example of a bounded signal :
  $e^{-t}cos(wt)$

39. The discrete-time unit-impulse function is not the same like any other DT signal . False

40. The signal x(t) = exp(-t)* sin (t) is :

  Aperiodic

41. What is a unit impulse response ?
  The output of an LTI system due to a unit impulse signal

42. If $g\ (t) = 9\ rect(\frac{t}{2} - 4) * \delta(3t)$, g(8) is equal to :
  0

43. If the system is homogeneous then it is :
  None of the given options .

44. What is the even component of a discrete time signal ? X[n]= (x[n]-x[-n])/2.

45. The impulse response of a system is the output of the system when the input to that system is: $\delta\ (t)$

46. If g(t)= cos(t) and x(t) = sin (t) ,then the integration of x(t) .g(t) over the time - infinity to infinity is :
    Zero

47. For the signal x(t) =a −b* exp(-ct). What is the steady state value and the initial value ?
    a , a-b

48. For what value of k, will the following system be time invariant ? y(t) = x(t)-x(k t)-x(2t)+x(t-1) 2

49. The following equation is linear, constant-coefficient, homogeneous ordinary differential equation.
    $my\acute{o}(t) = Ks\ y\ (t) = mg + 30ks$
    False

50. It is enough to decide that the system is not linear if it is known that it is not homogeneous . True

51. The discrete time signal may not be periodic :
    True

52. Expanding the signal g(t) horizontally by the factor a is :
    Time shift

53. Determine the odd component of the signal x(t) = cos(t)+ sin(t) :
    Sin(t)

54. y[n] - y[n-7] = x[n]* (h[n+7]-h[n])
    False

55. A system which is linear is said to obey the rules of :
    Both homogeneous and additivity

56. H1,h2 and h3 are parallelly summed the overall impulse response is :
    h1+h2+h3

57. The real part of the complex signal Az^n is given as :
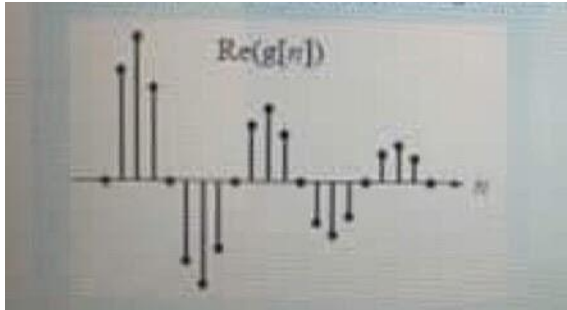
The value of z is

|z| =1

58. The value of the following is

$$\int_0^4 \delta_3(2t-1)\,dt$$

1.5

59. The first backward difference of x[n] is g[n] shown bellow, the value of x[5] is:
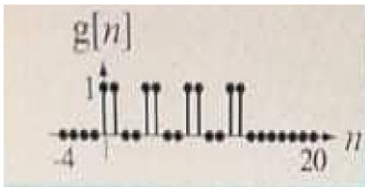
4

60. The forward and backward difference of a signal give the same result.

False

61. The following signal is periodic: g(t) = 3sin(5t) + 4sin($\sqrt{2}$ t)

False

62. We have to do the following steps in order on g(t) to sketch g(2t-1):

Shift by 1 to the right, then time compress by 2

63. If the backward difference of the signal f[n] is given by
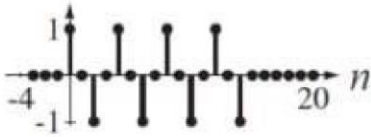
   Then, f[4]:

 1

64. The value of the even part of the following signal at n=5 is: X[n]= 6 δ_3 [n-2]

 3

65. We have to do the following steps in order on g(t) to sketch g($\frac{t}{2}$-1):

 Shift by 1 to the right, then time expand by 2

66. Rotating the signal x[n] around the axis x=0 is an amplitude scaling

True

67. The eigenfunction of the homogeneous first order linear ordinary differential equation is the:

Exponential

68. The following signal is even . g(t) = (8 + 7t) sin(32t).

 False

69. The result of the following multiplication g[n] is

   None of the given options (the result is:
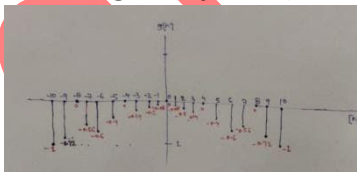
70. If the backward difference of the signal f[n] is given by: ✓
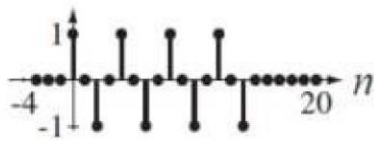
Then, f[5]=:

1

71. The signal g(t) is:
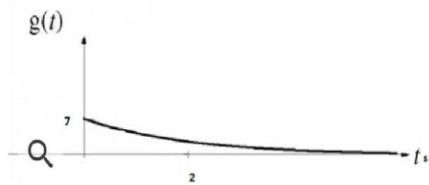
$7e^{-2t}u(t)$

72. the signal energy of the following signal is   x(t) = 5 rect((t-1)/2)

50

73. The discrete-time unit-impulse function suffers from the mathematical peculiarities that the continuous-time has unit impulse.

False

74. The numerical value of the following function is

$$4 \int_{0}^{20} \delta_4 (t - 2) \, rect(t) \, dt$$

0

75. the function represented in the following figure is

5 *cos (400*pi*t +0.4*pi)
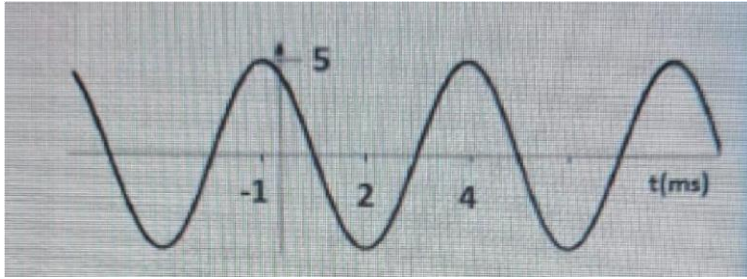
76. The signal $x[n] = 5cos(pi\frac{(n-1)}{4})$ is a DT even signal. **Select one:**

