Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 08

M.Tech. (ECE) (Sem–2)

ADVANCED DIGITAL SIGNAL PROCESSING

Subject Code : MTEC-104-18

M.Code : 76260

Date of Examination : 07-06-2023

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT questions.**
2. **Each question carries TWELVE marks.**

1. Obtain the coefficients of an FIR low-pass filter to meet the specifications given below using the window method.

   Passband edge frequency = 1.5 *kHz*

   Transition width = 0.5 *kHz*

   Stopband attenuation > 50 *dB*

   Sampling frequency = 8 *kHz*.

2. Discuss the concept of decimation and interpolation with suitable examples. Also, discuss poly-phase filters, in detail.

3. a) What is linear prediction? Explain in detail optimum linear filters.

   b) Discuss wiener filters for filtering and prediction.

4. What is meant by adaptive filters? Explain the LMS algorithm in detail.

5. a) Compare Parametric and Non-Parametric methods of spectral estimation in detail.

   b) Explain the eigen analysis algorithms for spectral estimation.

6. a) Explain AR and ARMA Ladder-Lattice Filters in detail.

   b) Discuss the application of multi-rate digital signal processing in sub-band coding.

7. a) Write a note on performance analysis of estimators.

   b) Discuss the decimation-in-time and decimation-in-frequency FFT algorithms.

8. Discuss the applications of digital signal processing for the design of phase shifters.

NOTE : Disclosure of identity by writing mobile number or making passing request on any page of Answer sheet will lead to UMC case against the Student.