陆昊融 518370910194 王世博 518370910109 罗辰昊 518370910038
周维凯 518021911039 徐晟元 518370910200 Group15

(c)

$$W_0 = 2\pi f = 2400\pi$$

From the table, the coefficient of the fourier series is

$$C_0 = \frac{1}{2}, \quad C_k = j \cdot \frac{1}{2\pi k}$$

Thus. $X(w) = \sum_{k=-\infty}^{\infty} 2\pi \cdot C_k \cdot \delta(w - kw_0)$

Since the filter removes the component above 5k Hz.

We only consider $w \in [-5000, 5000]$

$$Y(w) = \frac{1}{2}\pi[\delta(w-w_c)+\delta(w+w_c)] + \frac{1}{2}[X(w-w_c)+X(w+w_c)]$$

$$= \frac{1}{2}\pi[\delta(w-2000\pi)+\delta(w+2000\pi)]$$

$$+ \sum_{\substack{k=-4 \\ k\neq 0}}^{4} \frac{j}{2k}[\delta(w-2.4k\pi-2000\pi)+\delta(w-2.4k\pi+2000\pi)]$$

(2)