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. Define the process of interpolation? Give one example?
2. Discuss desirable characteristics of filter banks?
3. List out various transforms used for time frequency analysis?
4. Describe Heisenberg uncertainty principle with respect to wavelets?
5. Illustrate the periodogram averaging.
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 time domain characterization of sampling rate alteration devices.

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. a)Find the 2 band Polyphase decomposition of filter with transfer function $H(z) = \frac{1-2Z^{-1}}{1+3Z^{-1}}$

    b)Realize a decimator with factor of 3(M=3) using a length-12 type-1 linear-phase FIR low pass filter

13. Explain time frequency tiling in case of continuous wavelet transform.

OR

14. Compare haar and daubechies wavelets.
15. Discuss the procedures involved in image compression technique.

OR

16. Explain how multiresolution analysis is achieved using wavelet transform.
17. Discuss the periodogram procedure 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.