1. What is sampling? Mathematically show how aliasing occurs.
2. Briefly explain multidimensional and multichannel signals with proper examples.
3. Consider the signal: $x(t) = 4\cos 450\pi t + 7\cos 120\pi t + 6\cos 550\pi t$
    i. What is the Nyquist rate of this signal?
    ii. Evaluate the discrete-time signal at a sampling rate Fs = 200 samples/sec
4. Determine whether the following signals are periodic or not? If periodic determine their fundamental period as well:
    a. $\cos 5\pi n$
    b. $\sin 3n$
    c. $x(n) = 3\cos(5t+\pi/6)$
5. Consider the signal: x(n) = {...,0,0,2,1,3,-2,-1,**-4**,1,2,-3,-1,-2,0,0,....} [Bold underlined number marks the center point]
    a. Determine and sketch the even parts of x(n).
    b. Determine and sketch the odd parts of x(n).
    c. Determine and graphically show the response of the system described by
    $$y(n) = -x(-2n+2)$$
    d. Determine and graphically show the response of the system described by
    $$y(n) = x(-n/2-2)$$