

Roll No.

3219

**B. Tech. 5th Semester (ECE)
Examination – February, 2022**

DIGITAL SIGNAL PROCESSING

Paper : PCC-ECE-307-G

Time : Three Hours]

[Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. 1 is *compulsory*. Students have to attempt one question from each Section.

1. (a) What are Discrete-Time signals ?
- (b) Write a note on inverse Z-transforms.
- (c) What is circular convolution ? Explain with example.
- (d) Differentiate ideal & practical filters.
- (e) Write two applications of digital signal processing.
- (f) What are digital filter banks ? 2.5 × 8

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SECTION - A

2. What is sampling theorem ? Write down three steps of sampling. How signals are reconstructed ? 15
3. (a) What is ROC in Z-transform ? 7.5
(b) Write down various properties of Z-transform for causal signals. 7.5

SECTION - B

4. (a) What is the need of Frequency Domain analysis of signals ? 7.5
(b) Write down the concept of Discrete Fourier Transform (DFT) and its properties. 7.5
5. (a) What is convolution ? 7.5
(b) Explain Parsevals Identity. 7.5

SECTION - C

6. (a) Compare IIR & FIR filters. 7.5
(b) What are various steps involved in design of digital filters ? 7.5
7. Write a note on :
(a) Design of IIR filters using Butterworth. 7.5
(b) Digital frequency transformation. 7.5

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SECTION - D

8. (a) Draw block diagrams for FIR & IIR systems & explain them. 7.5
(b) What is parametric & non-parametric spectral estimation ? 7.5
9. Write about :
(a) Multirate digital signal processing. 7.5
(b) Polyphase decomposition. 7.5

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