.. **Answer Sheet for Spring 2024 ECE45 Final Exam Part 1** **..**

Name _____

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	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	Override Answer
P1:	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	
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Problem 1:

Which of the following is <u>not</u> a periodic function of t ?

(a) $\cos^2(\pi t) - \pi t + \cos(2\pi) + \sin^2(\pi t)$

(b) $\cos(\cos(\cos t))$

(c) $\cos(|t|)$

(d) $\frac{1}{\sin t + \cos t}$

(e) $\tan(3\pi t)\cos(3\pi t)$

(f) $|\sin(5t)|$

(g) $|\tan t + 3\sin(2t)|$

(h) $\sqrt{1 - \cos(999t)}$

(i) $(\cos(1 + \tan t))^{999}$

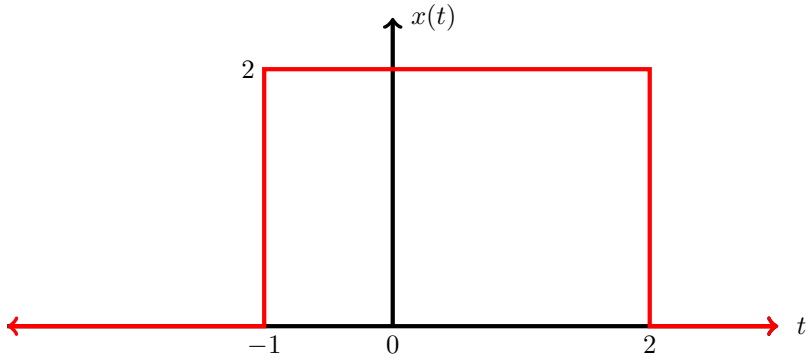
(j) $e^{jt\sqrt{2}}$

(k) $\displaystyle\sum_{n=1}^{\infty} \frac{e^{jnt}}{n^2}$

(l) None of these

Problem 2:

What is the value of the Fourier transform $X(\omega)$ of the real-valued signal $x(t)$ shown below, when $\omega = \pi/4$?



(a) $\frac{4\sqrt{2}}{\pi}\left(1+\sqrt{2}-j\right)$

(b) $-\frac{4\sqrt{2}}{\pi}\left(1+\sqrt{2}-j\right)$

(c) $-\frac{4}{\pi}\left(1+\sqrt{2}-j\right)$

(d) $-\frac{8\sqrt{2}}{\pi}\left(1+\sqrt{2}-j\right)$

(e) $-\frac{4\sqrt{2}}{\pi}\left(1+\sqrt{2}+j\right)$

(f) $-\frac{4\sqrt{2}}{\pi}\left(2+\sqrt{2}-j\right)$

(g) $-\frac{4\sqrt{2}}{\pi}\left(1+2\sqrt{2}-j\right)$

(h) $-\frac{4\sqrt{2}}{\pi}\left(1-\sqrt{2}-j\right)$

(i) $-\frac{4\sqrt{2}}{\pi}\left(-1+\sqrt{2}+j\right)$

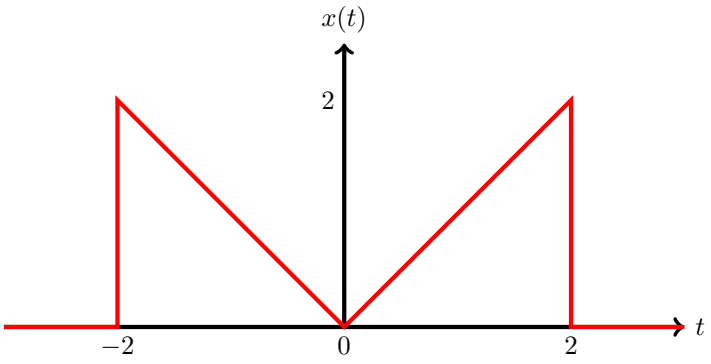
(j) $-4\sqrt{2}\left(1+\sqrt{2}-j\right)$

(k) $\frac{8\sqrt{2}}{\pi}\left(1+\sqrt{2}-j\right)$

(l) None of these

Problem 3:

Suppose the signal $x(t)$ is the input to a linear, time-invariant system whose impulse response is also $x(t)$. What is the value of the output signal $y(t)$ when $t = 0$?