false

77. The energy of the odd part of an even signal is zero.

True

78. The relation between the following signals is given by: g2[n]=b g1[a(n-n0)]. The values of B, a, n0 are respectively given as:
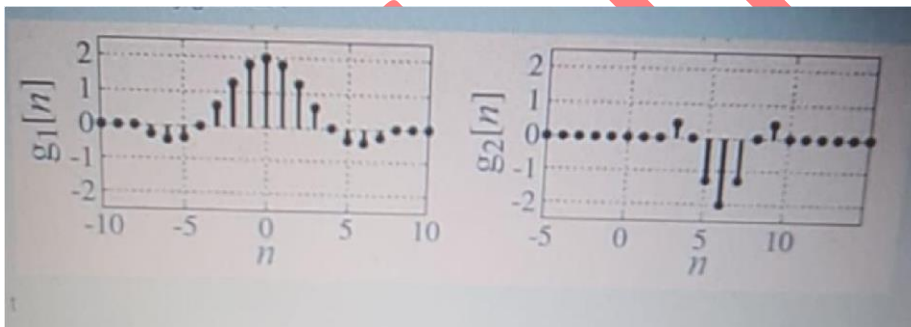
-1,2,6

79. The following signal is $g\ (t) = cos(\pi^2 t) + sin(\frac{2\pi}{3} 2t)$ **select one:**   **Periodic with period 6/ π**

80. The period of the following signal is :

$g\ [n] = sin(\frac{10}{3}\pi n)$

3

81. **The following signal:**

:Is the derivative of the signal

:Select one
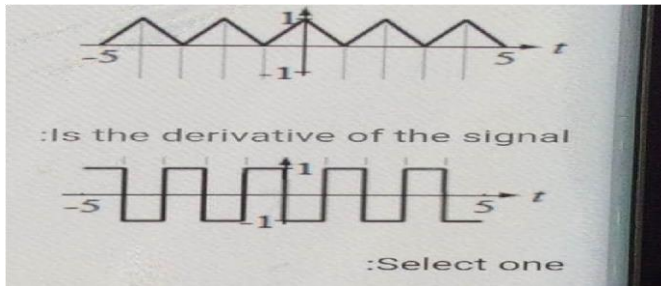
False

82. **For what value of k, will the following system be time invariant? y(t) = x(t) + x(kt) − x(2t) + x(t-1**

2

83. **Comment on the causality of y[n] = x[-n].**
Non causual

84. **Determine the nature of the system: y(t)= t2 x(t-1)** Linear , time variant

85. **n u[n] equal to:**

ramp[n]

86. **The Fourier series coefficient over fundamental period for the periodic signal x(t) = sin(2 pi t)**

1. **The unit step function u(t) is integral of   with respect to time t.**
Impulse function

2. **To obtain a maximum output voltage, the Q-point of the transistor should be located---**

Answar: a. at halfway between cutoff and saturation

1. The transistor bias circuit that has the worst stability is the bias circuit.   Answer: base

1. Clipping in the output signal of small-signal amplifies can occur because-----

Answer :   all of the mentioned

2. A system with y[n] = (0.7)" for n>0 is a stable system

Answer : False

3. Sinusoidal signals are deterministic signals

Answer : True

4. A closed-loop system simply responds directly to an input signal

Answer : False

5. The signal g(t) = 10sin(12t) + 4cos(18t) is a periodic signal

Answer : True

6. Zero-state response means no stored energy in the system

Answer : True

7. The numerical value of ramp(3t)8(t – 3)dtis

Answer : None of the answers

8. The value of the signal gin) = ramp[6]-u[0] is

Answer: 5

9. The value of the signal gin]= 2)5 ,12-اشارة الجمع n o|n + 15]) is

Answer : 30

10. The numerical value of ١٠ ل٤تكامل من -ramp(3t)6(t- 3)dtis

Answer: 9

11. If two functions are odd, their sum and difference are even

Answer : False

12. The system whose input-output relationship is y(t) = exp(x(t)) is a homogeneous system

Answer : False

13. A system with h(t) = e(-V/10)u(t) is a BIBO stable system

Answer : True

14. The fundamental period of g(n)=cos(/5) + cos(2ttn/3) is

Answer: 15

15. The even part of the signal g(t) = 2t²-3t+6 is -3t

Answer : false

16. Any measuring instrument is a dosed-loop system

Answer : False

17. The energy of the signal g(t) = rect(t)cos(18t) is

Answer: 1/2

18. Any system that is both additive and homogeneous is a linear system

Answer : True

19. The system whose input-output relationship is y(t) = exp(x(t)) is a homogeneous system Answer : False

20. A system with y[n] = (0.7)" for n>0 is a stable system

Answer : False

21. The signal energy of x[0]=(1/2)Mu[n] is

Answer : 4/3

22. Convolution is a technique used for finding the response of LTI systems to arbitrary input signals for only continues time systems

Answer : False

23. The impulse response h[n] of a system described by 5yln] + 2y[n-1] - 3y[n-2] = x[n] is

Answer : ((0.125)(-1)" + (0.075)(0.6)]u[n]

24. The power of a signal is calculated to be 1/3, then the signal mean square value equals Answer: 1/3

25. For the given periodic function g(t) = , -<t<Tt. The coefficient b; of the Fourier series associated with g (t) can be computed as

Answer: 0

26. For the given periodic function g) = t, 0<t<2n. The coefficient a, of the Fourier series associated with g(t) can be computed as

Answer: باي

27. For a trigonometric Fourier series associated with a periodic function g(t), given that the coefficients a, = 0.5, a = 0.25, and by = 2, then the coefficients Co, C, and 0, of the compact Fourier series can be computed as

Answer : 0.5, 2.016, -1.45

28. For the given periodic function g(t) = t-, -<t<tt. The coefficient b, of the Fourier associated with g (t) can be computed as

Answer : 0

29. For a CTS described by 3y"(t) - 2y' (t) + 4y(t) = 5x"(0-3x (t)+7x(t), the transfer function of the system is

Answer: [5s 35+71/[352-25+4]

