Assignment 06

The due date for submitting this assignment has passed. Due on 2017-09-08, 23:59 IST.
As per our records you have not submitted this assignment.

Note: For multiple-choice questions, square boxes for choices imply that one or more choices could be correct. You will get full marks only when all the correct answers are chosen. Radio buttons (circles) for choices imply that only one choice is correct. Note that the text for each choice appears either on the right or below the corresponding button. For the short-answer questions, you need to enter the answer in a text box. Please take care to enter the answer without spaces because the server simply checks for exact text match. Please ask questions on the forum if the required format for answers is confusing.

All the best.

1) Let \( f(t) = e^{-at} (\cos^2(\omega_c t) - \sin^2(\omega_c t))u(t) \). What is its Fourier Transform \( F(j\omega) \)?

\[
F(j\omega) = \frac{j2\omega_c}{(a+j\omega)^2+4\omega_c^2}
\]

No, the answer is incorrect.

Score: 0

Accepted Answers:

\[
\frac{j\omega+a}{(a+j\omega)^2+4\omega_c^2}
\]

2) Let \( x(t) \) be as shown in the figure below. What is its Fourier transform?

\[
x(t)
\]

\[
\frac{A_0}{\omega T} \left( \omega T \cos(\omega T) + \sin(\omega T) \right)
\]
No, the answer is incorrect.

Score: 0

Accepted Answers:

3) If \( f^*(t) \) has Fourier Transform \( F(j\omega) \), what is the Fourier Transform of \( f(t) \) (here \( * \) denotes the complex conjugate)?

- \( F(-j\omega) \)
- \( F^*(j\omega) \)
- \( F(-j\omega) \)
- \( F(+j\omega) \)

No, the answer is incorrect.

Score: 0

Accepted Answers:

4) If \( f(t) \) has Fourier Transform \( F(j\omega) \) then what is the Fourier Transform of \( e^{j\omega t} f(t+\tau) \)?

- \( e^{j\omega t} F(j(\omega + \omega_c)) \)
- \( e^{-j\omega t} F(j(\omega - \omega_c)) \)
- \( e^{-j(\omega-2\omega_c)t} F(j(\omega + \omega_c)) \)
- \( e^{j(\omega-2\omega_c)t} F(j(\omega - \omega_c)) \)

No, the answer is incorrect.

Score: 0

Accepted Answers:

5) The Fourier Transform of a signal is as shown below \( H(j\omega) \)

If the energy of the above signal is of the form \( \frac{a}{b\pi} \) where \( a \) and \( b \) are coprime integers, what is the value of \( a + b \).

No, the answer is incorrect.

Score: 0
27/07/2020  Networks and systems - - Unit 26 - Week 6: Assignment

**Week 9: Laplace Transform IV**

**Week 9: Laplace Transform V**

**Week 9: Assignment**

**Week 10: Laplace Transform VI**

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**Week 10: Laplace Transform VIII**

**Week 10: Assignment**

**Week 11: Application of Laplace Transforms I**

**Week 11: Application of Laplace Transforms II**

**Week 11: Application of Laplace Transforms III**

**Week 11: Assignment**

**Week 12: Application of Laplace Transforms IV**

**Week 12: Application of Laplace Transforms V**

**Week 12: Assignment**

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**Accepted Answers:**

*(Type: String)* 5

6) If $f(t)$ has Fourier transform $F(j\omega)$, then what is the Fourier transform of $F(t)$?

- $2\pi f(-j\omega)$
- $2\pi f(j\omega)$
- $\frac{1}{2\pi} f(-j\omega)$
- $\frac{1}{2\pi} f(j\omega)$

*No, the answer is incorrect.*
*Score: 0*

**Accepted Answers:**

$2\pi f(-j\omega)$

7) What is the Fourier transform for the signal $f(t) = e^{-|t|}$?

- $F(j\omega) = \frac{1}{\omega^2 + 1}$
- $F(j\omega) = \frac{2}{\omega^2 + 1}$
- $F(j\omega) = \frac{j\omega}{\omega^2 + 1}$
- $F(j\omega) = \frac{2j\omega}{\omega^2 + 1}$

*No, the answer is incorrect.*
*Score: 0*

**Accepted Answers:**

$F(j\omega) = \frac{2}{\omega^2 + 1}$

8) If Fourier transform of $f(t)$ is $F(j\omega)$, what is the Inverse Fourier Transform of $j\frac{d}{d\omega} F(j\omega)$?

- $tf(t)$
- $-tf(t)$
- $tf(-t)$
- $-tf(-t)$

*No, the answer is incorrect.*
*Score: 0*

**Accepted Answers:**

$tf(t)$

9) If the signal $f(t) = e^{-\frac{t}{2}} u(t)$ is passed through the filter shown below, what is the ratio of output energy to input energy?

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https://onlinecourses-archive.nptel.ac.in/noc17_ee15/unit?unit=206&assessment=207 3/4
No, the answer is incorrect.
Score: 0
Accepted Answers:
\[
\frac{1}{2}
\]