(a) 16/3

(b) 16

(c) 8/3

(d) 4/3

(e) 1/3

(f) 8

(g) 4

(h) 2

(i) 1

(j) 1/2

(k) 32

(l) None of these

Problem 4:

Let $x(t)$ be a signal whose bilateral Laplace transform is $X(s) = \frac{s}{e^{\pi s} + s^2 e^{\pi s}}$ and such that the complex number $2^{2024} - j^{2024}$ lies in the region of convergence. What is the value of $x(t)$ when $t = \pi/4$?

(a) None of these

(b) $1/2$

(c) $-1/2$

(d) $\sqrt{3}/2$

(e) $-\sqrt{3}/2$

(f) 1

(g) -1

(h) $\sqrt{2}/2$

(i) $-\sqrt{2}/2$

(j) e

(k) $1/e$

(l) $1/3$

Problem 5:

What is the impedance of a parallel combination of a $1/\pi$ ohm resistor, a $1/\pi$ farad capacitor, and a $1/\pi$ henry inductor, if the voltage across them is a ten hertz sinusoid?

(a) $1/(\pi + 19.95j)$

(b) $\frac{1}{\pi} + 20\pi j$

(c) $\pi/(1 + 20\pi j)$

(d) $1 + 20\pi j$

(e) $\pi/(2\pi + 20\pi j)$

(f) $2\pi/(1 + 20\pi j)$

(g) $1 + 10.01j$

(h) $1 + 10j$

(i) $1/(1 + 10j)$

(j) $2\pi/(1 + 10j)$

(k) $\pi + 19.95j$

(l) None of these

Problem 6:

If $x(t)$ is the convolution of $2\text{rect}\,(t)$ with itself, then what is $x(1/4)$?

(a) 3

(b) 3/4

(c) 1/4

(d) 1/2

(e) 1

(f) 0

(g) 3/5

(h) 2/5

(i) 1/3

(j) 1/5

(k) -3

(l) 3/2

(m) None of these

Problem 7:

The Fourier series of a periodic signal $x(t)$ is

$$x(t) = \sum_{n=-\infty}^{\infty} F_n e^{jnt}$$

where $F_n = 0$ for all $n < 0$, and $F_n = 1/e^n$ for all $n \geq 0$. What is $x(t)$ when $t = 0$?

(a) $\frac{e}{e-1}$

(b) $\frac{e}{e+1}$

(c) $\frac{1}{e-1}$

(d) $\frac{1}{e+1}$

(e) $\frac{1}{e}$

(f) $\frac{1}{2}$

(g) $\frac{e}{e-2}$

(h) $\frac{e}{e+2}$

(i) $\frac{1}{e-2}$

(j) $\frac{1}{e+2}$

(k) $\frac{1}{3}$

(l) None of these

Problem 8:

If a system's output $y(t)$ is related to its input $x(t)$ by $y(t) = e^{tx(t)}$, then which of the following properties does the system have?

(a) causal, not linear, not time-invariant, not stable

(b) not causal, not linear, not time-invariant, not stable

(c) causal, stable, not linear, not time-invariant,

(d) causal, time-invariant, not linear, not stable

(e) linear, time-invariant, not causal, not stable

(f) linear, time-invariant, causal, not stable

(g) linear, time-invariant, stable, not causal

(h) linear, time-invariant, stable, causal

(i) time-invariant, not causal, not stable, not linear

(j) linear, not causal, not stable, time-invariant

(k) None of these

Problem 9:

Suppose a signal $x(t) = \sum_{n=-\infty}^{\infty} \delta(t-4n)$ is the input to an LTI system whose frequency response is $H(\omega) = \text{rect}\,(\omega)$. What is the output signal $y(t)$ of the system when $t = 2024$?

(a) $1/4$

(b) $1/2$

(c) $1/8$

(d) 4

(e) 2

(f) 8

(g) 1

(h) $\pi/4$

(i) $\pi/2$

(j) $\pi/8$

(k) π^2

(l) None of these

Problem 10:

What is the Fourier transform of $\frac{1/\pi}{\cos(2t)-j\sin(2t)}$?

