

آذر

۹۹۳۰۱۴۳

پایخ عرقه سری سوم

زهره ملای مهدی آبار

کانیوشن (i)

$$u[n] = \delta[n] + 2\delta[n+1]$$

$$h[n] = 2\delta[n+1] - \delta[n-1]$$

$$u[n+1] \otimes h[n-1]$$

$$u[n+1] = \delta[n+1] + 2\delta[n+2]$$

$$h[n-1] = 2\delta[n] - \delta[n-2]$$

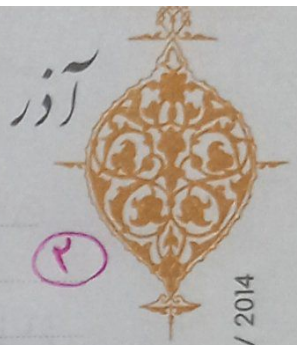
$$u[n+1] \otimes h[n-1] = \sum_{k=-\infty}^{\infty} u[k+1] h[n-1]$$

$$= \sum_{k=-\infty}^{\infty} (\delta[k+1] + 2\delta[k+2]) (2\delta[n] - \delta[n-2])$$

$$= (2\delta[n] - \delta[n-2]) \sum_{k=-\infty}^{\infty} \delta[k+1] + 2\delta[k+2]$$

$$(2\delta[n] - \delta[n-2]) \sum_{k=-\infty}^{\infty} \delta[k+1] + (2\delta[n] - \delta[n-2])$$

$$\sum_{k=-\infty}^{\infty} 2\delta[k+2]$$



(۲)

$$8 \quad h[n] = r^n u[-n+1]$$

$$9 \quad g[n] = \left(\frac{1}{r}\right)^{n-1} (u[n] - u[n-1])$$

$$10 \quad h_k[n] = r^n u[-n+1]$$

$$11 \quad g[k] = \left(\frac{1}{r}\right)^{k-1} [u[k] - u[k-1]]$$

$$12 \quad y[n] = \sum_{k=-\infty}^{\infty} g[k] h[n-k]$$

$$13 \quad y[n] = \sum_{k=-\infty}^{\infty} \left(\frac{1}{r}\right)^{k-1} [u[k] - u[k-1]] r^n u[-n+1]$$

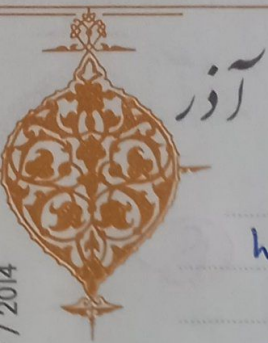
$$14 \quad = r^n u[-n+1] \sum_{k=-\infty}^{\infty} \left(\frac{1}{r}\right)^{k-1} u[k]$$

$$15 \quad - r^n u[-n+1] \sum_{k=-\infty}^{\infty} \left(\frac{1}{r}\right)^{k-1} u[k-1]$$

$$16 \quad = r^n u[-n+1] \sum_{k=0}^{\infty} 1 \times \left(\frac{1}{r}\right)^{k-1} - r^n u[-n+1] \sum_{k=1}^{\infty} 1 \times \left(\frac{1}{r}\right)^{k-1}$$

17

18



آذر



$$h(t) = e^{t+1} (u(t) - u(t-\Delta))$$

$$u(t) = r e^{t-1} u(-t)$$

$$y(t) = \int_{-\infty}^{\infty} u(\lambda) h(t-\lambda) d\lambda$$

$$y(t) = \int_{-\infty}^{\infty} r e^{\lambda-1} u(-\lambda) e^{(\lambda+1)} (u(t-\lambda) - u(\lambda-\Delta))$$

$$y(t) = \int_{-\infty}^{\infty} r e^{\lambda-1} u(-\lambda) e^{(\lambda+1)} u(t-\lambda)$$

$$- \int_{-\infty}^{\infty} r e^{\lambda-1} u(-\lambda) e^{(\lambda+1)} u(\lambda-\Delta)$$

$$= r \int_{-1}^t e^{\lambda-1} e^{\lambda+1} - r \int_{\Delta}^t e^{\lambda-1} e^{\lambda+1} = r \int_{-1}^t e^{2\lambda} - r \int_{\Delta}^t e^{2\lambda}$$

$$= r \left(\frac{1}{2} e^{2\lambda} \right) \Big|_{-1}^t - r \left(\frac{1}{2} e^{2\lambda} \right) \Big|_{\Delta}^t$$

$$= \left(\frac{e^{2t}}{2} - e^{-2} \right) + \left(-e^{2t} - (-e^{2\Delta}) \right) = e^{2\Delta} - e^{2t}$$



$$h[n] = \left(\frac{1}{r}\right)^n u[n]$$

$$g[n] = u[n] - r[n-1] + u[n-4]$$

$$y[n] = \sum_{k=-\infty}^{\infty} (u[k] - r[k-1] + u[k-4])$$

$$\left(\frac{1}{r}\right)^n u[n]$$

$$= \sum_{k=-\infty}^{\infty} \left(\frac{1}{r}\right)^n u[n] u[k] - r \sum_{k=-\infty}^{\infty} \left(\frac{1}{r}\right)^n u[n] u[k-1]$$

$$+ \sum_{k=-\infty}^{\infty} \left(\frac{1}{r}\right)^n u[n] + u[k-4]$$

$$= \sum_{k=0}^n \left(\frac{1}{r}\right)^n u[n] - r \sum_{k=1}^n \left(\frac{1}{r}\right)^n u[n] + \sum_{k=4}^n \left(\frac{1}{r}\right)^n u[n]$$

$$= \left(\frac{\left(\frac{1}{r}\right)^0 - \left(\frac{1}{r}\right)^{n+1}}{1 - \frac{1}{r}} \right) u[n] - r \left(\frac{\left(\frac{1}{r}\right)^0 - \left(\frac{1}{r}\right)^{n+1}}{1 - \frac{1}{r}} \right) u[n]$$

$$+ \left(\frac{\left(\frac{1}{r}\right)^4 - \left(\frac{1}{r}\right)^{n+1}}{1 - \frac{1}{r}} \right) u[n]$$



آذر

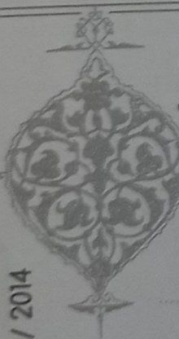
$$= (2(1) - 2(\frac{1}{2})^{n+1})u[n] + (-4(\frac{1}{4}) - 4(-\frac{1}{4})^{n+1})u[n]$$

$$u[n] + (2(\frac{1}{4}) - 2(\frac{1}{2})^{n+1})u[n]$$

$$= (2 - 2(\frac{1}{2})^{n+1})u[n] + (-1 - 4(-\frac{1}{4})^{n+1})u[n]$$

$$+ (\frac{1}{2} - 2(\frac{1}{2})^{n+1})u[n]$$

شهادت آیت ا... دکتر محمد مفتاح (۱۳۵۸ هـ ش) - روز وحدت حوزه و دانشگاه



آذر