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

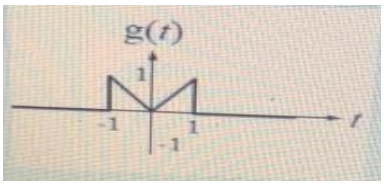
2. **A time invariant system is a system whose output :**

Decreases with a delay in input

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

4

4. **The energy of the following signal is :**



None of the given options (the options is: 1/2 , 1/3 , 2/3)

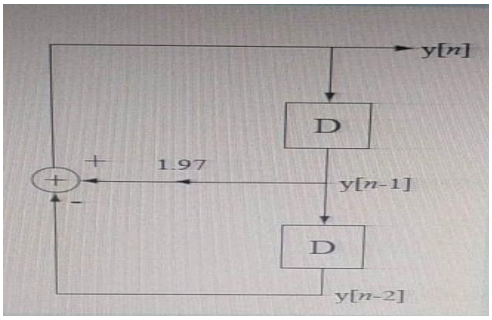
5. **The stability of a system is defined as:**

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

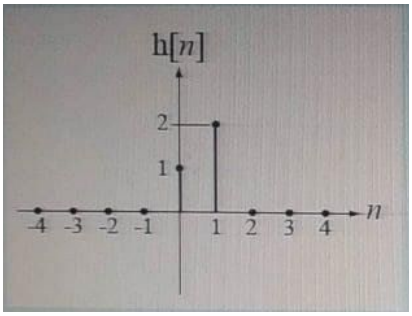
17. **If** $g(t) = 9\ rect\left(\frac{t}{2} - 4\right) * \delta(3t)$ **, g(8) is equal to:**

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

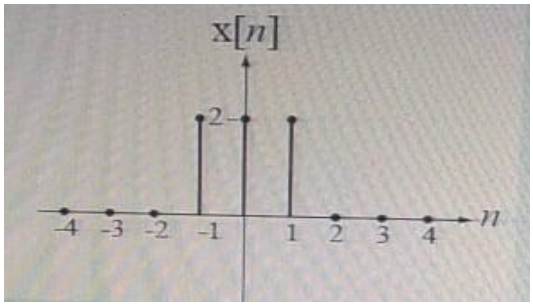
20. **The signal rect(t) , cos(t) is:**

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:**

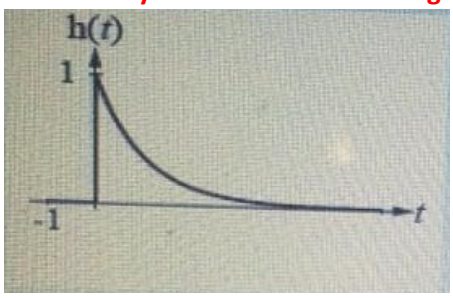
BIBO stable

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 $g(t) = 9\,rect\left(\frac{t}{2} - 4\right) * \delta(3t)$ **, 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.

$m\acute{y}(t) = Ks\,y(t) = mg + 30ks$

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

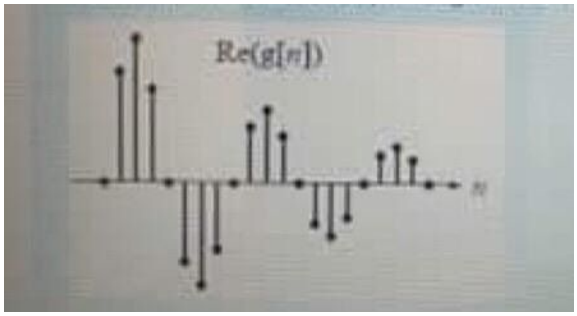
55. A system which is linear is said to obey the rules of :

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

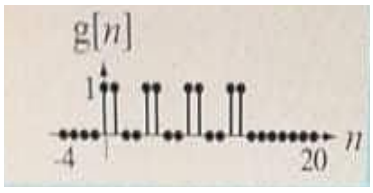
|z| =1

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

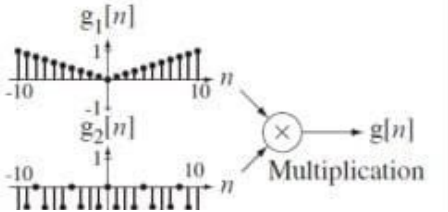
67. The eigenfunction of the homogeneous first order linear ordinary differential equation is the:

Exponential

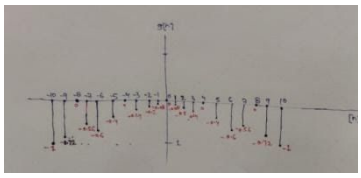
68. The following signal is even . g(t) = (8 + 7t) sin(32t).