(a) $2\delta(\omega-2)$

(b) $\delta(\omega-2)$

(c) $2\delta(\omega+2)$

(d) $\delta(\omega+2)$

(e) $2\pi\delta(\omega-2)$

(f) $2\pi\delta(\omega+2)$

(g) $\pi\delta(\omega-2)$

(h) $\pi\delta(\omega+2)$

(i) $\delta(\omega-2)+\delta(\omega+2)$

(j) $\delta(\omega-2)-\delta(\omega+2)$

(k) $2\delta(\omega-2)+2\delta(\omega+2)$

(l) $2\delta(\omega-2)-2\delta(\omega+2)$

(m) None of these

Problem 11:

If the bilateral Laplace transform of $x(t)$ is $X(s) = \frac{1}{s} + \frac{1}{s+4}$ and $X(e^{j\pi})$ exists, then what is $x(t)$?

(a) $e^{-4t}u(t) - u(-t)$

(b) $e^{-4t}u(t) + u(-t)$

(c) $e^{4t}u(t) - u(-t)$

(d) $e^{4t}u(t) + u(-t)$

(e) $e^{-4t}u(t) - e^{-t}u(-t)$

(f) $e^{-4t}u(t) + e^{-t}u(-t)$

(g) $e^{-4t}u(t) - u(t)$

(h) $e^{-4t}u(t) + u(t)$

(i) $e^{-4t}u(-t) - u(-t)$

(j) $-e^{-4t}u(-t) + u(t)$

(k) $-e^{-4t}u(-t) - u(-t)$

(l) None of these

Problem 12:

If $x(t)$ is the convolution of $\cos(2024\pi t)$ and $\text{rect}(t/45)$, then what is $x(\pi)$?

(a) None of these

(b) π

(c) 2π

(d) $2024\pi/45$

(e) $\pi/45$

(f) $2024/\pi$

(g) $\cos(2024\pi/45)$

(h) 1

(i) -1

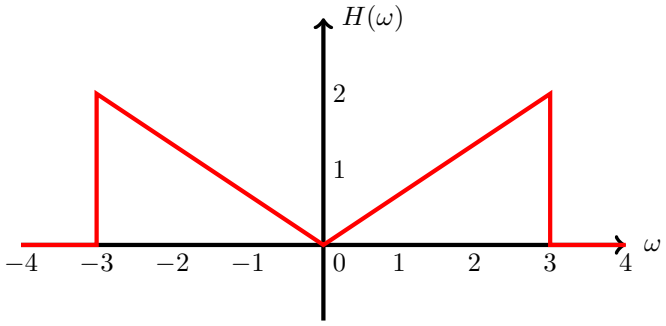
(j) 2

(k) -1

(l) $\cos(2024\pi^2)$

Problem 13:

Suppose $f(t)$ is a periodic function that can be written as $f(t) = \sum_{n=-\infty}^{\infty} \frac{e^{\pi jnt/2}}{1+n^2}$. If $f(t)$ is the input to an LTI system with frequency response $H(\omega)$ shown below, then what is the output $y(t)$?



(a) $\frac{\pi}{3}\cos(\pi t/2)$

(b) $\frac{2\pi}{3}\cos(\pi t/2)$

(c) $\frac{4\pi}{3}\cos(\pi t/2)$

(d) $\frac{2}{3}\cos(\pi t/2)$

(e) $\frac{2\pi}{3}\cos(t/2)$

(f) $\frac{2}{3}\cos(t/2)$

(g) $\frac{2\pi}{3}\cos(\pi t)$

(h) $\frac{\pi}{3}\cos(\pi t)$

(i) $\frac{\pi}{2}\cos(\pi t)$

(j) $\frac{1}{2}\cos(\pi t)$

(k) 0

(l) None of these

Problem 14:

What is the Fourier transform of $e^{-3t}u(t-1)$?

