SAS QUIZ-1 SOLUTIONS

Sol(1)

(5X1) POINTS

Energy of signal
$$x(t)$$
, $E = \int_{-\infty}^{\infty} |x(t)|^2 dt$

Power of signal $x(t)$, $P = \begin{cases} \frac{1}{T_o} \int_{0}^{T_o} |x(t)|^2 dt \\ \int_{0}^{T_o} \int_{0}^{T_o} |x(t)|^2 dt \end{cases}$

For Periodic signal

$$\begin{cases} \lim_{t \to \infty} \frac{1}{T_o} \int_{0}^{T_o} |x(t)|^2 dt \\ \lim_{t \to \infty} \frac{1}{T_o} \int_{0}^{T_o} |x(t)|^2 dt \end{cases}$$

For Non-Periodic signal

- (a) No evaluation
- (b) Infinite extension signals with amplitude/Peak amplitude decreasing in nature. $\rightarrow x(t) = e^{-\alpha |t|}$ Enesigy Signal
- Infinite extension signals with leak amplitude decireasing in nature. Hence Energy signal x(t) = Sa(t) or x(t) = sinc(t)
- Infinite extension signals with Peak amplitude decoreasing in nature. Hence Energy Signal $x(t) = -e^{at} \cdot u(t)$; a>0
- (e) Infinite extension signals with constant Peak amplitude/ constant amplitude. Hence Power Signal $\chi(t) = \sin(t)$
- (f) Infinite extension signals with Peak amplitude increasing in notwie. Hence Neither Energy Non Power Signal

(4 POINTS)

Given signal,
$$x(t) = \sin^2(4\pi t)$$

$$= \left(\frac{1}{2}\right) - \frac{\cos(8\pi t)}{2}$$
Pesilodic Pesilodic Signal Signal (AC Signal) $w_0 = 8\pi$

$$\therefore FTP \text{ of Signal } x(t) = T_0 = \frac{2\pi}{w_0} = \frac{2\pi}{8\pi} = \left(\frac{1}{4}\right) \sec c$$

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