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Unit 4 - Week-1 Introduction to Signals and Systems, Signal Classification

Assignment-1

The due date for submitting this assignment has passed. **Due on 2020-02-12, 23:59 IST.**

Assignment submitted on 2020-01-29, 11:46 IST

1) The signal $e^t u(t)$ belongs to which of the following classes of signals?   *1 point*
   i Analog signals
   ii Energy signals
   iii Power Signals
   iv Deterministic Signals

   ○ Only i and iv

   ○ Only i, ii, and iv

   ◉ Only i, iii, and iv

   ○ Only iii, iv

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   Only i and iv

2) The value of $\int_{-\infty}^{\infty} \sin(t)\delta'(t)dt$ is   *1 point*

   ○
   0
   ○
   -1
   ○
   1

○

∞

No, the answer is incorrect.
Score: 0

Accepted Answers:
-1

3) The signal $x(n) = e^{j\frac{2\pi kn}{N}}$, where k is an integer belongs to which of the following classes of signals?   **1 point**

   i Discrete time signals
   ii Power Signals
   iii Energy Signals
   iv Periodic Signals

○ i, ii, iii and iv

○ Only i, iii, and iv

○ Only ii, iii and iv

○ Only i, ii and iv

No, the answer is incorrect.
Score: 0

Accepted Answers:
Only i, ii and iv

4) An LTI system has to satisfy   **1 point**

○ Only additivity and homogeneity properties

○ Only homogeneity and time-invariance properties

○ Only additivity and time-invariance properties

◉ Additivity, homogeneity and time-invariance properties

Yes, the answer is correct.
Score: 1

Accepted Answers:
Additivity, homogeneity and time-invariance properties

5)The eigenfunction of an LTI system is of the form   **1 point**

○
$\cos(2\pi f_0 t)$

○
$\sin(2\pi f_0 t)$

○
$e^{\alpha t}$

○
$e^{-\beta t}u(t)$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$e^{\alpha t}$

6) The signal $x(t) = \frac{\sin(5t)}{\pi t}$ is   **1 point**

○

An energy signal with energy 5π

○
A power signal with power 10π

○
An energy signal with energy $\frac{5}{\pi}$

○ None of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
An energy signal with energy $\frac{5}{\pi}$

7) The odd component of the complex exponential signal $e^{j\omega_o t}$ is   **1 point**

○

$\sin(\omega_o t)$

○

$\cos(\omega_o t)$

○

$j\sin(\omega_o t)$

○

$-\cos(\omega_o t)$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$j\sin(\omega_o t)$

8) Consider the signal $x(t) = 1 - 2|t|$ for $|t| \leq 1$ and 0 otherwise. Let   **1 point**
$y(t) = x(4 - t)$. Which of the following statements is true?

○

$y(t)$ is increasing in the interval $4 \leq t \leq 5$

○

$\frac{d}{dt}y(t) = 2$ for $3 \leq t < 4$

○

$y(t)$ is decreasing in the interval $-4 \leq t \leq -5$

○

Peak of $y(t)$ occurs at $t = 4.5$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\frac{d}{dt}y(t) = 2$ *for* $3 \leq t < 4$

9) The signal $\cos^2\left(\frac{\pi}{8}n\right)$ is   **1 point**

○

periodic with fundamental period $N = 8$

○

periodic with fundamental period $N = 4$

○

periodic with fundamental period $N = 16$

○ aperiodic

No, the answer is incorrect.
Score: 0

10) The value of $\int_{-\infty}^{\infty} e^{-\beta t}\delta(\tau - \alpha t)dt$, for $\alpha > 0$, is

1 point

○

$-\dfrac{\beta}{\alpha}e^{-\beta\alpha\tau}$

○

$-\beta\alpha e^{-\frac{\beta}{\alpha}\tau}$

○

$\dfrac{\beta}{\alpha}e^{-\beta\tau}$

○

$\dfrac{1}{\alpha}e^{-\frac{\beta}{\alpha}\tau}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\dfrac{1}{\alpha}e^{-\frac{\beta}{\alpha}\tau}$