

Bài 1.

$$x(n) = x\left(\frac{n}{f_s}\right)$$

$$x(n) = x\left(1 \pm \frac{n}{f_s}\right)$$

$$= x\left(1 \pm \frac{n}{1000}\right)$$

$$= 4 + \cos\left(\frac{\pi n}{4} - \frac{\pi}{4}\right) - 3 \cos\left(\frac{2\pi n}{3}\right)$$

$$X(z) = \mathcal{Z}\{x(n)\}$$

$$Y(z) = \mathcal{Z}\{y(n)\}$$

$$X(z) = \frac{4}{1-z^{-1}} +$$

$$x(n) = 4 + \frac{\sqrt{2}}{2} \cos\left(\frac{\pi n}{4}\right) + \frac{\sqrt{2}}{2} \sin\left(\frac{\pi n}{4}\right) - 3 \cos\left(\frac{2\pi n}{3}\right)$$

Với  $|z| > 1$ :

$$\Rightarrow X(z) = \frac{4}{1-z^{-1}} + \frac{\sqrt{2}}{2} \frac{1 - (\pi/4)z^{-1}}{1 - \sqrt{2}z^{-1}}$$

B6'

$$\Rightarrow X(z) = \frac{4}{1-z^{-1}} + \frac{\sqrt{2}}{2} \frac{1 - \sqrt{2}z^{-1}}{1 - \sqrt{2}z^{-1} + z^{-2}}$$

$$+ \frac{\sqrt{2}}{2} \frac{1 - \sqrt{2}z^{-1}}{1 - \sqrt{2}z^{-1} + z^{-2}} - 3 \frac{1 + \frac{\sqrt{2}}{2}z^{-1}}{1 + \sqrt{2}z^{-1} + z^{-2}}$$

$$= \frac{4}{1-z^{-1}} + \frac{\sqrt{2} - z^{-1}}{1 - \sqrt{2}z^{-1} + z^{-2}} - \frac{3 + \frac{\sqrt{2}}{2}z^{-1}}{1 + \sqrt{2}z^{-1} + z^{-2}}$$

DỨC TRƯỜNG

$$Y(z) = H(z) \cdot X(z)$$

$$= \frac{1}{3} (X(z) + X(z)z^{-1} + X(z)z^{-2})$$

$$\Rightarrow y(n) = \frac{1}{3} [x(n) + x(n-1) + x(n-2)]$$

$$= 4 + \frac{1}{3} \left[ \cos\left(\frac{\pi n}{4} - \frac{\pi}{4}\right) + \cos\left(\frac{\pi n}{4} - \frac{\pi}{2}\right) + \cos\left(\frac{\pi n}{4} - \frac{3\pi}{4}\right) \right]$$

$$+ \frac{1}{3} \left[ \cos\left(\frac{2\pi}{3}n\right) + \cos\left(\frac{2\pi}{3}n - \frac{2\pi}{3}\right) + \cos\left(\frac{2\pi}{3}n - \frac{4\pi}{3}\right) \right]$$

$$\Rightarrow y(n) = 4 + \frac{1}{3} \left[ \cos\left(\frac{\pi n}{4}\right) + \sqrt{2} \sin\left(\frac{\pi n}{4}\right) \right]$$

$$\text{Vậy } y(t) = 4 + \frac{1}{3} [\cos(250\pi t) + \sqrt{2} \sin(250\pi t)]$$