

Version SH/5

Numerical answers

Q1

(a)(i) $8.57 \times 10^5 \Omega\text{m}$

(ii) $E_{F_i} - E_V = 0.710 \text{ eV}$; $E_g = 1.344 \text{ eV}$

(iii) 223 fs

(iv) 92 nm

(b)(ii) $E_F - E_V = 0.115 \text{ eV}$

Q2

(a)(i) 0.75 eV ; $p_{n0} = 2.2 \times 10^8 \text{ m}^{-3}$; $n_{p0} = 2.2 \times 10^{11} \text{ m}^{-3}$

(ii) $5.5 \times 10^{19} \text{ m}^{-3}$

(b)(i) decrease by $1/\sqrt{2}$

Q3

(b) 177 kV/m

(c)(i) 0.93 V

(ii) -0.35 V

(iii) $8.4 \times 10^{-4} \text{ F/m}^2$

Q4

(a)(ii) 17.1 V