

following system:

$$y(n) = -0.1y(n-1) + 0.72y(n-2) + 0.7x(n) - 0.252x(n-2)$$

Can the system be causal and stable?

(OR)

b) An IIR digital low pass filter is required to meet the following specifications :

Passband ripple ≤ 0.5 dB; Passband edge : 1.2 kHz;

Stopband attenuation ≥ 40 dB; Stopband edge : 2.0 kHz; Sample rate : 8 kHz

Use bilinear transformation.

24. a) (i) Determine the variance of the roundoff noise at the output of the two cascaded (8)
realizations of the filter $H(z) = H_1(z).H_2(z)$.

$$H_1(z) = \frac{1}{1-\frac{1}{2}z^{-1}} \quad H_2(z) = \frac{1}{1-\frac{1}{4}z^{-1}} \quad \text{Compare them.}$$

(ii) Explain limit cycle oscillations with an example. (6)

(OR)

b) (i) Derive an expression for quantization noise power use suitable assumptions. (8)

(ii) Explain how quantization affects the performance of IIR filters. (6)

25. a) (i) With a block diagram, explain the salient features of DSP architecture. (8)

(ii) Describe how multiplication is done in TMS320C54xx processors. (6)

(OR)

b) (i) Describe the arithmetic instructions available in TMS320C67xx processors with (8)
an example each.

(ii) Compare Von Neumann, Harvard and modified Harvard architectures. (6)