(a) $\frac{1}{(3+j\omega)e^{3+j\omega}}$

(b) $\frac{2}{(3+j\omega)e^{3+j\omega}}$

(c) $\frac{1}{(1+j\omega)e^{3+j\omega}}$

(d) $\frac{1}{e^{3+j\omega}}$

(e) $\frac{1}{(3+j\omega)}$

(f) $\frac{1}{(3+j\omega)e^{j\omega}}$

(g) $\frac{1}{(3-j\omega)e^{3+j\omega}}$

(h) $\frac{1}{(3-j\omega)e^{3-j\omega}}$

(i) $\frac{1}{(3+j\omega)e^{3}}$

(j) $\frac{1}{(3+j\omega)e^{3\omega}}$

(k) $\frac{1}{(3+j\omega)e^{3j\omega}}$

(l) None of these

Problem 15:

If $x(t) = \sum_{n=-\infty}^{\infty} \frac{e^{\pi jnt}}{1+n^4}$ then what is $x(2024) - x(2022)$?

(a) None of these

(b) 1

(c) 2

(d) $1/2$

(e) 4

(f) π

(g) 2π

(h) $1/\pi$

(i) 4π

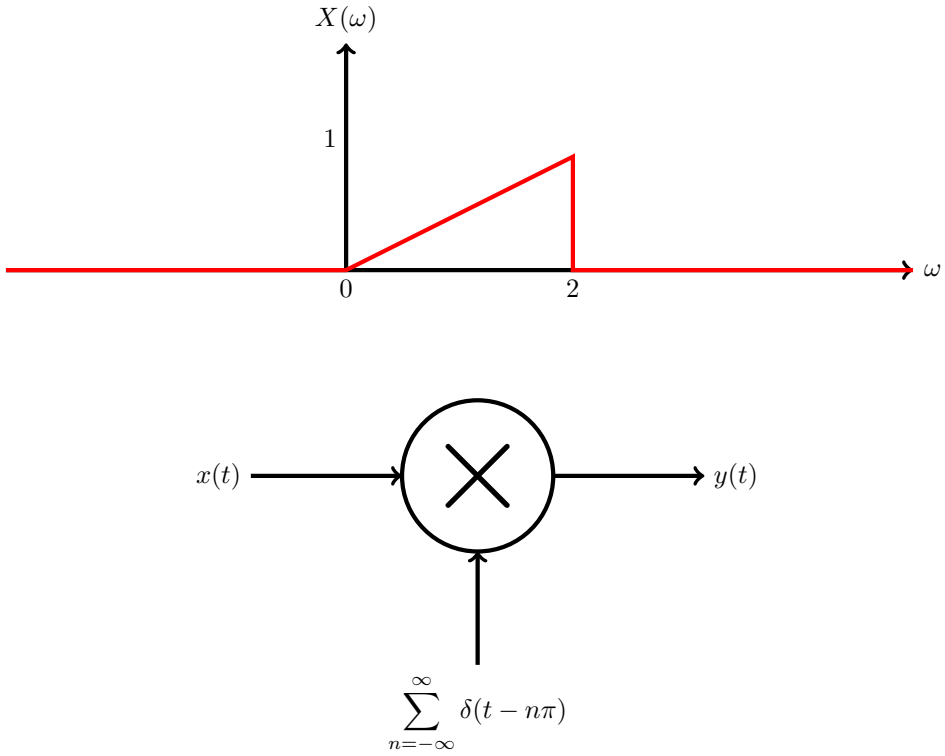
(j) -2

(k) -1

(l) $-\pi$

Problem 16:

The signal $x(t)$ has Fourier transform $X(\omega)$ shown below. In the block diagram shown, $y(t)$ is the output signal of the multiplier. What is the Fourier transform $Y(\omega)$ of the output when $\omega = 5$?



(a) $\frac{1}{2\pi}$

(b) $\frac{1}{4\pi}$

(c) $\frac{1}{4}$

(d) $\frac{1}{2}$

(e) $\frac{1}{\pi}$

(f) 2

(g) 1

(h) 0

(i) 4

(j) 4π

(k) 2π

(l) None of these

Problem 17:

If $j\cos(t)$ is the output of an LTI system when $\cos(2t)\cos(3t)$ is the input, then what is the output of the LTI system when $4je^{-jt}$ is the input?

