

**M.Tech. 1st Semester (ECE) (CBCS Scheme)**  
**Examination, December-2019**  
**ADVANCED DIGITAL SIGNAL PROCESSING**  
**Paper-MTECE21C4**

*Time allowed : 3 hours]*

*[Maximum marks : 100*

*Note : Attempt five question in all selecting one question from each sections. Question No. 1 is compulsory. All question carry equal marks.*

1. (a) Explain the inverse fourier transform.  
(b) Discuss briefly the Fast fourier Transform.  
(c) Quantisation affects in analog to digital conversion of signal.  
(d) Discuss parallel realization technique. 5×4

**Section-A**

2. (a) Classify discrete linear systems ? Elaborate its various properties ? 10  
(b) What are the basic elements of Digital Signal Processing (DSP) system ? List the advantages of digital signal processing over analog signal processing. 10

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3. Explain the process of reconstruction of the continuous-time signals from Discrete-time sequences. 20

**Section-B**

4. (a) Discuss the various properties of Discrete Fourier Transform (DFT) in detail. 10  
(b) What is the need of FFT algorithm? State its computational requirements. 10
5. (a) Define the properties of the region of convergence and of the Z transform. 10  
(b) Determine the z-transform of the signal. 10

$$x(n) = \left(\frac{1}{2}\right)^n u(n)$$

**Section-C**

6. (a) Design a IIR filters by Bilinear Transformation Method. 10  
(b) Differentiate between FIR and IIR filters. 10
7. (b) Obtain a cascade realization of the system characterized by the transform function :

$$H(Z) = \frac{2(Z+2)}{Z(Z-0.1)(Z+0.5)(Z+0.4)} \quad 10$$

- (b) Explain any two structures each for realizing FIR 10

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**Section-D**

8. (a) What is finite word length effect in Digital filters? 10  
(b) Discuss the direct form of cascaded realization of (IIR) filter. 10
9. (a) Explain finite word length effect in Digital filters. 10  
(b) Discuss the different design techniques of digital filters. 10

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