Register No.: …… Name: ……..

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FIRST SEMESTER M.TECH DEGREE EXAMINATION (Regular), FEBRUARY 2022

TELECOMMUNICATION

(2021 Scheme)

Course Code : 21TE105-A

Course Name: ADVANCED DIGITAL SIGNAL PROCESSING

Max. Marks : 60 **Duration: 3 Hours**

PART A

(Answer all questions. Each question carries 3 marks)

1. Compare and contrast DFT and FFT
2. Describe fractional sampling rate conversion.
3. Implement uniform filter bank using polyphase decomposition.
4. Explain the orthogonality of Haar scaling function and Haar wavelet function.
5. Express augmented Wiener-Hopf equations for linear prediction filters?
6. Explain the orthogonality in FIR Wiener filter
7. Describe Yule-Walker equations.
8. Explain periodogram averaging

PART B

(Answer one full question from each module, each question carries 6 marks)

MODULE I

9. Compare and contrast linear and circular convolution using following sequences X(n)={2,3,1,2} and h(n)= {2,1,1,2} (6)

OR

10. Illustrate various classes of filters used in digital signal processing. (6)

MODULE II

11. Describe basic multirate operations in digital domain with suitable demonstration in time domain. (6)

OR

12. Explain aliasing effect in frequency domain caused by down sampling with example. (6)

MODULE III

13. Illustrate the polyphase structure for fractional sampling rate converter. (6)

OR

14. Illustrate two channel quadrature mirror filter banks using polyphase representation. (6)

MODULE IV

15. Discuss discrete wavelet transform and it's applications in detail. (6)

OR

16. Explain the application of wavelet transform for data compression in speech processing. (6)

MODULE V

17. Explain parametric methods for power spectrum estimation. (6)

OR

18. Describe the Bartlett's method for power spectrum estimation. (6)

MODULE VI

19. Explain forward linear prediction filter in detail. (6)

OR

20. Explain the steepest – descent algorithm and its application to Wiener filter (6)

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