You can preview this quiz, but if this were a real attempt, you would be blocked because:

This quiz is not currently available

Question **1**

Not yet answered

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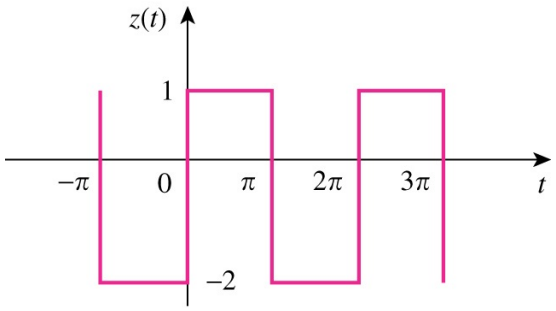
Which statement is TRUE for $z(t)$?



Select one:

- a. It has $a_0 = -0.5$ and $a_n = 0$
- b. All Fourier series coefficients of $z(t)$ are nonzero
- c. It has $b_n = 0$ because it is an even symmetry function
- d. It has $a_0 = 0$ and $a_n = 0$ because it is an odd symmetry function

Question **2**

Not yet answered

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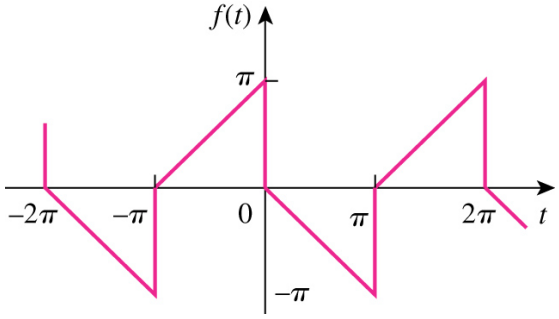
Which of the following statements are TRUE for $f(t)$?



i. $f(t)$ is a half-wave symmetry function

ii. $f(t)$ has $a_n = 0$ for all of positive integer n

iii. $f(t)$ has $a_0 = 0$

iv. The coefficients a_n and b_n for $f(t)$ are zeros for even positive integer n

Select one:

- a. ii and iii
- b. i, iii and iv
- c. i and iii
- d. i and ii

Question **3**

Not yet answered

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A full-wave rectifier is used to convert _____. The DC component of a full-wave rectified voltage signal is equal to _____.

Select one:

a. AC to DC signals, $\frac{V_{peak}}{\pi}$

b. DC to DC signals, $\frac{2V_{peak}}{\pi}$

c. DC to DC signals, $\frac{V_{peak}}{\pi}$

d. AC to DC signals, $\frac{2V_{peak}}{\pi}$

Question **4**

Not yet answered

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If the complex Fourier series of $f(t)$ is

$$f(t)=\sum_{n=-\infty}^{\infty}\frac{1}{1-jn}e^{jnt},$$

what is the corresponding values of a_n and b_n?

Select one:

a. $a_n=\frac{2}{\sqrt{1+n^2}}, b_n=-\frac{2n}{\sqrt{1+n^2}}$

b. $a_n=\frac{1}{\sqrt{1+n^2}}, b_n=-\frac{n}{\sqrt{1+n^2}}$

c. $a_n=\frac{1}{\sqrt{1+n^2}}, b_n=\frac{n}{\sqrt{1+n^2}}$

d. $a_n=\frac{2}{\sqrt{1+n^2}}, b_n=\frac{2n}{\sqrt{1+n^2}}$

Question **5**

Not yet answered

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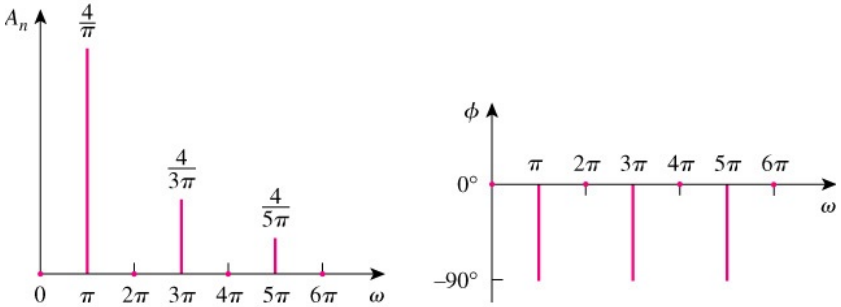
Which Fourier series represents the following amplitude and phase spectra?



