

B.Tech IV Year II Semester (R15) Advanced Supplementary Examinations July 2019

ADVANCED DIGITAL SIGNAL PROCESSING – MULTIRATE & WAVELET

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

1 Answer the following: (10 X 02 = 20 Marks)

- (a) Define uncertainty principle with an expression.
- (b) Give the relation between dyadic MRA to filter banks.
- (c) Mention the applications of wavelets in Geophysical signal analysis.
- (d) Write the effect of cascading a $(1 - z^{-1})$ term in the high pass analysis filter.
- (e) Write relation to the ideas of fractals and fractal phenomena.
- (f) Write expression for Gaussian function and state its realizability.
- (g) State the theorem of MRA with an Expression.
- (h) Write any two applications of CWT in wideband signal processing.
- (i) Mention the data compression standards in signal processing.
- (j) Write the expression for the output of M-channel filter bank.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 With the help of an example, discuss the magnetic resonance imaging.

OR

3 Write the different types of wavelets and compare them.

UNIT – II

4 Explain the Conjugate Quadrature filter bank design with an example.

OR

5 Design JPEG 2000 5/3 filter bank and write its advantages.

UNIT – III

6 Explain the importance of Gaussian function with necessary expressions.

OR

7 Explain filter bank interpretation of CWT with an example.

UNIT – IV

8 Derive the condition for Orthogonal MRA with Splines.

OR

9 With help of an example, discuss the computational efficiency in realizing filter banks.

UNIT – V

10 Discuss the applications of wavelets related to bio-medical signal processing.

OR

11 Describe the efficient signal design and approximations with an example.