False

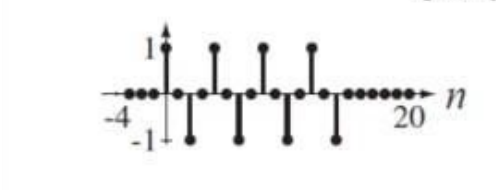
69. The result of the following multiplication g[n] is



None of the given options (the result is:



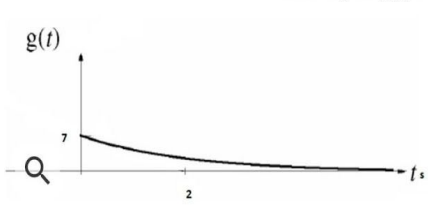
70. If the backward difference of the signal f[n] is given by: √



Then, f[5]=:

1

71. The signal g(t) is:



$7e^{-\frac{1}{2}}u(t)$

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.

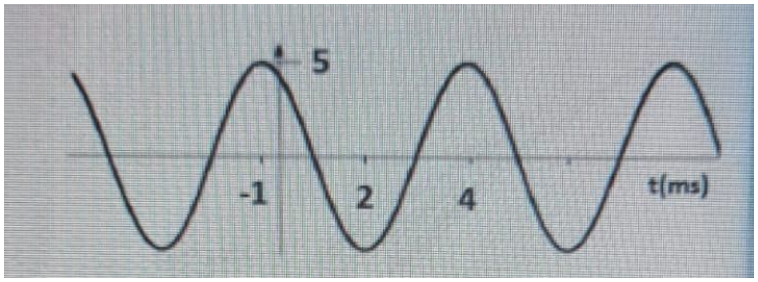
False

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)

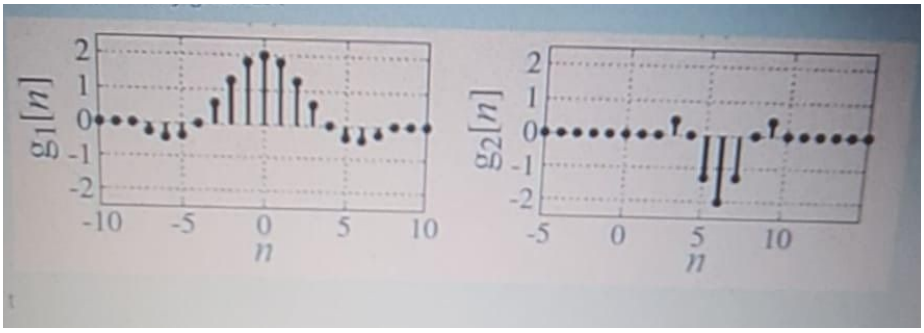
76. The signal $x[n] = 5cos(pi\frac{(n-1)}{4})$ *is a DT even signal.* **Select one:**

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 $g(t) = cos(\pi^2 t) + sin(\frac{2\pi^2 t}{3})$ **select one:**

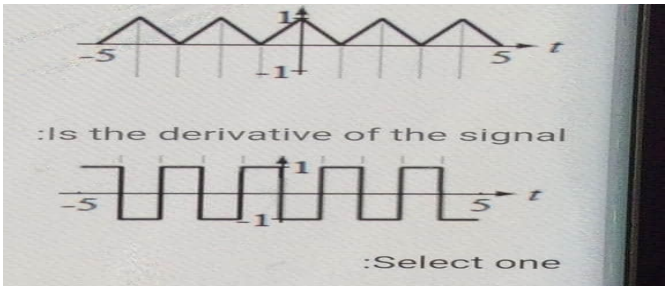
Periodic with period 6/ π

80. The period of the following signal is :

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

3

81. The following signal:



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 thebias 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 ل -٤ من تكاملramp(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) = $2t^2$-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

Answer : False

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

Answer : Ay= 2.4, 0=-0.5

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

Answer : 5/12-3z+5z-2]

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

Answer : h[n] = (1 0-125]

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

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

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

Answer: 0

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

Answer: False

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

Answer: 2

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

Answer: .5

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

Answe: True

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

Answer: 2

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

Answer: 9

42. rect(t)*8(-4) = rect(t-4)*8(t)
43. Answer: True
44. 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

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

Answer: True

46. 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

47. 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

48. 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]

49. 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]

50. 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

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

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