EBU6018 Advanced Transform Methods revision questions.

1. List the various forms of the Fourier Transform.
2. What is the Fourier Transform used for?
3. What is the principal limitation of the Fourier Transform?
4. What are the basis functions of the Fourier transform?
5. What is meant by the term “Windowed Transform”?
6. What advantage is gained by using a windowed transform?
7. What is the implication of the Uncertainty Principle

   a) in general, and

   b) specifically related to windowed transforms?
8. Compare the mathematical expressions for the Fourier Transform and the Short Time Fourier Transform.
9. What is a Wavelet?
10. What advantage does a wavelet transform have over a short time Fourier Transform?
11. What is a Spectrogram?
12. What is a Scalogram?
13. How can a wavelet transform be used for “feature extraction”?
14. How can a wavelet transform be used for “trend analysis”?
15. Refer to a Haar Matrix to explain the answers to Q13 and Q14
16. Does the Uncertainty Principle hold for the Wigner-Ville Distribution?
17. What is the main advantage of the Wigner-Ville distribution?
18. What is the main disadvantage of the Wigner-Ville Distribution?
19. Compare the DCT and the KLT.