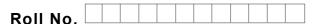


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B.Tech.(Electronics & Electrical) (2011 Onwards) B.Tech. (Electrical & Electronics) (2013 Batch) (Sem.-6) DIGITAL SIGNAL PROCESSING Subject Code : BTEEE-601 Paper ID : [A2321]

Time: 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

- 1. Write briefly :
 - a) Discuss the various elementary discrete time signal.
 - b) Write down the advantages of FFT over DFT.
 - c) Discuss the importance of ROC in Z transform.
 - d) What do you mean by pass band ripple? Explain.
 - e) Compare the different windows used for FIR filter design.
 - f) List the advantages and disadvantages of FIR filters.
 - g) Explain the basic elements of a DSP system.
 - h) List the advantages of DSP processors.
 - i) What do you mean by convolution? Explain.
 - j) Briefly discuss the effect of quantization of filter coefficients.



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SECTION-B

- 2. Discuss the advantages, disadvantages and applications of digital signal processing in detail.
- 3. Find the inverse Z-transform of X (z) = $\frac{z}{(z-0.75)(z-0.5)^2}$.
- 4. Discuss in detail the use of DFT in linear filtering.
- 5. Describe the lattice structure of FIR and IIR filters. Also give a comparison between them.
- 6. By citing an example explain impulse invariance methodology used for the design of digital IIR filters.

SECTION-C

7. Compute the 16-point DFT of the sequence

$$x(n) = \begin{cases} n+2, & 0 \le n \le 7\\ n+4, & 8 \le n \le 15\\ 0, & \text{otherwise} \end{cases}$$

using the radix-2 decimation in frequency FFT algorithm.

8. Determine the cascade and parallel realizations for the systems described by the system function

$$H(z) = \frac{10 (1 - 0.5 z^{-1}) \left(1 - \frac{2}{3} z^{-1}\right) (1 + 2z^{-1})}{\left(1 - \frac{3}{4} z^{-1}\right) \left(1 - \frac{1}{8} z^{-1}\right) \left[1 - \left(\frac{1}{2} + j \frac{1}{2}\right) z^{-1}\right] \left[1 - \left(\frac{1}{2} - j \frac{1}{2}\right) z^{-1}\right]}$$

9. Discuss the architecture of TMS series of DSP processor in detail.