

Class Test

Time - 1 hr , FM - 15

- ① show that Discrete time sinusoids whose frequencies are separated by 2π are identical 1
- ② Explain the steps involved in Analog to Digital Conversion 2
- ③ consider the analog signal

$$x_a(t) = 3 \cos 2000\pi t + 5 \sin 6000\pi t + 10 \cos 12000\pi t.$$

If the signal is sampled at a rate 5000 samples/sec, what is the discrete time ~~dis~~ signal obtained? 1

- ④ prove that folding and delaying are not commutative. 1
- ⑤ derive the conditions for stability and causality for an LTI system. 1

- ⑥ For Fourier transform prove the following properties

- (i) Duality (ii) conjugation (iii) Convolution in time domain 4
- (iv) multiplication in time domain.

- ⑦ For Z transform prove the following properties

- (i) Time reversal (ii) Convolution of two sequences 3
- (iii) Differentiation in Z domain.

⑧ (a) $X(z) = \frac{z^2}{(z-1)(z-0.5)^2}$, find res. 2

(ii) $X(z) = \log(1+az^{-1})$, $|z| > |a|$, find res.