

R07

Code: R7311902

III B. Tech I Semester (R07) Supplementary Examinations, May 2012

DIGITAL SIGNAL PROCESSING
(Electronics & Computer Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE questions
All questions carry equal marks

- 1 State and prove following properties DTFT:
(i) Periodicity.
(ii) Time – shifting.
(iii) Multiplication by 'n' in time domain.
- 2 (a) Show that DFS of periodic sequence $x_p(n)$ is periodic with same period.
(b) State and prove duality property of DFS.
- 3 Explain radix 2 DIF-FFT algorithm in detail. Explain how calculations are reduced.
- 4 State and prove following properties of z-transform:
(i) Time reversal.
(ii) Time convolution.
(iii) Differentiation in z-domain.
- 5 Discuss the approximation of IIR filter design using derivatives.
- 6 Give the expression for Bartlett window function. Find its frequency response and also sketch its spectrum. Also discuss its features.
- 7 Implement a two stage decimator for the following specifications. Sampling rate of the input signal = 10,000 Hz:
M=50.
Pass band = 0 to 40 Hz.
Transition band = 40 to 50 Hz.
Pass band ripple = 0.01.
Stop band ripple = 0.002.
- 8 Explain what is meant by instruction pipelining. Explain with the example, how pipe lining increases the throughput efficiency.
