

Total No. of Questions : 6]

P511

SEAT No. :

[Total No. of Pages : 2

**TE/Insem/APR - 43**  
**T.E. (Computer Engineering)**  
**Digital Signal Processing Applications**  
**(2012 Pattern) (Semester - II)**

*Time : 1 Hour]*

*[Max. Marks : 30*

*Instructions to the candidates :*

- 1) *Attempt Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Assume suitable data if necessary.*

- Q1)** a) State the sampling theorem. What is aliasing? [5]  
b) Write down the form of N<sup>th</sup> order general difference equation of a DT system and express it for FIR and IIR system. [5]

OR

- Q2)** a) What do you mean by Impulse Response? Obtain it for the DT system [5]  
$$y(n) = 2x(n) - x(n - 2)$$
  
b) Obtain the linear convolution of following DT signals [5]  
 $x_1(n) = \{1, -2, 1\}$  and  $x_2(n) = \{-1, 0, 2\}$

- Q3)** a) State and prove the periodicity property of Fourier Transform (FT). [5]  
b) Derive the first stage of DIF FFT algorithm. [5]

OR

- Q4)** a) Obtain 4 point DFT for a DT sequence - [5]  
 $x(n) = \{1, 0, 2, -1\}$   
b) Compare between linear and circular convolution. [5]

*P.T.O.*

**Q5)** a) Why ROC need to specify along with ZT? What are the possible ROCs of ZT of any finite duration sequences? [5]

b) Obtain ZT of a DT signal using ZT properties where,  $x(n) = n.u(n-1)$  Specify the ROC. [5]

OR

**Q6)** a) Obtain ZT of two standard signals  $u(n)$  and  $\delta(n)$ . Plot its ROCs. [5]

b) What is a pole zero plot of ZT? Write down the steps to obtain the plot using System Function  $H(Z)$ . [5]

