

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V • EXAMINATION – SUMMER 2013****Subject Code: 150303****Date: 21-05-2013****Subject Name: Signals and Systems****Time: 10.30 am - 01.00 pm****Total Marks: 70****Instructions:**

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

- Q.1** (a) Give classification of signals with example. **07**
 (b) What is signal energy and signal power? Explain. **07**

- Q.2** (a) With example discuss time scaling and time reversal. **07**
 (b) Write short note on (a) Unit Impulse Function $\delta(t)$, and (b) Exponential Function e^{st} . **07**

OR

- (b) Distinguish between (a) Instantaneous and dynamic systems, and (b) causal and noncausal systems. **07**

- Q.3** (a) **07**
 (b) With example explain signal shifting and time reversal. **07**

OR

- Q.3** (a) Explain the advantages of digital signal processing. **07**
 (b) Determine $c[n] = x[n] * g[n]$ for $x[n] = (0.8)^n u[n]$ and $g[n] = (0.3)^n u[n]$ **07**

- Q.4** (a) Explain the properties of bilateral z-transform. **07**
 (b) For the system specified by the equation $y[n+1] - 0.8y[n] = x[n+1]$ find the system response to the input (a) $1^n = 1$, (b) $\cos[\frac{\pi}{6}n - 0.2]$, (c) a sampled sinusoid $\cos 1500t$ with sampling interval $T = 0.001$. **07**

OR

- Q.4** (a) Explain frequency-division multiplexing. **07**
Q.4 (b) Find the inverse z-transform of $X(z) = \frac{-z(z+0.4)}{(z-0.8)(z-2)}$ **07**

- Q.5** (a) Enlist the properties of DFT with explanation. **07**
 (b) Find the zero-state response of a stable LTIC system with frequency response $H(s) = \frac{1}{s+2}$ and the input is $x(t) = e^{-t}u(t)$ **07**

OR

- Q.5** (a) Explain Nyquist sampling theorem. **07**
 (b) Find Fourier transform of $e^{-2t}u(t)$ using DFT. Plot the results. **07**

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