**Department of Electronics & Communication Engineering**

**Indian Institute of Technology Roorkee**

U**ECN 203 – Signals & Systems (DG)**

**Tutorial #2**

1. Find the DTFT of each of the following sequences:

(a)  (b)  (c) 

1. If *X*(Ω) is the DTFT of a sequence *x*[*n*], find the DTFT of

(a) *x*\*[−*n*] (b) *x*[2*n* + 1]

1. Find the inverse DTFT of

(a)  (b) 

1. Let x[n] be the sequence



Evaluate the following without explicitly finding X(Ω):

(a)  (b) 

1. A continuous-time filter has a system function

If the corresponding impulse response is sampled to form a discrete-time system with a unit sample response , find the value of so that at is 6 dB down from its maximum value at .

1. A major problem in recording ECG signal is the appearance of 60 Hz power line interference in the output. In order to remove this interference, the recorded output analog signal is sampled at Nyquist sampling rate and then processed in a digital filter described by the difference equation

Assuming that the output analog signal is bandlimited to 1 kHz, determine suitable values for and so that the interference is removed from the recorded signal.