$C_m (m == 2):$

$$C_2 = \frac{1}{8} \sum_{n=0}^{7} f(nT_S) e^{-j\frac{2(2)\pi n}{8}}$$

$$= \frac{1}{8}\left(1e^{-j(2)2\pi(0)/8} + 1e^{-j(2)2\pi(1)/8} + 1e^{-j(2)2\pi(2)/8} \right.$$
$$\left. + 1e^{-j(2)2\pi(3)/8} \right)$$

$$= \frac{1}{8}\left(1 - j - 1 + j \right)$$

$$= \frac{1}{8}\left(1 - 1 + j - j \right)$$

$$= \frac{1}{8}(0)$$

$$\boxed{= 0}$$

$C_m (m == 3):$

$$C_3 = \frac{1}{8} \sum_{n=8}^{7} f(nT_S) e^{-j\frac{(3)2\pi n}{8}}$$

$$= \frac{1}{8}\left(1e^{-j\frac{(3)2\pi(0)}{8}} + 1e^{-j\frac{(3)2\pi(1)}{8}} + 1e^{-j\frac{(3)2\pi(2)}{8}} + 1e^{-j\frac{(3)2\pi(3)}{8}} \right)$$

$$= \frac{1}{8}\left(1 - 0.7071 - j0.7071 + j + 0.7071 - j0.7071 \right)$$

$$= \frac{1}{8}\left(1 - j0.442 \right)$$

$$\boxed{= 0.1250 - j0.0518}$$

$C_m (m == 4):$

$$C_4 = \frac{1}{8} \sum_{n=0}^{7} f(nT_s) e^{-j\frac{(4)2\pi n}{8}}$$

$$= \frac{1}{8}\left(1e^{-j\frac{(4)2\pi(0)}{8}} + 1e^{-j\frac{(4)2\pi(1)}{8}} + 1e^{-j\frac{(4)2\pi(2)}{8}} + 1e^{-j\frac{(4)2\pi(3)}{8}} \right)$$

$$= \frac{1}{8}(1 - 1 + 1 - 1)$$

$$\boxed{= 0}$$

Section 3:

$$yy = \sum_{m=0}^{N-1} Cm(m) \cdot e^{j2\pi mn/N}$$

$$= 0.5 + (0.125 - 0.3018j)e^{j2\pi n/8} + 0 + (0.125 - 0.0518j)e^{j6\pi n/8}$$

$$+ 0 + (0.125 + 0.0518j)e^{j10\pi n/8} + 0 + (0.125 + 0.3018j)e^{j14\pi n/8}$$