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 × 6

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

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