

BE - SEMESTER-VIII • EXAMINATION – SUMMER 2014

Date: 31-05-2014

Total Marks: 70

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1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

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|------------|-----|---|------------------------|
| Q.1 | (a) | Define 1) Signal 2) System 3) Sampling | 04 |
| | (b) | Find the fundamental period of 1) $x(t) = 2\cos(10t+1) - \sin(4t-1)$
2) $x(n) = 1 + e^{j4\pi n/7} - e^{j2\pi n/7}$ | 04 |
| | (c) | Sketch the following signals/sequence: 1) $u(n+2) u(-n+3)$
2) $x(n) = u(n+4) - u(n-2)$ 3) $x(n) = \{3, 7, 2, 0, 2, 5, 8\}$ | 06 |
| Q.2 | (a) | Find the convolution of $x(n) = (1/2)^n u(n)$ and $h(n) = u(n) - u(n-10)$ | 07 |
| | (b) | State only, the properties of z transform and ROC. Also explain the importance of ROC in z transform. | 07 |
| | | OR | |
| | (b) | State and prove Final Value theorem for Z-transform. | 07 |
| Q.3 | (a) | Find the correlation of sequence $x(n) = \{-1, 2, 1\}$ and $y(n) = \{5, 1, 1\}$ | 07 |
| | (b) | Derive the relationship between Z-transform and Discrete Time Fourier Transform (DTFT). | 07 |
| | | OR | |
| Q.3 | (a) | State and prove Parseval's relation for DTFT. | 07 |
| | (b) | Explain the interconnection of LTI systems. | 07 |
| Q.4 | (a) | Explain the architecture of general purpose DSP processors. | 08 |
| | (b) | Find the Z-transform of $x(n) = (1/2)^n u(n) * (1/4)^n u(n)$ using convolution property of Z-transforms. | 06 |
| | | OR | |
| Q.4 | (a) | Find the inverse Z-transform of $x(z) = \frac{z^{-1}}{3 - 4z^{-1} + z^{-2}}$; ROC: $ z > 1$ by partial fraction expansion method. | 06 |
| Q.4 | (b) | Explain the following terms with respect to Digital Signal Processor:
1) Pipelining
2) MAC | 05
03 |
| Q.5 | (a) | State the properties of Discrete Fourier Transform (DFT) and prove the Time Reversal property of DFT. | 07 |
| | (b) | Explain the structures for realization of IIR systems. | 07 |
| | | OR | |
| Q.5 | (a) | Explain the structures for realization of FIR systems. | 07 |
| | (b) | Explain Radix-2 FFT and DIT algorithm. | 07 |
