

Answers 3B2 – Integrated digital electronics

1.

$$(b) T_A = \overline{ABC} + \overline{BC}$$

$$T_B = A + \overline{B} + C$$

$$T_C = \overline{AC} + A\overline{C}$$

$$(c) \overline{R} = \overline{CBA + C\overline{B}A + C\overline{B}A}$$

2.

$$D_1 = \sum(2,4,5,6,9,10)$$

$$D_2 = \sum(1,5,6,8,10)$$

3.

- (a) (i) Inverter A: for $V_{IN}=0$, $V_{OH}=4V$
Inverter B : for $V_{IN}=0$, $V_{OH}=5V$
(ii) Inverter A: $V_{IN}=V_{DD}$, $V_{OL}=0.19V$
Inverter B: $V_{IN}=V_{DD}$, $V_{OL}=0V$

$$(b) \frac{W_3}{L_3} = 4$$

- (c) Inverter A: $T_{del} = 2.1\mu s$
Inverter B: Total delay = 52 ns