Roll No. .....

Y – 3182

M.A/M.Sc. (Mathematics) Fourth Semester EXAMINATION,

May/June-2021

Paper – 403

WAVELETS

Time : Three Hours

Maximum Marks : 85 *Minimum Pass Marks : 29*

Note—Attempt *all* questions.

Unit-I

1. Explain the In-place Fast Haar wavelet transform and write the algorithm to obtain it. Find the In-place Haar wavelet transfer of the sample 17
$\overline{S} = (8, 6, 7, 3, 1, 1, 2, 4)$

Unit-II

2. Compress the signal given by the In-place Haar wavelet transform $\overline{S}^{(0)} = (4, -1, -1, 2, 0, 1, -2, -2)$. Also identity the location and magnitude of the edges in the initial sample. 17

Unit-III

3. If W is the subspace of the inner product space V and $\overline{w}$ is the member of W closest to $\overline{v}$ for some $\overline{v} \in V$ then prove that— 17

$$\overline{v} = \overline{w} \perp W$$

Unit-IV

4. Prove that for every $f \in C^{1}_{1,2T}{}^{(R,C),}$ the partial sums $S_N(f)$ converge uniformly to f and

17

$$\sum_{k \varepsilon Z} |C_{f,k}| < \infty$$

Unit-V

5. Define the convolution of two integrable function and prove that convolution is commutative. 17