Solutions

2(g)

1 $i = i_1 + i_2 + i_3$

2 $i_1 + i_3 = i_2 + i_4 + i_5$

3 $i_1 + i_2 = 10$ mA, $i_1 = i_3 + i_4$, $i_3 + i_5 = 10$ mA and $i_2 + i_4 = i_5$

4 $i = 3$ mA

5 $i = 1$ mA

6 $i_1 = 5.67$ mA, $i_2 = 0.90$ mA

7 $i_1 = 4.06$ mA, $i_2 = 0.38$ mA, $i_3 = 0.11$ mA

8 $i_1 = 2.69$ mA, $i_2 = 1.92$ mA, $i_3 = 0.53$ mA

9 $i_1 = 5.90$ mA, $i_2 = 2.24$ mA, $i_3 = 1.17$ mA, $i_4 = 0.16$ mA

10 $i_1 = 3.64$ mA, $i_2 = 0.77$ mA, $i_3 = 0.24$ mA

3(g)

2 a $5H(t-7)$

b $H(t-5) - H(t-8)$

c $tH(t-1)$

d $2t\left[H(t-1) - H(t-2)\right]$

3 i $f(t) = t^3H(t)$, $g(t) = (t-2)^3\,H(t-2)$

5(f)

1 0.266, 0.276, 1.000

2 1.862, −1.862, 0, 0.549, 1.812, 7.601, no real solution

3 π, 5, π, 0.236

4 a 1.12 **b** 1.86 **c** 0.55

10 240.87 m

11 $s = \dfrac{T}{w}\left[\sinh\left(\dfrac{wx}{T}\right) - \tan^{-1}(\theta)\right]$

ME5 (extra)

18 b −60 m

10(f)

1 a 1.54 **b** $j\,1.17$ **c** $j\,0.76$ **d** $j\,11.55$

2 a −1 **b** $j\,0.89$ **c** $j\sqrt{3}$

8 a $x = 6.26$, $y = -9.72$ **b** $x = -9.75$, $y = -6.24$ **c** $x = 0$, $y = -1$

ME10 (extra)

21 a 1.543 **b** 1.543

22 ii $119.325 + j\,67.618$