

B.Tech IV Year II Semester (R13) Advanced Supplementary Examinations July 2017  
**ADVANCED DIGITAL SIGNAL PROCESSING MULTIRATE & WAVELET**  
 (Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70

**PART – A**  
 (Compulsory Question)

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- 1 Answer the following: (10 X 02 = 20 Marks)
- What do you mean by time frequency analysis?
  - Specify the speciality of Haar wavelet functions.
  - Compare orthogonal wavelets with bi-orthogonal wavelets.
  - Draw the block diagram of a two channel analysis and synthesis filter banks.
  - State Heisenberg's uncertainty principle.
  - What is the relationship between scale and frequency?
  - What is the advantage of discrete wavelet over continuous wavelet?
  - How wavelet packet transform is variant of wavelet transform?
  - What is the use of wavelets in geophysical signal analysis?
  - What are all the applications of fractals in imaging & signal processing?

**PART – B**  
 (Answer all five units, 5 X 10 = 50 Marks)

**UNIT – I**

- 2 Discuss in detail about the formation of dyadic multi-resolution analysis in wavelets.

OR

- 3 Mention the practical situation which demands the need for time-frequency analysis and wavelets. Also Discuss about beginning of wavelet for image processing.

**UNIT – II**

- 4 Explain in detail about various signal processing related elements of multi-rate systems.

OR

- 5 Construct the block diagram of JPEG 2000 image compression standard and explain each individual blocks in detail.

**UNIT – III**

- 6 Explain in detail about the application of the continuous wavelet transform in wideband correlation processing.

OR

- 7 Explain in detail about continuous wavelet transform and its admissibility condition.

**UNIT – IV**

- 8 Derive and explain the relationship between wavelets and filter banks.

OR

- 9 Explain with neat block diagram the analysis and synthesis sections of a filter bank structure.

**UNIT – V**

- 10 Explain how wavelet and multi-rate systems are effective in biomedical signal processing applications.

OR

- 11 Explain how wavelets are helping in computer graphics and computer vision based applications

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