P. Pages : 2 Time : Three Hours Notes : 1. Al 2. III 3. At		2 ree Hours $* 3 1 0 7 *$	GUG/W/18/1098 Max. Marks :	GUG/W/18/10980 Max. Marks : 70	
		 es: 1. All questions carry equal marks. 2. Illustrate your answers wherever necessary with the help of 3. Attempt any five questions. 	Il questions carry equal marks. lustrate your answers wherever necessary with the help of neat sketches. attempt any five questions.		
1.	a)	Find Inverse z-trans form using Cauchy's Residue theorem. $x(z) = \frac{z}{(z-1)^2} z > 1$		7	
	b)	Given $x(n) = \{1, 2, 3, 4, 4, 3, 2, 1\}$ find $X(k)$ using DIT FFT algorithm.		7	
2.	a)	Convert the analog filter into a digital Filter whose system function is $H(s) = \frac{s+0.2}{(s+0.2)^2+9}$ Use the impulse invariant technique. Assume T = 1 sec.	S	7	
	b)	Convert the analog filter with system function. $H(s) = \frac{S+0.1}{(S+0.1)^2+9}$ into a digital IIR Filter using bilinear transformation. The digital filter resonant Frequency wr = $\frac{\Pi}{4}$	r should have a	7	
3.	a)	Explain in detail the LMS algorithm for direct FIR filters.		7	
	b)	What is the need for adaptivity? Give some examples of applications Filtering is done.	where adaptive	7	
4.	a)	Explain the architecture of TM5320C5X DSP processor.		7	
	b)	State the features of TM5320C5X DSP processor. Explain pipeline & in DSP processor.	c Parallel processing	7	
5.	a)	A low pass filter has the desired response as given. $H_d(e^{i\omega}) = e^{-i3\omega} 0 \le \omega < \frac{\Pi}{2}$ $= 0 \frac{\Pi}{2} \le \omega \le \Pi$		7	
		Determine the filter coefficients h(n) For M=7, using Type – I freque	ency sampling		

b) What are the effects of finite word length in digital Filters?

technique.

7

6. a) Determine the inverse z-transform of the following X (2) by the partial fraction expansion 7 method

 $X(z) = \frac{z+2}{2z^2 - 7z + 3}$ If the Roc are a) |z| > 3b) $|z| < \frac{1}{2}$

b) Determine the DFT of the sequence

$$x(n) = \frac{1}{5} \text{ for } -1 \le n \le 1$$
$$= 0 \quad \text{otherwise.}$$

- 7. a) Design a bandpass filter to pass frequency in the range 1 -2 rad using hanning window 7 M=5.
 - b) An analog Filter has the following system function. Convert this filter into a digital filter
 7 using backward difference for the derivative.

7

7

7

$$H(s) = \frac{1}{(S+0.1)^2 + 9}$$

8. a) Explain the AR, MA and ARMA models.

 b) Compute the autocorrelation of the signal. x(t) = K cos[2π F_ct + φ]
 Where K & F_c are constants. φ is random variable which is uniformly distributed over the interval [-Π,Π]
