

QP Code :15363

(3 Hours)

[ Total Marks : 100

- N. B. :** (1) Question No. 1 is **compulsory**.  
 (2) Attempt any **four** questions out of remaining **six** questions.  
 (3) **All** questions carry **equal** marks.  
 (4) Assume suitable data wherever necessary and state them clearly.

1. (a) Explain classification of Discrete time systems. 5  
 (b) Prove that DFT is orthogonal transform. 5  
 (c) Explain image fidelity criteria. 5  
 (d) Unit step signal is a power signal. Justify. 5
  
2. (a) Check whether the following systems are linear/nonlinear and Time variant/Time invariant. 10  
 (i)  $y(n) = e^{x(n)}$   
 (ii)  $y(n) = n x(n)$   
  
 (b) Find the Z transform of following signals and sketch ROC. 10  
 (i)  $x(n) = \left(\frac{1}{4}\right)^n u(n)$   
 (ii)  $x(n) = \left(\frac{1}{2}\right)^n u(-n-1)$
  
3. (a) Explain Decimation in time FFT algorithm with signal flow graph. 10  
 (b) Determine circular convolution of two sequences 10  
 $x_1(n) = \{1, 2, 3, 1\}$   
 $x_2(n) = \{4, 3, 2, 2\}$
  
4. (a) Explain region based image segmentation techniques. 10  
 (b) Explain image enhancement techniques in spatial domain. 10
  
5. (a) Explain various types of redundancies in an image. Specify techniques to remove redundancies. 10  
 (b) Construct improved gray scale quantization code for given data 10  
 $\{100, 110, 124, 124, 130, 200, 210\}$
  
6. (a) Explain trimmed average filtering and median filtering with example. 10

LM-Con.:8505-14.

[ TURN OVER