Solution MCQ

Exercise 1: Multiple choice questions

a) What is the typical thickness of n-type wafers used for solar cells?

- 90 µm
- 120 µm
- 200 µm

Solution:

200 µm

b) What does NOCT (Nominal Operating Cell Temperature) mean?

- Radiation: $800\,\mathrm{W\,m^{-2}}$, air temperature: 20 °C, wind speed: $1\,\mathrm{m\,s^{-1}}$, free mounting, V_{OC} conditions
- Radiation: $1000\,\mathrm{W\,m^{-2}}$, air temperature: 25 °C, wind speed: $1\,\mathrm{m\,s^{-1}}$, free mounting, V_{OC} conditions
- Radiation: $800\,\mathrm{W\,m^{-2}}$, air temperature: 20 °C, wind speed: $1.5\,\mathrm{m\,s^{-1}}$, free mounting, V_{OC} conditions

Solution:

Radiation: $800\,\mathrm{W\,m^{-2}}$, air temperature: 20 °C, wind speed: 1 m/s, free mounting, V_{OC} conditions

c) What are typical (approximate) V_{OC} values for Al-BSF, PERC and Silicon heterojunction (SHJ) technologies?

- 680 mV (Al-BSF), 710 mV (PERC), 770 mV (SHJ)
- 600 mV (Al-BSF), 640 mV (PERC), 700 mV (SHJ)
- 640 mV (Al-BSF), 680 mV (PERC), 740 mV (SHJ)

Solution:

640 mV (Al-BSF), 680 mV (PERC), 740 mV (SHJ)

d) What are typical J_{SC} values for a SHJ single junction cell and a SHJ as bottom cell in a 2-terminal tandem device, respectively?

- $40\,\mathrm{mA\,cm^{-2}}$ and $40\,\mathrm{mA\,cm^{-2}}$
- $40\,\mathrm{mA\,cm^{-2}}$ and $20\,\mathrm{mA\,cm^{-2}}$

- $20\,\mathrm{mA\,cm^{-2}}$ and $40\,\mathrm{mA\,cm^{-2}}$

Solution:

$40\,\mathrm{mA\,cm^{-2}}$ for SHJ and $20\,\mathrm{mA\,cm^{-2}}$ in a 2-terminal tandem device

e) What is the typical thickness of anti-reflective coating (ARC) for solar cells?

- 50 nm
- 70 nm
- 100 nm

Solution:

70 nm