APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST SEMESTER M. TECH DEGREE EXAMINATION

Electronics & Communication Engineering

(Telecommunication Engineering)

04 EC6807- Advanced Digital Signal Processing

Max. Marks : 60 Duration: 3 Hours

PART A

Answer All Questions

Each question carries 3 marks

1. Illustrate the process of decimation with the help of an example?
2. Discuss the two conventional methods used to achieve multirate sampling?
3. What is the mother wavelet concept?
4. Describe time -frequency analysis of signals?
5. Which are the two distinct methods for computing energy density spectrum of a signal from its samples?
6. Write a note on the AR processes for power spectrum estimation.
7. Describe WSS process and explain its properties?
8. What are the properties of linear prediction-error filters?

PART B

Each question carries 6 marks

9. Discuss the design of phase shifters as application of multirate signal processing.

OR

10. Illustrate the aliasing effect in frequency domain caused by downsampling with help of diagrams.

11. Derive the polyphase structure for fractional sampling rate converter.

OR

12. Find the 2 band Polyphase decomposition of filter with transfer function $H(z) = \frac{1-2Z^{-1}}{1+3Z^{-1}}$
13. Explain time frequency tiling in case of continuous wavelet transform.

OR

14. Explain various transforms used for time frequency analysis with the help of suitable diagrams and necessary equations?
15. Discuss the procedure for employing haar wavelet in image compression.

OR

16. Explain how multiresolution analysis is achieved using wavelet transform.
17. Discuss the averaging periodograms method in detail.

OR

18. Explain ARMA parametric method for power spectrum estimation of signals.
19. Compare forward and backward linear prediction.

OR

20. Describe LMS algorithm used for adaptive filtering techniques.