

Total No. of Questions : 6]

SEAT No. :

[Total No. of Pages : 2

P59

TE/INSEM/APR-66

T.E. (Computer Engineering)

310253: DIGITAL SIGNAL PROCESSING APPLICATIONS

(2012 Pattern) (Semester - II)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the Candidates:

- 1) Answer 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) Draw and define standard signals used for system analysis i.e. unit step, delta and unit ramp signals. [5]

b) Define mean, standard deviation, SNR, histogram and probability density function. [5]

OR

Q2) a) Define Delay, time folding and time scaling operations on discrete time signal. [5]

b) Determine whether the following signals a periodic. [5]

i) $\sin(3n)$,

ii) $\cos(3\pi n)$,

iii) $\cos\left(\frac{2\pi n}{5}\right) + \cos\left(\frac{2\pi n}{7}\right)$,

iv) $\cos\left(\frac{n}{8}\right) + \cos\left(\frac{\pi n}{8}\right)$

P.T.O.

Q3) a) State the periodicity, linearity and time shift properties of DTFT? [5]

b) Explain and draw DIT and DIF FFT algorithms. [5]

OR

Q4) a) Calculate linear convolution of $x(n) = \{1\uparrow, 1, 1, 1\}$ and $h(n) = \{2\uparrow, 2\}$ using basic equation. [5]

b) State and prove the properties of twiddle factor and classify FFT algorithm. [5]

Q5) a) Obtain the Z-Transform of sequence delta function and unit step also sketch the ROC. [5]

b) Determine the z-transform of following sequences and ROC

i) $x_1(n) = \{1, 2, 3, 4, 5, 0, 7, 8, 9\}$ ii) $x_2(n) = \{1, 2, 3, 4\uparrow, 5, 0, 7, 8, 9\}$ [5]

OR

Q6) a) State and explain any two properties of z-transform. [5]

b) State and explain z-transform and initial value theorem. [5]