30. Convolution is a technique used for finding the response of LTI systems to arbitrary input signals for only continues time systems

31. For x(t) = 8cos(200nt), y(t) = A,cos(200nt+0), and HG200rt)=0.32*40.5, then

32. For a DTS described by 2y[n] - 3y(n-1] + 5y[n-2] = 5x[n], the transfer function of the system is

33. For two systems connected in parallel, where hi(n) = 10 1 -15 31, and heln) = [1 -10-3 21, for - 3<n<3, then the equivalent impulse response of the system is

34. The impulse response h[n] of a system described by 8yln] + 6y[n-1] = x[n] is

35. Given that x[n] = sin(2ttn/6] * 28[n-11, then the value of x[4] is

36. The response of an LTI continues time system excited by a unit step is the derivative of the impulse response

37. Given that x[n] = u[n] * 48[2n], then the value of x[1] is

38. Given that g(t) = rect(t/4) * 28(4t), then the value of g(0) is

39. Given that y(t) = 4sin(mt/8) * 3e-2, then y'(t) = 3e2t * (Tt/2)cos(nt/8)

40. Given that g[n]= [(0.25)" + (-1)^1 * [n-2], then the value of g[2] is

41. Given that x[n] = ramp[n] * 38[n-1], then the value of x[4] is

42. rect(t)*8(-4) = rect(t-4)*8(t)

43. Which condition determines the causality of the LTI system in terms of its impulse response

Answer: Only if the value of an impulse response is zero for all negative values of time

44. A discrete time system is stable if its impulse response is absolutely summable

Answer: True

45. For x[n] = A cos(2 /5 + 0), y[n] = 8cos(2tn/5-0.5), and H(21/5) = 0.5e-70.8, then

Answer: A -16, Θ-0.3

46. For x(t) = 8cos(200rt), y(t) = A,cos(200rt+0), and H(2007)=0.3e-05, then

Answer: d. A,= 24, 0=-0.5

47. The impulse response h[n] of a system described by 5y[n] + 2y[n-1] - 3y[n-2] = x(n) is

Answer: [(0.125)(-1)" + (0.075)(0.6)"Ju[n]

48. The impulse response h[n] of a system described by 8y[n] + 6y[n-1] = x[n] is

Answer: (0.125)(-0.75)^u[n]

49. For x[n] = 8cos(2nn/5), y[n] = A,cos(2nn/5+0), and He/21/5) = 0.4e-0.7, then

Answer: Ay= 3.2, 0=-0.7

50. The impulse response h[n] of a system described by 8yln] + 6y[n-1] = x[n] is Answer: (0.125)(-0.75)"u[n]

The following signal is:
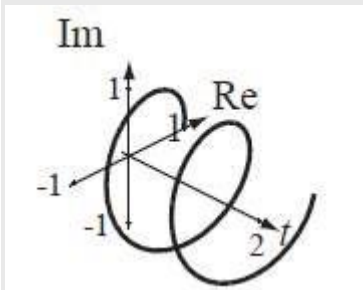
Select one:

The correct answer is:
$e^{(j2\pi t)}$

A function g[n] is defined as:
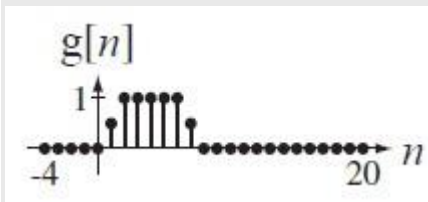
The value of 2g[3-2n] at n=-1 is

The correct answer is: 2

If y[n] is the first backward difference of x[n] given bellow, y[5]=
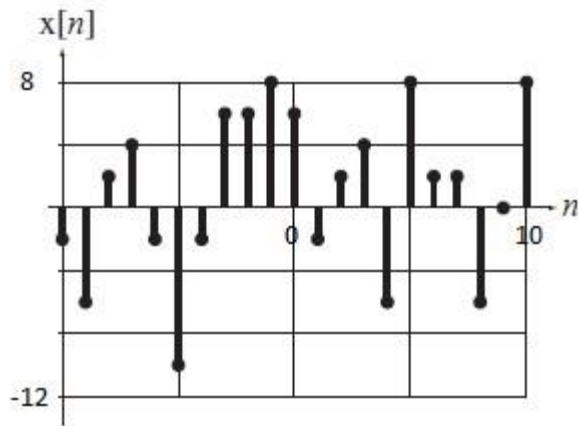
Select one:

The correct answer is: 14

سؤال 4

Find the value of h[n-1]*d[n-1], d[n] being the delta function. Select one:

The correct answer is: h[n-2].

سؤال 5

The value of the DT signal x[n]=4 cos(2 pi n/12) − 3 sin(2 pi (n − 2)/8) at n =4 is:

The correct answer is: -5

سؤال 6

Construct the inverse system of y(t) = 2x(t) Select one:

The correct answer is: y(t) = 0.5x(t)

سؤال 7

Does the following discrete system have the parameter of memory, y[n] = x[n-1] + x[n] ? Select one:

The correct answer is: Yes

Find the value of [d(t-3) – d(t-1)] * x[t+3]. Select one:

The correct answer is: x(t) – x(t+2)

If h1, h2 and h3 are cascaded, and h1 = u(t), h2 = d(t) and h3 = d(t), find the overall impulse response Select one:

The correct answer is: u(t)

Make the convolution of the signals x(t) = e^{-2t} u(t) , h(t) = e^{3t} u(t). The output y(t) = Select one:

The correct answer is: y(t) = $(e^{-2t} – e^{-3t})$u(t)

shifting and/or scaling has been done on the following signal g(t) as follows. the correct functional expression for the shifted and/or scaled function is :
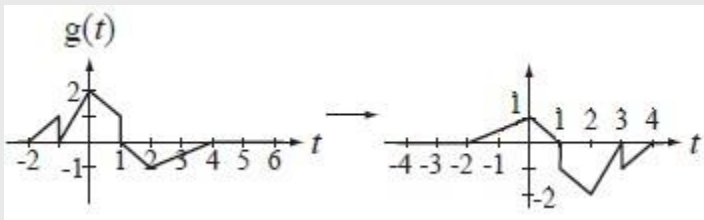
Select one:

The correct answer is: -g(2-t)

Find the value of d(t-34)*x(t+56), d(t) being the delta function. Select one:

The correct answer is: x(t + 22)

The signal g(t) is:

$g(t)$

7

2

t s
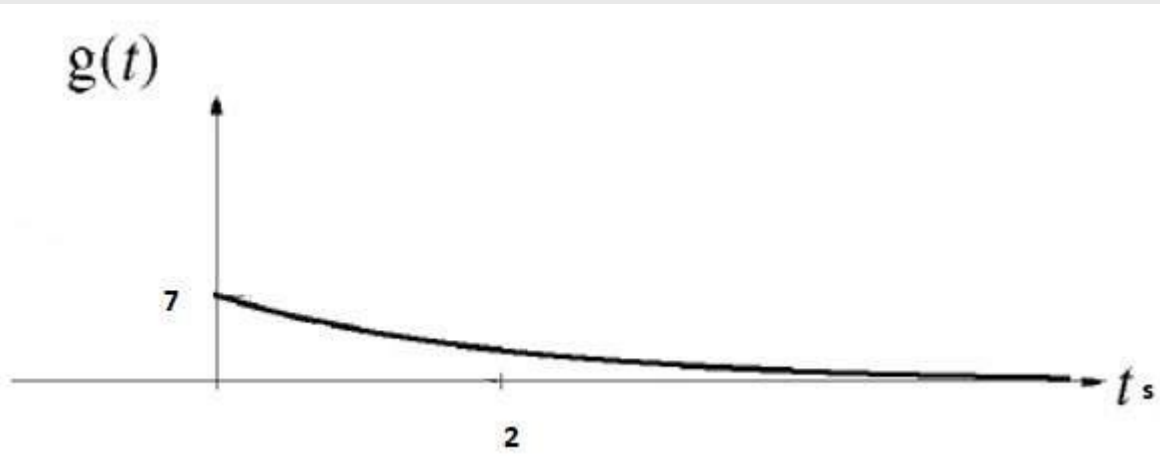
Select one:

The correct answer is: $7e^{-t/2}u(t)$ سؤال 14

The result of the following multiplication g[n] is:

$g_1[n]$

$g_2[n]$

$g[n]$

Multiplication

Select one:

a.

n
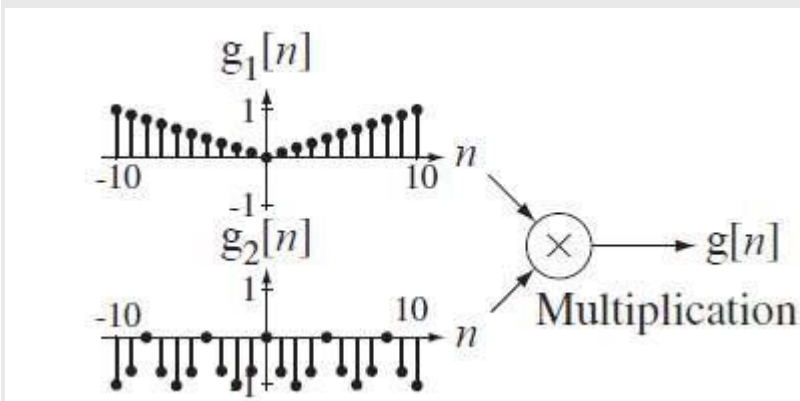
b.

c.

d.

e.
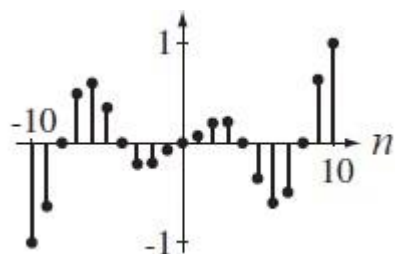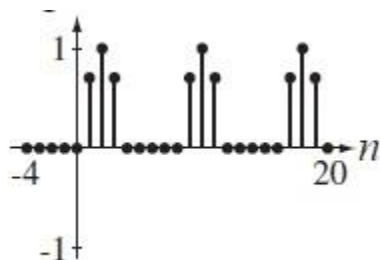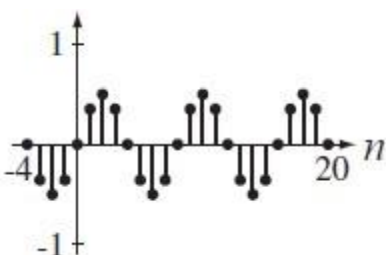
None of the given options

The correct answer is: None of the given options

سؤال 15

Determine the nature of the system: $y(t) = t^2 x(t-1)$ Select one:

The correct answer is: Linear, time variant

If the backward difference of the signal f[n] is given by:
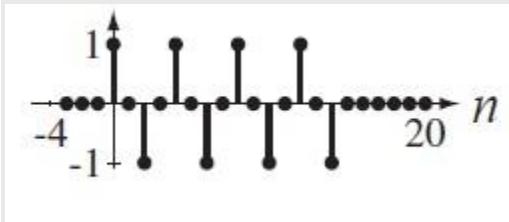
Then, f[5]=

Select one:

The correct answer is: 1

g1(t) and g2(t) are given bellow. g2(t) =A g1(t/w-t0), the values of A, w, t0 are:
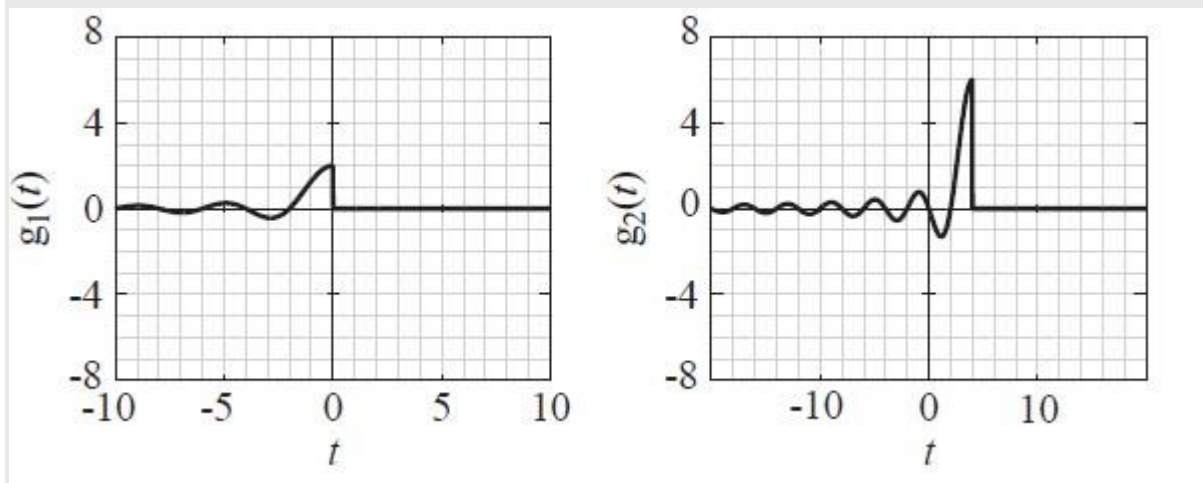
Select one:

The correct answer is: A=3, w=1/2, t0=4

The eigenfunction of the homogeneous first order linear ordinary differential equation is the:

The correct answer is: exponential

State if the following system is periodic or not. y(t) = sin(sqrt(2)*x(t)) Select one:

The correct answer is: No

If the input-output relationship is given by y(t) = 2x(t) d⁄dt x(t). What kind of system it represents? Select one:

The correct answer is: Non linear system

The following signal is odd:

g(t) = 12 + sin(4t)/4t

Select one:

○ True

◉ False

We have to do the following steps in order on g(t) to sketch g(2t-1):

Select one:

○ a.shift by 1 to the left, then time compress by 2

◉ b.shift by 1 to the right, then time compress by 2

○ c.shift by 1 to the left, then time expand by 2

○ d.shift by 1 to the right, then time expand by 2

The impulse response h (t) of an LTI system is given by e^{-2t} u(t) . What is the step response?

Select one:

○ a.y(t) = 1⁄2 (e^{-2t}) u (t)

○ b.y(t) = 1⁄2 (1 − e^{-2t})

◉ c.y(t) = 1⁄2 (1 − e^{-2t}) u (t)

○ d.y(t) = (1- e^{-2t}) u (t)

Compute u (t) convolved with itself?

Select one:

○ a.y(t)=u(t)

○ b.y(t)=t2.u(t)

○ c.y(t)=t.u(t-1)

◉ d.y(t)=t.u(t)

Determine the nature of the system: $y(t) = t^2 x(t-1)$

Select one:

○ a.Non-linear, time invariant

◉ b.Linear, time variant

○ c.Non-linear, time variant

○ d.Linear, time invariant

Find the value of h[n]*d[n-1], d[n] being the delta function.

Select one:

○ a.h[n+1].

○ b.h[n-2].

◉ c.h[n-1].

○ d.h[n].

Construct the inverse system of $y(t) = 2x(t)$

Select one:

◉ a.y(t) = 0.5x(t)

○ b.y(t) = 2x(t)

○ c.y(2t) = x(t)

○ d.y(t) = x(2t)

An odd function described over the time t>0 as follows:

$x(t) = 0, \ 0 \leq t < 5$

$= 3-7t, \ 5 \leq t < 10$

$= 0, \ t \geq 10$

The derivative of the function at t= -8 is equals to:

Select one:

○ a.-7

○ b.4

○ c.None of the given options

○ d.7

○ e.-4

Find the value of [d(t) − d(t-1)] * -x[t+1].

Select one:

○ a.x(t) − x(t+1)

○ b.x(t-1) − x(t+1)

○ c.x(t+1) − x(t)

○ d.x(t) − x(t-1)

The fundamental period of the signals g[n] = sin(13 π n / 6) − cos(9 π n / 7)

Select one:

○ a.None of the given options

○ b.18

○ c.14

○ d.16

○ e.12

State whether the differentiator system is a stable system or not.

Select one:

○ a.False

○ b.True

Determine the nature of the given system: y(t)=sin (x(t))

Select one:
- ⊙ a.Causal, Non-linear
- ○ b.Causal, Linear
- ○ c.Non-Causal, Non-linear
- ○ d.Non-causal, Linear

Feedback

The correct answer is: Causal, Non-linear

Find the value of h[n]*d[n+1], d[n] being the delta function.

Select one:
- ○ a.h[n-1].
- ⊙ b.h[n+1].
- ○ c.h[n].
- ○ d.h[n-2].

Feedback

The correct answer is: h[n+1].

The discrete-time unit-impulse function suffers from the mathematical peculiarities that the continuous-time unit impulse has.

Select one:
- ○ True
- ⊙ False

Feedback

The correct answer is 'False'.

For what value of k, will the following system be time invariant? y(t) = x(t) + x(kt) − x(2t) + x(t-1)

Select one:
- ○ a.1
- ○ b.2.5
- ⊙ c.2
- ○ d.3

Feedback

The correct answer is: 2

15-If y[n] is the first forward difference of x[n] given bellow, y[5]=

Select one:

○ a.14

◉ b.-6
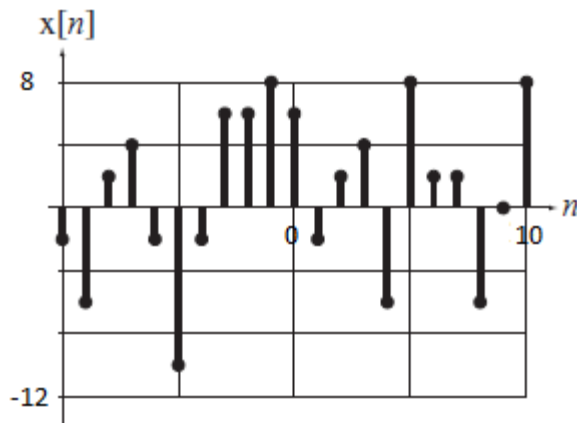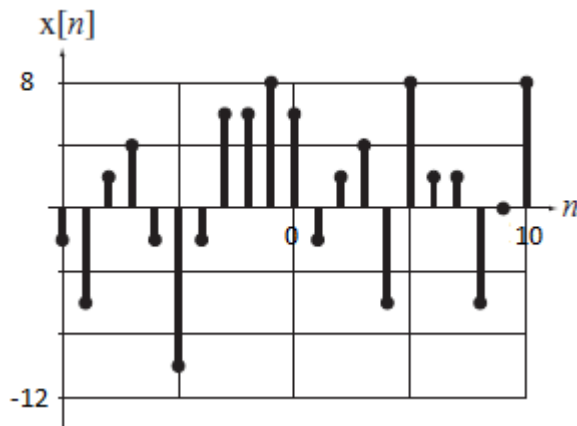
○ c.None of the given options

