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**Presidency University**

**Bengaluru**

 **Ph.D. Course Work End Term Examinations – JAN-FEB 2025**

**Date**: 31-01-2025

**Time**: 9.30 AM TO 12.30 PM

**Max Marks**: 100

**Weightage**: 50%

**Semester**:

**Course Code**: MAT842

**Course Name**: Transform Techniques for Signal Analysis

**School:** SOE

 **Instructions:**

1. *Read the all questions carefully and answer accordingly.*
2. *Do not write any matter on the question paper other than roll number.*

**PART A**

 **Answer all the Questions. Each question carries 10 marks. (6Qx 10M= 60M)**

1. a. Define Fourier transform, and list the applications of Fourier Transform

b. Find the Fourier Transform of $\left(x\right)=\left\{\begin{array}{c}2-x \left|x\right|\leq 1\\0 \left|x\right|>1\end{array}\right.$ . (C.O.NO. 1) [Comprehension])

1. Define discrete wavelet transforms. Also explain how it is used in image processing. (C.O.NO. 3) [Comprehension])
2. Explain Non-separable multidimensional wavelets. (C.O.NO. 3) [Comprehension])
3. What are the advantages and applications on Haar wavelets (C.O.NO. 2) [Comprehension])
4. Explain audio masking and Wavelet packets. (C.O.NO. 4) [Comprehension])
5. How do wavelets handle discontinuities in a signal? (C.O.NO. 4) [Comprehension])

**PART B**

 **Answer all the Questions. Each question carries 20 marks. 2Qx 20M= 40M)**

1. Explain the workflow for detection of arrhythmia or arrhythmia free signal from a

 given ECG dataset using Discrete Wavelet Transforms.

 (C.O.NO. 3) [Application])

 8. Explain the procedure in detail, the application of Wavelet transforms for

 Image compression. (C.O.NO. 4) [Application])