B.Tech. SEM -VII Electrical 2014 Course (CBCS) : WINTER - 2018

SUBJECT-ELECTIVE-III DIGITAL SIGNAL PROCESSING

Day: Wednesday
Date: 28/11/2018

W-2018-2548

Time: 02.30 PM TO 05.30 PM
Max. Marks: 60

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Assume suitable data if necessary.

Q.1 Explain following properties of D-T-LIT system with suitable example. **(10)**

i) Time invariance
ii) Stability
iii) Linearity
iv) Casualty
v) Cascade connection

OR

Q.1 Prove that DT-LIT system is casual if h(n) = 0 for n < 0 **(10)**

Q.2 State any explain windowing (modulation) theorem. And hence comment on what are sufficient conditions for existence of Fourier transform. **(10)**

OR

Q.2 Write any 5 properties of Z-transform and what is significance of ROC. **(10)**

Q.3 Write short note on ideal frequency selective filter. What is group delay and phase distortion **(10)**

OR

Q.3 Explain ideal low pass and high pass frequency filter. **(10)**

Q.4 **a)** Sate & explain following properties of DFT **(05)**
i) Periodicity **ii)** Linearity

b) Explain Radix-2 DIT-FFT algorithm for N=8 **(05)**

OR

Q.4 **a)** Compare DFT with DTFT **(05)**

b) Compare the IDFT of x(k)={3, 1, j, 0, 1-j, 2} **(05)**

Q.5 **a)** Differentiate between bilinear transformation method & impulse variance method. **(05)**

b) State & define various kinds of window functions used for FIR filter design. **(05)**

OR

Q.5 **a)** Compare FIR &IIR filters. **(05)**

b) Determine H(z) for the analog transfer function $H(s)=\frac{s+3.524}{S^2+0.587s+0.309}$ **(05)**
using bilinear transformation .assume T= 0.1 Sec

Q.6 **a)** Explain basic structure of FIR filters **(05)**

b) The difference equation is given by **(05)**
$y(n)-\frac{1}{3}\,y(n-1)=x(n)+4\,x(n-1)-2x(n-2)$ realize it using direct form –I structure.

Q.6 **a)** Realize the system with difference equation **(05)**
$y(n)=\frac{1}{4}\,y(n-1)+\frac{1}{5}\,y(n-2)+x(n)-\frac{2}{3}\,x(n-1)$ in cascade from

b) Write a short note on finite register length effect **(05)**

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