GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-V • EXAMINATION – WINTER 2013

Subject Code: 150303 Date: 04-12-2 Subject Name: Signals and Systems		Code: 150303Date: 04-12-2013Name: Signals and Systems	013	
Ti1 Inst	ne: 1 tructio 1. 2.	0.30 am - 01.00 pm Total Marks: 70 ms: Attempt all questions. Make suitable assumptions wherever necessary.		
	3.	Figures to the right indicate full marks.		
Q.1	(a) (b)	Define system and give its classification. Explain signal energy and signal power with diagram.	07 07	
Q.2	(a) (b)	Discuss the advantages of Digital signal processing. Write the statement of sampling theorem. And explain the effect of Nyquist criteria on power spectrum.	07 07	
	(b)	Short note on : PCM	07	
Q.3	(a) (b)	Explain time advance, time delay and time reversal with appropriate diagrams. Find $y_0(t)$, the zero-input component of the response for an LTIC system described by the following differential equation: $(D^2+6D+9) y(t) = (3D+5) x(t)$ When initial conditions are $y_0(0) = 3$ and $\mathring{y}_0(0) = -7$.	07 07	
Q.3	(a)	Explain time compression, time expansion and time reversal with appropriate	07	
	(b)	diagrams. Determine the unit impulse response of LTIC system described by the following equation, (D+2) y(t)=(3D+5) x(t)	07	
Q.4	(a) (b)	Describe the properties of Z-transform. For an LTID system described by the following equation, y[n+2]-0.6y[n+1]-0.16y[n]=5 x[n+2] Find the total response it the initial conditions are $y[-1]=0$ and $y[-2]=25/4$, and if the input $x[n]=4^{-n}u[n]$.	07 07	
• •		OR	•	
Q.4	(a) (b)	Find the z-transform of $cos\beta nu(n)$. Find the unit impulse response h[n] of system specified by the equation, y[n]-0.6y[n-1]-0.16y[n-2]=5 x[n]	07 07	
Q.5	(a) (b)	Explain Decimation in Time FFT algorithm. Find the inverse z-transform of, $\frac{1}{(z-1)(z+0.5)}$	07 07	
~ -		OR	~-	
Q.5	(a) (b)	Explain the properties of DFT in detail. Find the inverse z-transform of, $\frac{8z - 19}{(z - 2)(z - 3)}$	07 07	