(a) $-8e^{-jt}$

(b) $4je^{-jt}$

(c) $-4e^{-jt}$

(d) $8je^{-jt}$

(e) $-8e^{jt}$

(f) $4je^{jt}$

(g) $-4e^{jt}$

(h) $8je^{jt}$

(i) 0

(j) Cannot be determined from the given information

(k) None of these

Problem 18:

In the following four systems, the system's output $y(t)$ and the system's input $x(t)$ satisfy:

System 1: $y(t) = (t+1)^2 e^{(t+1)x(t-1)}$.
System 2: $y(t) = e^{x^2(t)}$.
System 3: $y(t) = \sum_{n=-10}^{10} x(t+n)$.
System 4: $y(t) = e^{jx(t+2^{-99})}$.

Which of these 4 systems are causal?

(a) Only 1 and 2

(b) All of them

(c) Only 1

(d) Only 2

(e) Only 3

(f) Only 4

(g) Only 2,3,4

(h) Only 1,3,4

(i) Only 1,2,4

(j) Only 1,2,3

(k) None of 1,2,3,4

(l) Only 1 and 3

(m) None of these answers

.. **Answer Sheet for Spring 2024 ECE45 Final Exam Part 2** **..**

Name _____

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	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	Override Answer
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Problem 19:

Which one of the following values of A makes the function $x(t) = e^{te^{A}}$ periodic?

(a) $j\pi/2$

(b) 1

(c) -1

(d) $\sqrt{2}$

(e) $j\pi$

(f) $-j\pi$

(g) $j\pi/4$

(h) $1 + j$

(i) $1 - j$

(j) 2π

(k) $\pi/2$

(l) $j/2$

(m) None of these

Problem 20:

If $x(t) = \delta(t) - \delta(t-1)$ and $y(t) = x(t) + x(t-1)$, then what is the Fourier transform $Y(\omega)$ when $\omega = \pi/12$?

(a) $(j + 2 - \sqrt{3})/2$

(b) $(j - 2 - \sqrt{3})/2$

(c) $(j + 2 + \sqrt{3})/2$

(d) $(-j + 2 - \sqrt{3})/2$

(e) $(j + 1)/2$

(f) $(j + 2)/2$

(g) $(2j - \sqrt{3})/2$

(h) $j + 2 - \sqrt{3}$

(i) $-j + 2 - \sqrt{3}$

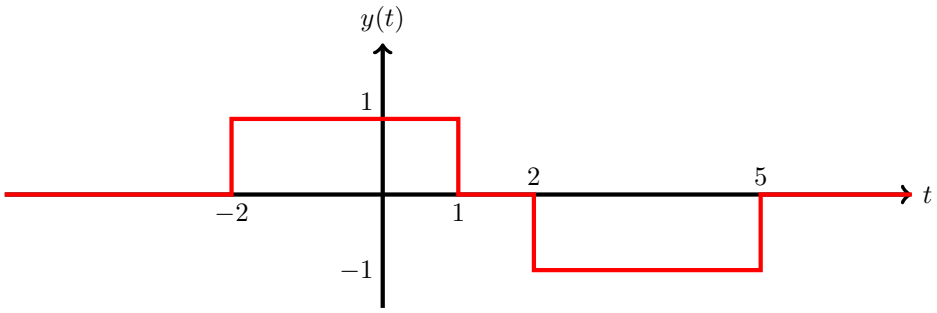
(j) $(j + 2 - \sqrt{2})/2$

(k) $(j + 2 - \sqrt{3})/4$

(l) None of these

Problem 21:

When the input to a certain LTI system is $\delta(t) - \delta(t-4)$, the output is $y(t)$ as shown below. What is the output of the system at time $t = \sqrt{2} \cdot e^{\pi j}$ when the input is $2\delta(t) + 3\delta(t-1) + 5\delta(t+1)$?



