2.

X(k) = u(k)

-2 ≤ k ≤ 8

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| K | u(k) | y(k-1) | y(k-2) | y |
| -2 | 0 |  |  | 0 |
| -1 | 0 | 0 |  | 0 |
| 0 | 1 | 0 | 0 | 1 |
| 1 | 1 | 0.25 | 0 | 1.25 |
| 2 | 1 | 0.3125 | 0.5 | 0.81 |
| 3 | 1 | 0.203 | 0.625 | 0.57 |
| 4 | 1 | 0.144 | 0.6 | 0.73 |
| 5 | 1 | 0.184 | 0.28 | 0.89 |
| 6 | 1 | 0.22 | 0.36 | 0.85 |
| 7 | 1 | 0.21 | 0.44 | 0.769 |
| 8 | 1 | 0.19 | 0.42 | 0.764 |

3.a)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| K | u(k) | u(k-1)/2 | u(k-2)/5 | y(k-1)/4 | -y(k-2)/2 | y |
| -2 | 0 | 0 | 0 | 0 |  | 0 |
| -1 | 0 | 0 | 0 | 0 |  | 0 |
| 0 | 1 | 0 | 0 | 0 |  | 1 |
| 1 | 1 | 0.5 | 0 | 0.25 |  | 1.75 |
| 2 | 1 | 0.5 | 0.2 | 0.43 | -0.5 | 1.63 |
| 3 | 1 | 0.5 | 0.2 | 0.4 | -0.875 | 1.23 |
| 4 | 1 | 0.5 | 0.2 | 0.3 | -0.81 | 1.18 |
| 5 | 1 | 0.5 | 0.2 | 0.29 | -0.61 | 1.38 |
| 6 | 1 | 0.5 | 0.2 | 0.34 | -0.49 | 1.45 |
| 7 | 1 | 0.5 | 0.2 | 0.36 | -0.69 | 1.37 |
| 8 | 1 | 0.5 | 0.2 | 0.34 | -0.72 | 1.31 |

3.b)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| K | 0,2\*u(k) | 0,3\*u(k-1) | 0,3\*u(k-2) | 0,2\*u(k-3) | y |
| -2 | 0 | 0 | 0 | 0 | 0 |
| -1 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0.2 | 0 | 0 | 0 | 0.2 |
| 1 | 0.2 | 0.3 | 0 | 0 | 0.5 |
| 2 | 0.2 | 0.3 | 0.3 | 0 | 0.8 |
| 3 | 0.2 | 0.3 | 0.3 | 0.2 | 1 |
| 4 | 0.2 | 0.3 | 0.3 | 0.2 | 1 |
| 5 | 0.2 | 0.3 | 0.3 | 0.2 | 1 |
| 6 | 0.2 | 0.3 | 0.3 | 0.2 | 1 |
| 7 | 0.2 | 0.3 | 0.3 | 0.2 | 1 |
| 8 | 0.2 | 0.3 | 0.3 | 0.2 | 1 |

4.a)