DIFFERENTIAL EQUATIONS AND TRANSFORMS (BMAT102L)
(WINTER SEMESTER 2021-2022)

Module – 7 Z Transform

Tutorial Sheet 1

1) Find the Z-transform of the following sequences

   a) $n\,2^n$
   b) $2^n\,sin\,\frac{n\pi}{2}$
   c) $n(n-k)$
   d) $2^n\,\delta\,(n-1)$
   e) $3\,2^n + 4\,(-1)^n$
   f) $2^{n-1} + \frac{1}{2}(4^n - 3^n)$
   g) $n(n-1)2^n$
   h) $\frac{1}{n!}(a^n + a^{-n})$
   i) $na^n cos\,n\theta$
   j) $n(n-1)(n-2)$

2) Find the Z-transform of
   a) e^{-3t-7}
   b) $e^{-t}t^2$
   c) $e^{-t}cos2t$
   d) cos (2t+T)
   e) $e^{-2t}cos3t$
   f) $2^n\delta(n-2)$
   g) $\frac{1}{2}^n\,u(n)$
   h) n^3

3) Find the inverse Z-transform of the following sequence
   a) $\frac{z}{(z-1)(z-2)}$
   b) $\frac{z^2+2z}{(z-1)(z-2)(z-3)}$
   c) $\frac{z^2-3z}{z^2-3z+10}$
   d) $\frac{z^2(z-1)}{(z^2+1)^2}$