Subject: Control Theory

Problem 1:

Tell, what kind of signal which is shown below?

Consider the output signal signature of sampling block in a being sinusoidal, and because the following,

At the sampling rate is greater or the Nyquist-rate(twice) or as a proportional coefficient sampling rate(of the input signal), in which it gives by $\frac{1}{\Delta t}$ ____

At the transformation, the sampling interval is the sampling time period. Mathematically this implies Δt ____

At the sampling rate, the output signal is sinusoidal in strongly related to ____

At the transformation, the output signal is strongly related to ____

At the sampling period, the output signal is strongly related to sampling ____

At the sampling period, the output signal is strongly related to ____

Tell, that all the given statements frequency range, the following which, which frequency is true.

$f_{sig} \in [0, 0.5f_{samp}]$; $f \in [0.5f_{samp}, f_{samp}]$

$f \in [f_{samp}, 1.5f_{samp}]$; $f \in [1.5f_{samp}, 2f_{samp}]$

Power frequency: $f_{power} = 50\,Hz$

$f \in [2f_{samp}, 2.5f_{samp}]$; $f \in [2.5f_{samp}, 3f_{samp}]$

Power frequency frequency: $f_{power} = 50\,Hz$

$f_{samp} = 1\,Hz$

Power frequency: $f_{power} = 50\,Hz$

$f_{samp} = 1\,Hz$

Power frequency: $f_{power} = 50\,Hz$

Sampling frequency	Frequency range
$f_{samp} = 1\,Hz$	$f \in [0, 0.5]$
$f_{samp} = 1\,Hz$	$f \in [0.5, 1]$
$f_{samp} = 1\,Hz$	$f \in [1, 1.5]$
$f_{samp} = 1\,Hz$	$f \in [1.5, 2]$
$f_{samp} = 1\,Hz$	$f \in [2, 2.5]$
$f_{samp} = 1\,Hz$	$f \in [2.5, 3]$

Sampling time:

Sampling time, $T_s = \frac{1}{f_{samp}}$

$T_s = \frac{1}{50}$

$T_s = 0.02\,s$

Sampling frequency, $f_{samp} = 50\,Hz$

Sampling time, $T_s = 0.02\,s$

Sampling time:

Sampling frequency, $f_{samp} = 50\,Hz$

$f_{samp} = 50\,Hz$

$f_{samp} = 50\,Hz$

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