

M.Sc. F.Y. (Electronics) CBCS Pattern Semester-III
PSELT303.1 - (DSE-I) Paper-III : Digital Signal Processing

P. Pages : 1

Time : Three Hours



GUG/W/23/11255

Max. Marks : 80

- Notes :
1. All questions are compulsory and carry equal marks.
 2. Draw well labeled diagrams wherever necessary.
 3. Use of log table / calculator is allowed.

Either:

1. a) Explain Linear Time Invariant Systems in details. **8**
b) Define a rectangular window and derive the frequency response of the rectangular window. **8**

OR

- c) Consider the LTI system: $y(n) = x(n) + x(n-1) - 2x(n-2) - 4x(n-4)$
Determine direct form-II realization for the given system. **8**
d) Explain any four properties of Discrete Fourier Transform (DFT). **8**

Either:

2. a) Write a short note on chirp Z transform algorithm and its advantages. **8**
b) Explain any four properties of Fourier transform. **8**

OR

- c) Explain pole zero plot. **8**
d) Explain the inverse z-transform and its methods. **8**

Either:

3. a) Give advantages and disadvantages of FIR filters. **8**
State and explain at least three characteristics of FIR filters.
b) Explain Kaiser window filter design method. **8**

OR

- c) Explain Cascade form realization of FIR Filters. **8**
d) Explain Fourier series method of FIR filter design. **8**

Either:

4. a) What are the applications of DSP? How does a DSP chip work? **8**
b) What is the use of DSP processors in real world applications? **8**

OR

- c) Explain architecture of DSP processors. **8**
d) Explain implementation of noise removal techniques in DSP processors. **8**

5. Attempt the following.

- a) State the difference between DFT and DTFT. **4**
- b) What is Fourier series method? **4**
- c) Explain echo and chorus effects introduced in music. **4**
- d) Explain frequency sampling method in FIR filter design. **4**