(a) 7

(b) 0

(c) 10

(d) 8

(e) 2

(f) 3

(g) 5

(h) 6

(i) -2

(j) -3

(k) -8

(l) None of these

Problem 22:

What is the bilateral Laplace transform of

$$\int_0^\infty e^{-\tau} u(t-\tau)u(\tau)d\tau?$$

(a) $\frac{1}{s+s^2}$

(b) $\frac{1}{s+1}$

(c) $\frac{1}{s}$

(d) $\frac{1}{s-s^2}$

(e) $\frac{1}{s^2-s}$

(f) $\frac{1}{s-1}$

(g) $\frac{s}{s+1}$

(h) $\frac{s}{s-1}$

(i) $\frac{s-1}{s+s^2}$

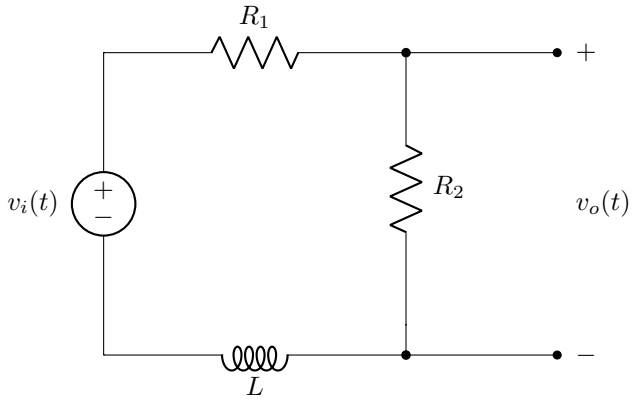
(j) $\frac{2}{s+s^2}$

(k) $\frac{1}{s+s^3}$

(l) None of these

Problem 23:

In the steady-state circuit below, the inductor is $L = 25$ milihenries, the resistors are $R_1 = 2$ and $R_2 = 1$ ohm, and the magnitude of the circuit's frequency response is 0.2 when the voltage source is $v_i(t) = 8\cos(\omega t)$ with $\omega > 0$. What is the value of ω?



(a) 160

(b) 80

(c) 320

(d) 16

(e) 40

(f) 16π

(g) 8π

(h) 1/10

(i) 1/40

(j) 25

(k) 0.0025

(l) None of these

Problem 24:

If $x(t) = e^{-2t}u(t)$ and $y(t)$ is the convolution of $x(t)$ and $\text{rect}\,(t)$, then what is $y(1)$?

(a) $\frac{e^2-1}{2e^3}$

(b) $\frac{e^2-1}{2e^2}$

(c) $\frac{e^2-1}{e^3}$

(d) $\frac{e-1}{2e^3}$

(e) $\frac{e^2+1}{2e^3}$

(f) $\frac{e^3-1}{2e^3}$

(g) $\frac{e^2-1}{2e}$

(h) $\frac{e^2-1}{e^2}$

(i) $\frac{e^2+1}{4e^3}$

(j) $\frac{e-1}{e^3}$

(k) $e^2 - e$

(l) None of these

Problem 25:

Suppose a periodic signal $f(t)$ with period π has Fourier series coefficients given by $F_n = (2+n^2)^{-1}$ for all integers n. When $f(t)$ is the input to an LTI system with impulse response $e^{-3t}u(t)$, the output $y(t)$ is periodic with Fourier series coefficients Y_n. What is Y_{-2}?

(a) $\frac{1/6}{3-4j}$

(b) $\frac{1}{3-4j}$

(c) $\frac{1/6}{3+4j}$

(d) $\frac{1/6}{3+2j}$

(e) $\frac{1/6}{3-2j}$

(f) $\frac{1/6}{3-2\pi j}$

(g) $\frac{1/6}{3+2\pi j}$

(h) $\frac{1/6}{3+\pi j}$

(i) $\frac{1/6}{3-\pi j}$

(j) 0

(k) 1/6

(l) None of these

Problem 26:

In the following four systems, the system's output $y(t)$ and the system's input $x(t)$ satisfy:

System 1: $y(t) = \frac{1}{1+x(t)}$.
System 2: $y(t) = \tan(x(t))$.
System 3: $y(t) = \tan(\sin(e^{x(t)}))$.
System 4: $y(t) = e^{1-x^2(t)}$.

Which of these 4 systems are stable?

(a) Only 3 and 4

(b) All of them

(c) Only 1,2,3

(d) Only 1

(e) Only 2

(f) Only 3

(g) Only 4

(h) Only 1,3,4

(i) Only 2,3,4

(j) None of 1,2,3,4

(k) Only 1 and 3

(l) None of these answers

Problem 27:

If $x(t) = \cos(t)(\cos(2t) + \cos(3t))$ is the input to an LTI system with frequency response $H(\omega)$, where $H(\omega) = 0$ if $|\omega/\pi| < 1$ and $H(\omega) = 1$ otherwise, then what is the output time signal?

