

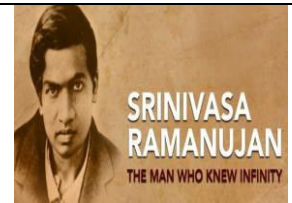


**SRM Institute of Science and Technology  
Kattankulathur**

**DEPARTMENT OF MEATHEMATICS**

**18MAB201T Transforms and Boundary Value Problems**

**UNIT – V : Z Transforms  
Tutorial Sheet - 14**



Sl.No.	Questions	Answer
<b>Part – B</b>		
1	Find the z-transforms of $\sin \frac{n\pi}{2}$ .	$z \left\{ \sin \frac{n\pi}{2} \right\} = \frac{z}{z^2 + 1}$
2	Find the z-transforms of $\sin^3 \left( \frac{n\pi}{6} \right)$ .	$z \left\{ \sin^3 \left( \frac{n\pi}{6} \right) \right\} = \frac{3z}{4(z^2 - z\sqrt{3} + 1)} - \frac{z}{4(z^2 + 1)}$
3	Find the z-transforms of $\sin^2 \left( \frac{n\pi}{4} \right)$ .	$z \left\{ \sin^2 \left( \frac{n\pi}{4} \right) \right\} = \frac{z}{2(z-1)} - \frac{z^2}{2(z^2 + 1)}$
4	Use initial value theorem to find $f(0)$ when $\bar{f}(z) = \frac{ze^{aT}(ze^{aT} \cos bT)}{z^2 e^{2aT} - 2ze^{aT} \cos bT + 1}$ .	$f(0) = 1$
5	Use final value theorem to find $f(\infty)$ when $\bar{f}(z) = \frac{Tze^{aT}}{(ze^{aT} - 1)^2}$ .	$f(\infty) = 0$
<b>Part – C</b>		
6	Find the inverse z-transforms of (i) $\frac{z^2 + z}{(z-1)^2}$ (ii) $\frac{2z^2 + 4z}{(z-2)^3}$ by long division method.	(i) $f(n) = 2n + 1$ (ii) $f(n) = n^2 2^n$
7	Find the inverse z-transform of $\frac{1+2z^{-1}}{1-z^{-1}}$ by long division method.	$f(n) = 1 + 2u(n-1)$
8	Find the inverse z-transform of $\frac{5z}{(2z-1)(z-3)}$ by partial fraction method.	$f(n) = 3^n - \frac{1}{2^n}$
9	Find the inverse z-transform of $\frac{z^2 + 2z}{(z-1)(z-2)(z-3)}$ by partial fraction method.	$f(n) = \frac{3}{2} - 4 \cdot 2^n + \frac{5}{2} \cdot 3^n$
10	Find the inverse z-transform of $\frac{4z^2 - 12z}{z^3 - 3z + 2}$ by partial fraction method.	$f(n) = \frac{20}{9} - \frac{8}{3}n - \frac{20}{9}(-2)^n$