○ d.2

○ e.7

The correct answer is: -6

16-The value of the function sgn(-t) rect((-t+1)/2) ramp(t) at t=0.5 is:

Select one:

○ a.-1

◉ b.0

○ c.1

○ d.None of the given options

The correct answer is: None of the given options

The relation between the following signals is given by: g2[n]=B g1[a(n-n0)]. the values of B, a, n0 are respectively given as :

t

Select one:

○ a.-1, 1, 0

○ b.-1, 2, 6

◉ c.-1, 2, 1

d.-1, 1, 2

the complex number (9-j6) in polar form is:

Select one:

a.3.9 ∠33.7

b.3.9 ∠-33.7

c.10.8 ∠-33.7

● d.10.8 ∠33.7

The average power of the following periodic signal is:

Select one:

a.0

b.19.4

c.3.5

● d.None of the given options

e.136

Determine the nature of the system: $y(t) = t^2 x(t-1)$

Select one:

○ a.Non-linear, time invariant

○ b.Linear, time variant

○ c.Non-linear, time variant

○ d.Linear, time invariant

The following signal is odd:

$g(t) = 12 + \sin(4t)/4t$

Select one:

○ True

◉ False

We have to do the following steps in order on g(t) to sketch g(2t-1):

Select one:

○ a.shift by 1 to the left, then time compress by 2

◉ b.shift by 1 to the right, then time compress by 2

○ c.shift by 1 to the left, then time expand by 2

○ d.shift by 1 to the right, then time expand by 2

The impulse response h (t) of an LTI system is given by $e^{-2t} u(t)$. What is the step response?

Select one:

○ a.$y(t) = 1/2\ (e^{-2t})\ u\ (t)$

○ b.$y(t) = 1/2\ (1 - e^{-2t})$

◉ c.$y(t) = 1/2\ (1 - e^{-2t})\ u\ (t)$

○ d.$y(t) = (1 - e^{-2t})\ u\ (t)$

Compute u (t) convolved with itself?

Select one:

○ a.y(t)=u(t)

○ b.y(t)=t2.u(t)

○ c.y(t)=t.u(t-1)

◉ d.y(t)=t.u(t)

Determine the nature of the system: $y(t) = t^2\, x(t-1)$

Select one:

○ a.Non-linear, time invariant

○ b.Linear, time variant

○ c.Non-linear, time variant

◉ d.Linear, time invariant

Find the value of h[n]*d[n-1], d[n] being the delta function.

Select one:

○ a.h[n+1].

○ b.h[n-2].

◉ c.h[n-1].

○ d.h[n].

Construct the inverse system of y(t) = 2x(t)

Select one:

◉ a.y(t) = 0.5x(t)

○ b.y(t) = 2x(t)

○ c.y(2t) = x(t)

○ d.y(t) = x(2t)

An odd function described over the time t>0 as follows:

x(t) = 0, 0 ≤ t < 5

= 3-7t, 5 ≤ t < 10

=0, t ≥ 10

The derivative of the function at t= -8 is equals to:

Select one:

○ a.-7

○ b.4

○ c.None of the given options

○ d.7

○ e.-4

Find the value of [d(t) – d(t-1)] * -x[t+1].

Select one:

○ a.x(t) – x(t+1)

○ b.x(t-1) – x(t+1)

○ c.x(t+1) – x(t)

○ d.x(t) – x(t-1)

The fundamental period of the signals g[n] = sin(13 π n / 6) – cos(9 π n / 7)

Select one:

○ a.None of the given options

○ b.18

○ c.14

○ d.16

○ e.12

State whether the differentiator system is a stable system or not.

Select one:

◉ a.False

◯ b.True

Determine the nature of the given system: y(t)=sin (x(t))

Select one:

◉ a.Causal, Non-linear

◯ b.Causal, Linear

◯ c.Non-Causal, Non-linear

◯ d.Non-causal, Linear

Find the value of h[n]*d[n+1], d[n] being the delta function.

Select one:

◯ a.h[n-1].

◉ b.h[n+1].

◯ c.h[n].

◯ d.h[n-2].

The discrete-time unit-impulse function suffers from the mathematical peculiarities that the continuous-time unit impulse has.

Select one:

◯ True

◉ False

For what value of k, will the following system be time invariant? $y(t) = x(t) + x(kt) - x(2t) + x(t-1)$

Select one:

○ a.1

○ b.2.5

◉ c.2

○ d.3

15-If y[n] is the first forward difference of x[n] given bellow, y[5]=

Select one:

○ a.14

◉ b.-6

○ c.None of the given options

○ d.2

○ e.7

16-The value of the function sgn(-t) rect((-t+1)/2) ramp(t) at t=0.5 is:

Select one:

○ a.-1

◉ b.0

○ c.1

○ d.None of the given options

The relation between the following signals is given by: g2[n]=B g1[a(n-n0)]. the values of B, a, n0 are respectively given as :

t

Select one:

- a.-1, 1, 0
- b.-1, 2, 6
- ⦿ c.-1, 2, 1
- d.-1, 1, 2

the complex number (9-j6) in polar form is:

Select one:

- a.3.9 ∠33.7
- b.3.9 ∠-33.7
- c.10.8 ∠-33.7
- ⦿ d.10.8 ∠33.7

The average power of the following periodic signal is:

Select one:

- a.0
- ⦿ b.19.4

c.3.5

d.None of the given options

e.136

Determine the nature of the system: y(t)= t² x(t-1)