(a) $\cos(4t)/2$

(b) $\cos(4t)$

(c) $\cos(3t)/2$

(d) $\cos(3t)$

(e) $\cos(2t)/2$

(f) $\cos(2t)$

(g) $\cos(t)/2$

(h) $\cos(t)$

(i) $\pi \cos(3t)$

(j) $\pi \cos(2t)$

(k) 0

(l) $\cos(2t) + \cos(3t)$

(m) $\pi(\cos(2t) + \cos(3t))$

(n) None of these

Problem 28:

What is the Fourier transform of $\text{rect}\,(t/5) \cdot \text{rect}\,(t/4) \cdot \text{rect}\,(t/3) \cdot \text{rect}\,(t/2) \cdot \text{rect}\,(t)$ when $\omega = \pi/2$?

(a) $2\sqrt{2}/\pi$

(b) $\sqrt{2}/\pi$

(c) $2/\pi$

(d) $2\sqrt{2}$

(e) $4\sqrt{2}/\pi$

(f) $4/\pi$

(g) $1/\pi$

(h) $2\sqrt{2}\pi$

(i) $2/5$

(j) $1/4$

(k) $120/\pi$

(l) None of these

Problem 29:

What is the bilateral Laplace transform $X(s)$ of $x(t) = u(1-2t)$ if the real part of s lies in the interval $(-4, -3)$?

(a) $-1/(s\sqrt{e^s})$

(b) $1/(s\sqrt{e^s})$

(c) $-1/(se^s)$

(d) $1/(se^s)$

(e) $1/s$

(f) $-1/s$

(g) $1/(s-1)$

(h) $1/(s-2)$

(i) $1/(s+1)$

(j) $1/(s+2)$

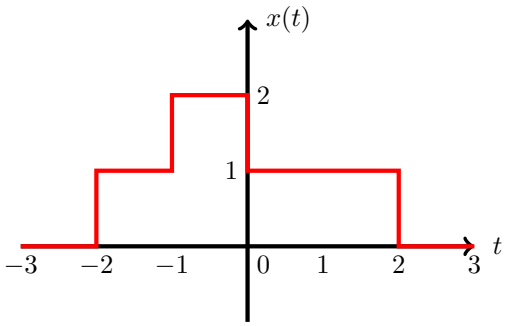
(k) e^{3s}/s

(l) e^{-s}

(m) None of these

Problem 30:

If $y(t)$ is the convolution of $x(t)$ with itself, where $x(t)$ is drawn below, then what is $y(\pi)$?



(a) $4 - \pi$

(b) π

(c) 2π

(d) $\pi - 3$

(e) $3 - \pi$

(f) $\pi + 1$

(g) 1

(h) 0

(i) $2 - \pi$

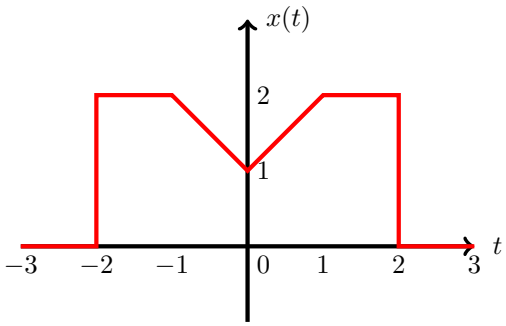
(j) $\pi - 2$

(k) $\pi - 1$

(l) None of these

Problem 31:

Suppose $x(t)$ (shown below) is the output of an LTI system when $2\delta(t-1)$ is the input. If $y(t)$ is the output from the LTI system when $u(t)$ is the intput, then what is $y(0)$?



(a) 5/2

(b) 7/4

(c) 1

(d) 5

(e) 7/2

(f) 1/3

(g) 1/8

(h) 2

(i) 5/4

(j) 7/8

(k) 1/2

(l) None of these

Problem 32:

What is the Fourier transform of $\cos(3t) + 2(1 - \delta(t-3))$?

