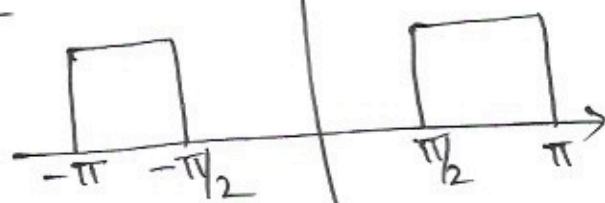


## ANSWER ALL QUESTIONS

1. Calculate Inverse Z-transform for [4m]  

$$X(z) = \frac{z^3 + z^2}{(z-1)(z-3)} \quad \text{Roc } |z| > 3$$
2. Find the IDFT of the sequence [6M]  

$$X(K) = \{4, 1 - j2.414, 0, 1 - j0.414, 0, 1 + j0.414, 0, 1 + j2.414\}$$
 using DIT algorithm.
3. Design FIR filter without window (for  $N=9$ ) [7M]  
 for  $H(e^{j\omega})$   

4. Draw direct form-II realization of [3M]  

$$H(z) = \frac{1 - 0.5z^{-1}}{1 - 0.7z^{-1} + 0.3z^{-2}}$$
5. Explain LTI model of speech production and obtain vocal tract system function. [4m]
6. Find the impulse response of discrete system [4m]  

$$y(n) - y(n-1) + \frac{3}{16} y(n-2) = x(n) - \frac{1}{2} x(n-1)$$
7. Give the example for [2M]  
 (i) unstable system function  
 (ii) power signal.