Select one:

a.Non-linear, time invariant

b.Linear, time variant

c.Non-linear, time variant

● d.Linear, time invariant

Use Parseval's theorem to find the energy of: 5 sinc (t/3)

Select one:

● a.None of the given options

b.45

c.25

d.20

e.75

Find A and B if: 10 cos(4 pi t) ←FT→ A δ (f-B) +A δ (f+B)

a.None of the options

b.10, 2

c.5 , 4

d.10 , 4

● e.5 , 2

The CTFS of the signal x(t)= 10 cos (500 pi (t - 0.001)) is:

Select one:

○ a.5j(δ[k +1]+δ[k −1])

○ b.5(δ[k +1]+δ[k −1])

◉ c.5j(δ[k +1]−δ[k −1])

○ d.5(δ[k +1]−δ[k −1])

The Fourier series coefficient over fundamental period for the signal 10 δ_5(t) is _____

Select one:

○ a.Cos (π2 k)

○ b.sin (π2 k)

◉ c.2 δ[k]

○ d.1 δ[k]

Find the CTFT of x(t)= 4 cos(100 pi t) cos(20 pi t) :

Select one:

◉

a.j [δ(f − 60) +δ(f +60) +δ(f −40) +δ(f + 40)]

○ b.j [δ(f − 90) +δ(f +110) -δ(f −110) -δ(f + 90)]

○ c.δ(f − 60) +δ(f +60) +δ(f −40) +δ(f + 40)

○ d.δ(f − 90) +δ(f +110) -δ(f −110) -δ(f + 90)

○ e.None of the given options

Find the value of d(t-34)*x(t+56), d(t) being the delta function.

Select one:

○ a.x(t − 22)

○ b.x(t + 56)

○ c.x(t + 32)

◉ d.x(t + 22)

Find the value of [d(t) − d(t-1)] * -x[t+1].

Select one:

◉ a.x(t) − x(t+1)

○ b.x(t) − x(t-1)

c.x(t-1) − x(t+1)

d.x(t+1) − x(t)

If h1, h2 and h3 are cascaded, and h1 = u(t), h2 = d(t) and h3 = d(t), find the overall impulse response

Select one:

a.d(t)

b.s(t)

◉ c.u(t)

d.all of the mentioned

Compute u (t) convolved with itself?

Select one:

◉ a.y(t)=t.u(t)

b.y(t)=t.u(t-1)

c.y(t)=t2.u(t)

d.y(t)=u(t)

Evaluate (exp(-at)u(t))*d(t), d(t) being the unit impulse.

Select one:

◉ a.exp(-at) u(t)

b.(1-exp(at)) u(-t)/a

c.(1+exp(-at)) u(t)/a

d.(1-exp(-at)) u(t)

Find the value of h[n-1]*d[n-1], d[n] being the delta function.

Select one:

◉ a.h[n-1].

b.h[n-2].

c.h[n+1].

d.h[n].

Find the value of h[n]*d[n-5], d[n] being the impulse function.

Select one:

○ a.d[n-4].

◉ b.h[n-5].

○ c.d[n-5].

○ d.h[n-4].

Convolution is considered in case of _____

Select one:

○ a.Discrete time systems only

○ b.Superposition of various outputs

○ c.Continuous time only

◉ d.In both continuous time and discrete time

Make the convolution of the following signals, and determine the correct answer:
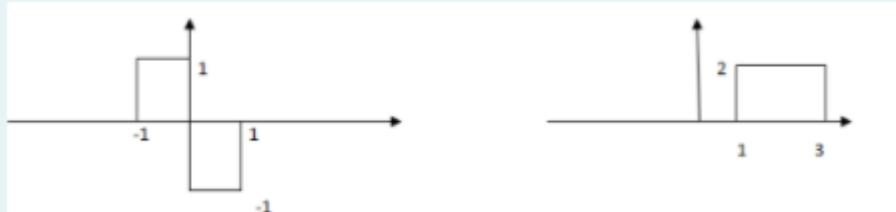
○ a.Y (0) = 2, y (1) = 2, y (3) = -2

○ b.Y (-1) = 0, y (1) = 3, y (3) = 2

○ c.Y (-1) = 0, y (1) = 0, y (3) = 2

◉ d.Y (0) = 0, y (1) = 2, y (3) = -2

What is a unit impulse response?

Select one:

○ a.The response of an invariant system

○ b.The output of an input response signal

○ c.The output of a linear system

◉ d.The output of an LTI system due to unit Impulse signal

The Fourier series coefficient over fundamental period for the signal 10 δ_5(t) is _____

Select one:

○ a.sin (π2 k)

○ b.Cos (π2 k)

○ c.1 δ[k]

◉ d.2 δ[k]

Feedback

The correct answer is: 2 δ[k]

The total area under the function g(t) = 5 sinc ((t − 10)/20)

Select one:

○ a.250

◉ b.100

○ c.50

○ d.None of the given options

○ e.2000

Feedback

The correct answer is: 100

The Fourier series coefficient of the signal y(t) = Even{x(t)} is _____

Select one:

◉ a.(X[k]−X[−k]) / 2

○ b.(X[k]+X[−k]) / 2

○ c.(X[k]+X*[−k]) / 2

○ d.(X[k]−X*[−k]) / 2

The correct answer is: (X[k]+X[−k]) / 2

Find the values of the constants A and B if: 10 tri ((t −2)/8) ←FT→ A sinc² (8 f)e$^{-jB\,pi\,f}$

Select one:

○ a.2, 4

○ b.None of the options

○ c.10 , 4

◉ d.80 , 2

○ e.80 , 4

Feedback

The correct answer is: 80 , 4

Find the numerical value of x(1) if X(f)=20 [δ(f − 1) +δ(f +1)]

Select one:

○ a.20

◉ b.40

○ c.-40

○ d.None of the given options

○ e.-20

Feedback
The correct answer is: 40

Determine the nature of the system: y(t)= t² x(t-1)

Select one:

◉ a.Linear, time variant

○ b.Non-linear, time variant

○ c.Non-linear, time invariant

○ d.Linear, time invariant

Feedback
The correct answer is: Linear, time variant

If h1, h2 and h3 are cascaded, find the overall impulse response

○ a.h3

○ b.h1 + h2 + h3

○ c.all of the mentioned

◉ d.h1 * h2 * h3

The correct answer is: h1 * h2 * h3

The numerical value of the following function is:

$$4 \int_{0}^{20} \delta_4(t-2)\,\text{rect}(t)\,dt$$

Answer: [0]

Feedback
The correct answer is: 0

Is the system y(t) = Rx(t), where R is a arbitrary constant, a memoryless system?