(a) $\pi\delta(\omega-3) + \pi\delta(\omega+3) + 4\pi\delta(\omega) - 2e^{-3j\omega}$

(b) $\delta(\omega-3) + \delta(\omega+3) + 4\pi\delta(\omega) - 2e^{-3j\omega}$

(c) $2\pi\delta(\omega-3) + 2\pi\delta(\omega+3) + 4\pi\delta(\omega) - 2e^{-3j\omega}$

(d) $\pi\delta(\omega-3) - \pi\delta(\omega+3) + 4\pi\delta(\omega) - 2e^{-3j\omega}$

(e) $\pi\delta(\omega-3) + \pi\delta(\omega+3) + \delta(\omega) - 2e^{-3j\omega}$

(f) $\pi\delta(\omega-3) + \pi\delta(\omega+3) + 2\pi\delta(\omega) - 2e^{-3j\omega}$

(g) $\pi\delta(\omega-3) + \pi\delta(\omega+3) + 4\pi\delta(\omega-1) - 2e^{-3j\omega}$

(h) $\pi\delta(\omega-3) + \pi\delta(\omega+3) + 4\pi\delta(\omega) + 2e^{-3j\omega}$

(i) $\pi\delta(\omega-3) + \pi\delta(\omega+3) + 4\pi\delta(\omega) - e^{-3j\omega}$

(j) $\pi\delta(\omega-3) + \pi\delta(\omega+3) + 4\pi\delta(\omega) - 2e^{3j\omega}$

(k) None of these

Problem 33:

What is the value of the integral $\int_{-\infty}^{\infty} \sin^3(t/8)\,(\delta(t-\pi)+\delta(t+\pi))\,dt$?

(a) 0

(b) 1

(c) -1

(d) $1/8$

(e) $-1/8$

(f) 2

(g) $\sqrt{3}/2$

(h) $\sqrt{3}$

(i) $2\sqrt{2}$

(j) $-2\sqrt{2}$

(k) -2

(l) None of these

Problem 34:

What is the convolution of $\sum_{n=-\infty}^{\infty} \delta(t-4n)$ and $\sin(2\pi t) \cdot \text{rect}\left(t-\frac{1}{2}\right)$ when $t = 76.75$?

(a) -1

(b) 1

(c) $-1/2$

(d) $1/2$

(e) $\sqrt{3}/2$

(f) $-\sqrt{3}/2$

(g) $\sqrt{2}/2$

(h) $-\sqrt{2}/2$

(i) 0

(j) 2

(k) -2

(l) None of these

Problem 35:

Suppose an LTI sytem has frequency response $H(\omega) = \omega \cdot \text{rect}\,(\omega/10)$. If the input to the system is the complex signal $\sin(\pi t) + j\cos(\pi t)$ then what is the output at time $t = 0.25$?

(a) $-\pi(1+j)/\sqrt{2}$

(b) $\pi(1+j)/\sqrt{2}$

(c) $\pi(1-j)/\sqrt{2}$

(d) $\pi(-1+j)/\sqrt{2}$

(e) $-\pi(1+j)$

(f) $\pi(1+j)$

(g) $\pi(1-j)$

(h) $\pi(-1+j)$

(i) $-(1+j)/\sqrt{2}$

(j) $(1+j)/\sqrt{2}$

(k) $(1-j)/\sqrt{2}$

(l) $(-1+j)/\sqrt{2}$

(m) None of these

Problem 36:

In the following four systems, the system's output $y(t)$ and the system's input $x(t)$ satisfy:

System 1: $y(t) = \int_{t}^{t+1} x(\tau)d\tau$.
System 2: $y(t) = \int_{t-1}^{t} x(\tau)d\tau$.
System 3: $y(t) = \int_{-\infty}^{t} x(\tau)d\tau$.
System 4: $y(t) = \int_{-\infty}^{t+1} x(\tau)d\tau$.

Which of these 4 systems are both linear and time-invariant?

(a) All of them

(b) Only 4

(c) Only 1 and 2

(d) Only 1

(e) Only 2

(f) Only 3

(g) Only 2,3,4

(h) Only 1,3,4

(i) Only 1,2,4

(j) Only 1,2,3

(k) None of 1,2,3,4

(l) Only 3 and 4

(m) None of these answers