

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 : 11-05-2024

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. a) Write a short note on design of IIR filter by the Bilinear Transformation Method.
b) Convert the analog filter with system function

$$H(s) = \frac{s + 0.1}{(s + 0.1)^2 + 9}$$

into a digital IIR filter by means of the impulse invariance technique.

2. Discuss the concept of decimation and interpolation with suitable example. Also, discuss QMF filters in detail.
3. a) What is Linear prediction? Explain in detail forward-backward linear prediction filters.
b) How FIR wiener filter can be used as noise cancellation?
4. a) Discuss in detail about adaptive filter applications.
b) Describe LMS adaptive algorithm with a neat diagram.
5. a) Explain the estimation of spectra from finite-duration observations of signals.
b) Compare Parametric and Non-Parametric methods of spectral estimation in detail.

6. a) Differentiate between FIR and IIR filters. Also, discuss the difference in their structures.
b) Discuss the application of multi-rate signal processing to sub-band coding.
7. a) Discuss Wiener filters for filtering and prediction.
b) Explain minimum mean square criterion for adaptive filters.
8. Discuss the applications of digital signal processing in radar and image processing.

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.