Select one:

a. $f(t)=\sum_{n=1}^{\infty}\frac{4}{(2n-1)\pi}\sin nt$

b. $f(t)=\sum_{n=1}^{\infty}\frac{4}{(2n-1)\pi}\sin(2n-1)\pi t$

c. $f(t)=\sum_{\substack{n=1\\ n\text{odd}}}^{\infty}\frac{4}{n\pi}\cos n\pi t$

d. $f(t)=\sum_{n=1}^{\infty}\frac{4}{(2n-1)\pi}\cos[(2n-1)\pi t-\tan^{-1}n\pi]$

Question **6**

Not yet answered

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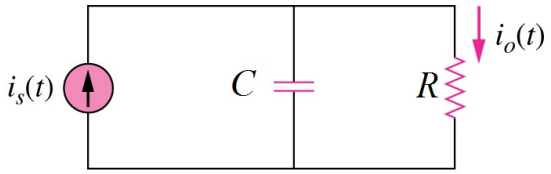
Consider the following circuit.



Determine the output current if R = 1 Ω, C = 1 F and the input current is

$i_s(t)=0.5+\sum_{n=1}^{\infty}\frac{\cos(nt+180°)}{4n^2-1}$ A.

Select one:

a. $i_o(t)=\sum_{n=1}^{\infty}\frac{\cos(nt+180°-\tan^{-1}n\pi)}{(4n^2-1)\sqrt{4+n^2\pi^2}}$ A

b. $i_o(t)=0.5+\sum_{n=1}^{\infty}\frac{\cos(nt+180°-\tan^{-1}n)}{(4n^2-1)\sqrt{1+n^2}}$ A

c. $i_o(t)=0.5+\sum_{n=1}^{\infty}\frac{\cos(nt+180°-\tan^{-1}n\pi)}{(4n^2-1)\sqrt{4+n^2\pi^2}}$ A

d. $i_o(t)=\sum_{n=1}^{\infty}\frac{\cos(nt+180°-\tan^{-1}n)}{(4n^2-1)\sqrt{1+n^2}}$ A

Question **7**

Not yet answered

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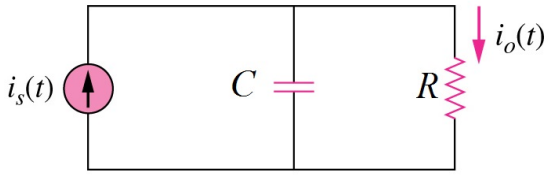
Consider the following circuit.



In the Fourier series AC analysis, what is the relationship between the output and the input currents?

Select one:

a. $I_o=\frac{jn\omega_0 C}{R+jn\omega_0 C}I_s$

b. $I_o = \dfrac{R}{R + jn\omega_0 C} I_s$

c. $I_o = \dfrac{1}{1 + jn\omega_0 RC} I_s$

d. $I_o = \dfrac{jn\omega_0 RC}{1 + jn\omega_0 RC} I_s$

Question **8**

Not yet answered

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Given the voltage across a 5 Ω resistor is

$$v(t) = 2 - \sum_{n=1}^{\infty} \frac{4}{n\pi} \sin 2nt \text{ V.}$$

Choose the best value to estimate the average power absorbed by the resistor.

Select one:

a. 0.2 W

b. 14 W

c. 5 W

d. 1 W

Question **9**

Not yet answered

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If $i(t) = 1 - \sum_{n=1}^{\infty} \frac{2}{4n^2 - 1} \cos n\pi t$ A,

calculate the I_{rms} using the Fourier series components up to the 3rd harmonics.

Select one:

a. 2.0142 A

b. 1.0533 A

c. 1.1103 A

d. 0.8940 A

Question **10**

Not yet answered

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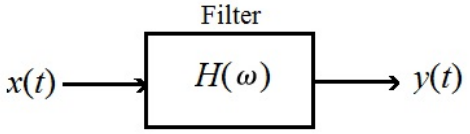
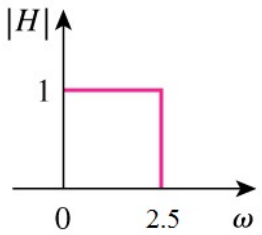
Assume that the filter in Figure (a) is ideal and its transfer function frequency response is shown in Figure (b).



(a)



(b)

What is the output *y*(*t*) if the Fourier series of the input is

$x(t) = 1 - \sum_{n=1}^{\infty} \frac{2}{n\pi} \sin nt$?

Select one:

a. $y(t) = 1 - \sum_{n=1}^{3} \frac{2}{n\pi} \sin nt$

b. $y(t) = 1 - \frac{2}{\pi} \sin t - \frac{1}{\pi} \sin 2t$

c. $y(t) = 1 - \frac{2}{\pi} \sin t - \frac{1}{\pi} \sin 2t - \frac{2}{2.5\pi} \sin 2.5t$

d. $y(t) = -\frac{2}{2.5\pi} \sin 2.5t$

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