Select one:

◉ a.Yes

○ b.No

Feedback
The correct answer is: Yes

Which of the following systems is linear?

Select one:

○ a.y(t) = sin(x(t))

○ b.y(t) = log(x(t))

○ c.y(t) = cos(x(t))

◉ d.y(t) = dx(t)/dt

Find the value of [d(t) − d(t-1)] * -x[t+1].

Select one:

○ a.x(t+1) − x(t)

○ b.x(t-1) − x(t+1)

◉ c.x(t) − x(t+1)

○ d.x(t) − x(t-1)

g1(t) and g2(t) are given bellow. g2(t) =A g1(t/w-t0), the values of A, w, t0 are:
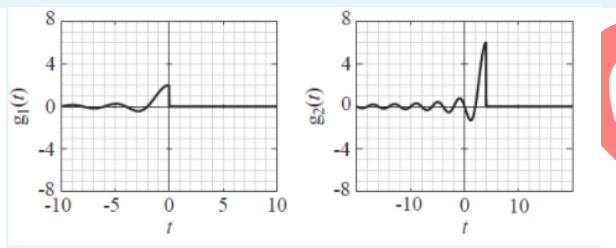
○ a.None of the given options

○ b.A=3, w=2, t0=4

◉ c.A=3, w=1/2, t0=4

○ d.A=3, w=2, t0=2

State whether the following system is periodic or not. y(t) = log(sin(x(t)).

Select one:

◉ a.No

○ b.Yes

A system with memory which anticipates future values of input is called _____

Select one:

○ a.Causal System

○ b.Non-anticipative System

◉ c.Non-causal System

○ d.Static System

We have to do the following steps in order on g(t) to sketch g(2t-1):

Select one:

○ a.shift by 1 to the right, then time expand by 2

○ b.shift by 1 to the left, then time expand by 2

○ c.shift by 1 to the left, then time compress by 2

◉ d.shift by 1 to the right, then time compress by 2

If g(t) = 7e^{-j2t-3}, g(jt) is equals to :

Select one:

○ a.7e^{-2t-3},

○ b. 7e^{-5}

◉ c. 7e^{2t-3},

○ d.None of the given options

○ e. 7e^{-1}

The energy of the odd part of an even signal is zero

◉ True

○ False

ind the value of [d(t) – u(t-1)] * x[t+1].

Select one:

◉ a.x(t+1) – integration of x(t) from –inf to t

○ b.{integration of x(t-1) from –inf to t} – x(t+1)

○ c.x(t) – integration of x(t-1) from –inf to t

○ d.{integration of x(t) from –inf to t} – x(t+1)

If the backward difference of the signal f[n] is given by:

Then, f[4]=

Select one:

○ a.5

○ b.0

○ c.-1

◉ d.1
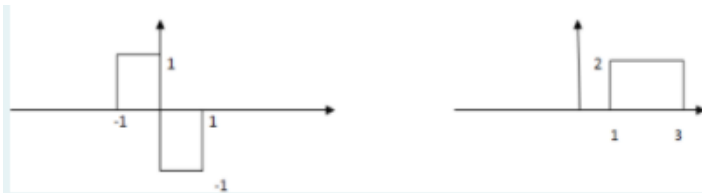
Make the convolution of the following signals, and determine the correct answer:

○ a.Y (-1) = 0, y (1) = 0, y (3) = 2

◉ b.Y (0) = 0, y (1) = 2, y (3) = -2

○ c.Y (0) = 2, y (1) = 2, y (3) = -2

○ d.Y (-1) = 0, y (1) = 3, y (3) = 2

Find the value of h[n]*d[n-5], d[n] being the impulse function.

Select one:

◉ a.h[n-5].

○ b.d[n-4].

○ c.h[n-4].

○ d.d[n-5].

One of the following signals is not periodic:
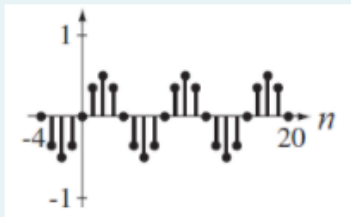
One of the following signals is not periodic:

Select one:

a.
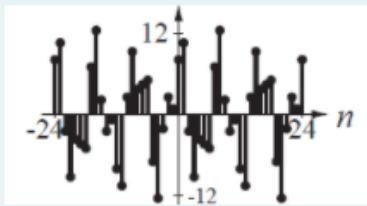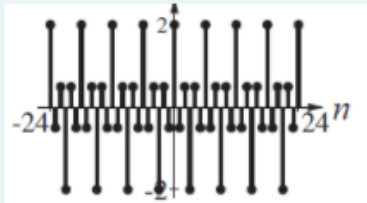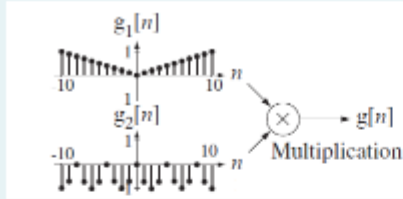
b. sin(9 pi n /7)

c.

d.

e. None of the given options

The correct answer is: None of the given options

The result of the following multiplication g[n] is:

The result of the following multiplication g[n] is:

Select one:

○ a.

○ b.

⦿ c. None of the given options

○ d.

○ e.

The correct answer is: None of the given options

The following signal is periodic:

g(t) = 3 sin(5t) + 4sin(√2 t)

Select one:

○ True

⦿ False

Feedback

The correct answer is 'False'.

The forward and backward difference of a signal give the same result.

Select one:

○ True

⦿ False

Feedback

The correct answer is 'False'.