Unit 2 - Assignment Zero

Assignment 0

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-01-27, 23:59 IST.

1) If $\delta(t)$ is unit-impulse and $\sum_{k=-\infty}^{\infty}\delta(t-kT)=\sum_{n=-\infty}^{\infty}a_n e^{-j\frac{2\pi n}{T}t}$, then a_n is — 1 point

- $2T$
- $1/T$
- T
- $1/2T$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$1/T$

2) If $x(t)$ has the Fourier transform $X(f)$ then the Fourier transform of $x(t-d)e^{-j2\pi f_c t}$ is — 1 point

- $X(f-f_c)e^{-j2\pi fd}$
- $X(f+f_c)e^{-j2\pi fd}$
- $X(f-f_c)e^{j2\pi fd}$
- $X(f+f_c)e^{j2\pi fd}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$X(f+f_c)e^{-j2\pi fd}$

3) If $x(t)$ has the Fourier transform $X(f)$ and $x(t)=\begin{cases}1 & |t|<T/4\\ 0 & Otherwise\end{cases}$, then $X(f)$ is (assume $sinc(x)=\frac{sin\pi x}{\pi x}$) — 1 point

- $\frac{T}{2}sinc(fT)$
- $\frac{T}{2}sinc(fT/2)$
- $Tsinc(fT)$
- $Tsinc(fT/2)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\frac{T}{2}sinc(fT/2)$

4) Assuming $sinc(x)=\frac{sin\pi x}{\pi x}$. Find $\int_{-\infty}^{\infty}sinc^2(x)dx=$ — 1 point

- 1
- 2
- 0.5
- 0

No, the answer is incorrect.
Score: 0
Accepted Answers:
1

5) The output *y(t)* of the following linear-time invariant (LTI) system with impulse response *h(t)* is — 1 point

- $j\sin(\omega_0 t)$
- $-\sin(\omega_0 t)$
- $-\cos(\omega_0 t)$
- $j\cos(\omega_0 t)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$-\cos(\omega_0 t)$

6) If $y(t)=x(t)*h(t)$ and $g(t)=x(2t)*h(2t)$ where * represents the convolution operation, then — 1 point

- $g(t)=0.5\times y(2t)$
- $g(t)=2\times y(2t)$
- $g(t)=2\times y(0.5t)$
- $g(t)=0.5\times x(0.5t)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$g(t)=0.5\times y(2t)$

7) If the Nyquist rate of the signal $x(t)$ is ω_0. The Nyquist rate of the signal $(x(t)\cos\omega_0 t)^2$ is — 1 point

- $6\omega_0$
- $3\omega_0$
- $2\omega_0$
- $4\omega_0$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$6\omega_0$

8) If * represents the convolution operation, then $(\sum_{k=-\infty}^{\infty}a_k\delta(t-kT))*p(t)=$ — 1 point

- $\sum_{k=-\infty}^{\infty}a_k\delta(t-kT)p(t)$
- $\sum_{k=-\infty}^{\infty}a_k p(t-kT)$
- $\sum_{k=-\infty}^{\infty}a_k p(t-kT)\delta(t)$
- $\sum_{k=-\infty}^{\infty}a_k p(t)\delta(t)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\sum_{k=-\infty}^{\infty}a_k p(t-kT)$

9) If $x(t)$ has the Fourier transform $X(f)$ and $x(t)$ is real then — 1 point

- $|X(f)|=|X(-f)|\&\angle X(f)=-\angle X(-f)$
- $|X(f)|=|X(-f)|\&\angle X(f)=\angle X(-f)$
- $|X(f)|=|X(1/f)|\&\angle X(f)=-\angle X(1/f)$
- $|X(f)|=|X(1/f)|\&\angle X(f)=\angle X(1/f)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$|X(f)|=|X(-f)|\&\angle X(f)=-\angle X(-f)$

10) If $x[n]=x_s(nT)$ where $x[n]$ and $x_s(t)$ are the discrete-time and continuous-time signals respectively and the Fourier transform of $x[n]$ is $X(\Omega)$ and the Fourier transform of $x_s(t)$ is $X_s(\omega)$, then — 1 point

- $X(\Omega T)=X_s(\omega)$
- $X(\Omega)=X_s(\omega T)$
- $X(\Omega)=X_s(\omega/T)$
- $X(\Omega/T)=X_s(\omega)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$X(\Omega)=X_s(\omega T)$

11) The energy E and power P of a complex signal $x[n]$ are — 1 point

- $E=\sum_{n=-\infty}^{\infty}x[n]x^*[n]$ and $P=\lim_{N\to\infty}(\sum_{n=-N}^{N}|x[n]|^2/(2N+1))$
- $E=\sum_{n=-\infty}^{\infty}x[n]x[n]$ and $P=\lim_{N\to\infty}(\sum_{n=-N}^{N}|x[n]|^2/(2N+1))$
- $P=\sum_{n=-\infty}^{\infty}x[n]x^*[n]$ and $E=\lim_{N\to\infty}\sum_{n=-N}^{N}|x[n]|^2/(2N+1)$
- $P=\sum_{n=-\infty}^{\infty}x[n]x[n]$ and $E=\lim_{N\to\infty}(\sum_{n=-N}^{N}|x[n]|^2/(2N+1))$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$E=\sum_{n=-\infty}^{\infty}x[n]x^*[n]$ and $P=\lim_{N\to\infty}(\sum_{n=-N}^{N}|x[n]|^2/(2N+1))$

12) The power of a transmitter is 3dBm and the loss in the communication link between a transmitter and receiver is – 2 dB, the received power is — 1 point

- 1.3mW
- 10 mW
- 1 mW
- 10 µW

No, the answer is incorrect.
Score: 0
Accepted Answers:
1.3mW

13) A typical example of a countably infinite and uncountable set is — 1 point

- Set of integers and set of real numbers
- Set of real numbers and set of integers
- Set of complex numbers and set of real numbers
- Set of real numbers and set of complex numbers

No, the answer is incorrect.
Score: 0
Accepted Answers:
Set of integers and set of real numbers

14) $e^{j\omega t}sin\omega tcos2\omega t=$ — 1 point

- $\frac{(e^{3j\omega t}-e^{-2j\omega t}-e^{2j\omega t}+1)}{4j}$
- $\frac{(e^{3j\omega t}+e^{-2j\omega t}-e^{2j\omega t}+1)}{4j}$
- $\frac{(e^{3j\omega t}+e^{-2j\omega t}+e^{2j\omega t}+1)}{4j}$
- $\frac{(e^{3j\omega t}-e^{-2j\omega t}-e^{2j\omega t}-1)}{4j}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\frac{(e^{3j\omega t}-e^{-2j\omega t}-e^{2j\omega t}+1)}{4j}$

15) If $\omega=\frac{2\pi}{T}$ then $\int_0^T sin\omega tcos2\omega t dt=$ — 1 point

- 0
- T
- 2T
- T/2

No, the answer is incorrect.
Score: 0
Accepted Answers:
0