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A

Total No. of Questions : 9]

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8. Draw the architecture of TMS series of processors. Discuss its main features.

9. Design a digital filter using bilinear transformation for the following analog transfer function :

$$H(s) = \frac{1}{s^2 + \sqrt{2}s + 1}$$

Obtain transfer function $H(s)$ of digital filter assuming 3 db cut off frequency of 150 Hz and sampling frequency of 1.28 kHz.

EC-308 DIGITAL SIGNAL PROCESSING (NEW)



(B.Tech., 6th Semester, 2055)

Time : 3 Hours

Maximum Marks : 60

Note :- Section A is compulsory. Attempt any Four questions from Section B and any Two questions from Section C.

sampling frequency of 1.28 kHz.

Section-A

Marks : 2 Each

1. (a) List applications of Digital Signal Processing.
(b) What are the features of TMS series of processor?
(c) What is the importance of ROC?
(d) Define z-transform.
(e) What is the relationship between z-transform and Laplace transform?

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- (f) Differentiate between FIR and IIR filters.
- (g) List name of structure for FIR system.
- (h) What are the advantages of Digital filter over analog filter?
- (i) Find the z-transform of $\delta(n) = 1$ at $t=0$.
- (j) What are various methods of finding inverse z-transform?

Section-B Marks : 5 Each

2. Solve the following second order difference equation :

$$2x(n-2) - 3x(n-1) + x(n) = 3^{n-2} \quad n > 0.$$

3. Find inverse z-transform of

$$X(z) = \frac{5}{1-z^{-1}} - \frac{7}{1-\frac{8}{5}z^{-1}}$$

If:

- (a) $ROC = |z| > 1$
- (b) $|z| < 3/5$
- (c) $ROC = 3/5 < |z| < 1$.

- 4. State 3 properties of z-transform and give examples.
- 5. State 3-properties of Fourier Transform and give examples.
- 6. What is decimation in frequency for computing DFT? What are advantages of Radix 2FFT.

Section-C Marks : 10 Each

7. Fig. 1 shows direct-II form of realisation of IIR filter:

- (a) Find Transform functions $H(z)$ of filter.
- (b) Find corresponding difference equation
- (c) Realize filter using cascade form using first order module?
- (d) Find impulse response function for filter.

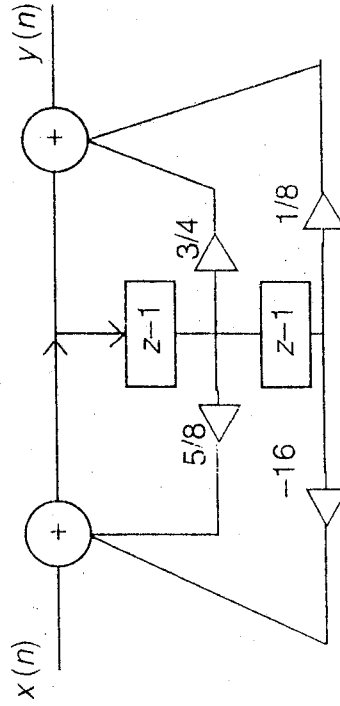


Fig. 1