**Signals and Systems (CT 203)**

Tutorial Sheet-15 DA-IICT, Gandhinagar.

1. Find the Z-transform of following sequences and plot their ROC
   a) $x(n) = -\alpha^n u(-n-1)$
   b) $x(n) = \alpha^n u(n)$
   c) $x(n) = \alpha^n u(n) + b^n u(-n-1)$

2. Find the Z-transform of
   i) $x_1(n) = \cos(\omega_o n) u(n)$
   ii) $x_2(n) = \sin(\omega_o n) u(n)$

3. Prove *convolution* property of Z-transform

4. Using scaling property, find the Z-transform
   i) Z $\mathbb{Z}\{a^n \cos(\omega_o n) u(n)\}$
   ii)Z $\mathbb{Z}\{a^n \sin(\omega_o n) u(n)\}$

5. Using power series expansion method, find the inverse Z-transform $X(z) = \frac{1}{1-az^{-1}}$ for case I) ROC -> $|z| > |a|$ and case II ROC -> $|z| < |a|$