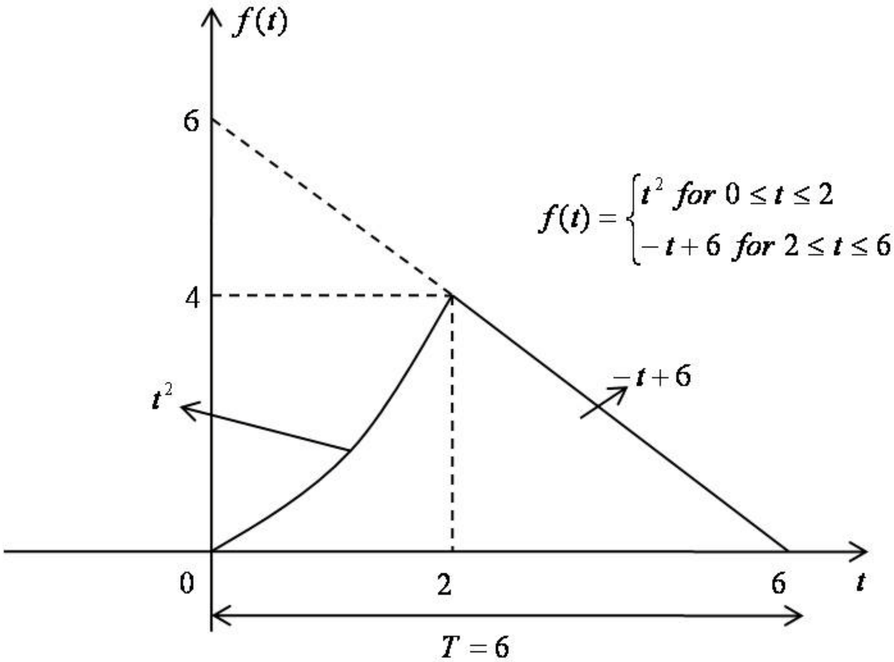
Multiple Choice Test

Chapter 11.02
Continuous Fourier Series

1. Which of the following is an "even" function of t?
   (A) t^2
   (B) $t^2 - 4t$
   (C) $\sin(2t) + 3t$
   (D) $t^3 + 6$

2. A "periodic function" is given by a function which
   (A) has a period $T = 2\pi$
   (B) satisfies $f(t+T) = f(t)$
   (C) satisfies $f(t+T) = -f(t)$
   (D) has a period $T = \pi$

3. Given the following periodic function, $f(t)$.



The coefficient a_0 of the continuous Fourier series associated with the above given function $f(t)$ can be computed as

(A) $\frac{8}{9}$
(B) $\frac{16}{9}$
(C) $\frac{24}{9}$
(D) $\frac{32}{9}$

4. For the given periodic function $f(t)=\begin{cases} 2t \text{ for } 0 \le t \le 2 \\ 4 \text{ for } 2 \le t \le 6\ (=T) \end{cases}$. The coefficient b_1 of the continuous Fourier series associated with the given function $f(t)$ can be computed as

(A) -75.6800
(B) -7.5680
(C) -6.8968
(D) -0.7468

5. For the given periodic function $f(t) = \begin{cases} 2t \text{ for } 0 \le t \le 2 \\ 4 \text{ for } 2 \le t \le 6 \end{cases}$ with a period $T = 6$. The Fourier coefficient a_1 can be computed as

(A) -9.2642
(B) -8.1275
(C) -0.9119
(D) -0.5116

6. For the given periodic function $f(t) = \begin{cases} 2t \text{ for } 0 \le t \le 2 \\ 4 \text{ for } 2 \le t \le 6 \end{cases}$ with a period $T = 6$ as shown in Problem 5. The complex form of the Fourier series can be expressed as $f(t) = \sum_{k=-\infty}^{\infty} \widetilde{C}_k e^{ikw_0 t}$. The complex coefficient $\widetilde{C}_1$ can be expressed as

(A) $0.4560 + 0.3734i$
(B) $0.4560 - 0.3734i$
(C) $-0.4560 + 0.3734i$
(D) $0.3734 - 0.4560i$