

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION
FOURTH SEMESTER B.TECH. (E&C)
IA - 3 (Take home assignment)**

DIGITAL SIGNAL PROCESSING (ECE 2222)
Submission Date: On or before April 1, 2025

- 1) Describe Welch method of PSD estimation. Highlight the computation requirement of this method. List the AR model estimation methods.
- 2) Describe Bartlett method of Power spectrum estimation. Highlight the computation requirement of this method. List the advantages of Nonparametric methods.
- 3) Describe with mathematical expressions the Blackman-Tukey method of power spectrum estimation. Describe the spectral leakage and spectral resolution problems occurring in estimation of spectra from finite duration observation of signals.
- 4) Explain the periodogram method of power spectrum estimation. Highlight the limitations of this method. Discuss how other non-parametric power spectrum estimation techniques address these limitations.
- 5) Explain the estimation of power spectrum using autocorrelation function. Briefly explain one such method of power spectrum estimation. Mention the important system models and corresponding system function used for parametric power spectrum estimation.
