Total No. of Questions :8]

SEAT No. :

P3527

[Total No. of Pages :2

[4959]-1088
B.E. (E & TC)
Multirate & Adaptive Signal Processing
(2012 Pattern) (Elective - II) (Semester - I)

Time : 2½ Hours *[Max. Marks :70]*

Instructions to candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.***
3) ***Assume suitable data, if necessary.***

Q1) a) Explain Time Bandwidth product with suitable example. **[5]**

b) Explain the difference between Fourier basis & Harr basis. **[5]**

c) Explain filing diagram of STFT. **[5]**

d) Explain Wigner Ville distribution. **[5]**

OR

Q2) a) Explain in detail methods adopted for interfacing digital systems with different sampling rates. Where do you need it? Explain the concept of up sampling and down sampling with the help of block diagram and waveforms. **[10]**

b) Give the limitations of Fourier transform. **[5]**

c) Explain with equation continuous wavelet transform. **[5]**

Q3) Decompose $x(n) = \{1,6,3,8,2,4,6,2\}$ using Harr wavelet packets till V_0. Assume $x(n) \in V_3$. Reconstruct the decomposed sequence using proper basic. **[18]**

OR

P.T.O.

Q4) a) Derive perfect reconstruction conditions for Harr two band filter bank structure. **[10]**

b) Define MRA and explain the various axioms associate with it. **[8]**

Q5) a) Explain Noise cancellation using adaptive filters. **[8]**

b) Explain various components of adaptive filters. **[8]**

OR

Q6) a) Explain RLS algorithm in detail. **[8]**

b) Explain the basics of Wiener filters. **[8]**

Q7) a) Explain efficient D/A conversion in Hifi systems. **[8]**

b) Explain with block diagram adaptive telephone echo cancellation. **[8]**

OR

Q8) a) Explain use of wavelets in compression. **[8]**

b) Using Harr Lifting scheme decompose $x(n) = \{9,2,3,4\}$ till V_0. Assume $x(n) \in V_2$. **[8]**