SHEET NO (6)

4.1. Find the z-transform of

(a) $x[n] = -a^n u[-n-1]$

(b) $x[n] = a^{-n} u[-n-1]$

4.20. Find the inverse z-transform of

$$X(z) = \frac{z}{z(z-1)(z-2)^2} \qquad |z| > 2$$

4.21. Find the inverse z-transform of

$$X(z) = \frac{2z^3 - 5z^2 + z + 3}{(z-1)(z-2)} \qquad |z| < 1$$

4.32. A causal discrete-time LTI system is described by

$$y[n] - \tfrac{3}{4}y[n-1] + \tfrac{1}{8}y[n-2] = x[n] \qquad (4.88)$$

where $x[n]$ and $y[n]$ are the input and output of the system, respectively.

(a) Determine the system function $H(z)$.

(b) Find the impulse response $h[n]$ of the system.

(c) Find the step response $s[n]$ of the system.