

Total No. of Questions : 6]

SEAT No. :

P258

[Total No. of Pages : 2

Oct. - 16/B.E./ Insem. - 131
B.E. (Electrical)
DIGITAL SIGNAL PROCESSING
(2012 Pattern)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) *Solve 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.*
- 4) *Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*

- Q1)** a) Give the detail classification of Discrete Time System. [6]
b) State and explain sampling theorem. [4]

OR

- Q2)** Consider the DTS as below. [10]
 $y(n) = 3y^2(n-1) - nx(n) + 4x(n-1) - 2x(n+1)$ whether the system is linear?
Shift invariant? Causal?

- Q3)** If z-transform of $x(n) \xrightarrow{z} \frac{z}{z^2 + 4}$, find z-transform of following functions using properties of z-transform. [10]
i) $2^n x(n)$
ii) $x(-n)$

OR

- Q4)** a) State z-transform and its ROC (significance). [3]
b) Find inverse z-transform of following function for ROC $|z| > 3$
 $X(z) = \frac{z+2}{2z^2 - 7z + 2}$ using partial fraction. [7]

P.T.O.

- Q5)** a) State and prove linearity and time shifting properties of DTFT. [6]
b) Explain first order response of discrete time system. [4]

OR

Q6) Find DTFT of following signals. [10]

i) $x(n) = \{1, -1, 2, 2\}$

ii) $x(n) = (0.5)^n u(n) + (2)^n u(-n-1)$

