Q.13 A 5.0 m mol dm^{-3} aqueous solution of KCl has a conductance of 0.55 mS when measured in a cell of cell constant 1.3 cm^{-1}. The molar conductivity of this solution is _____ $mSm^2\ mol^{-1}$. (Round off to the Nearest Integer).

16th March Evening Shift 2021

Ans 13.

$$\text{Conductance} = \frac{Conductivity}{Cell\ constant}$$

$$\therefore \text{Conductivity} = 0.55 \times 10^{-3} \times 1.3\ S\ cm^{-1}$$

$$\text{Molar conductivity} = \frac{Conductivity\ (S\ cm^{-1}) \times 1000}{Molarity\ (mol/L)}$$

$$= \frac{0.55 \times 10^{-3} \times 1.3 \times 100}{5 \times 10^{-3}}$$

$$= 143\ S\ cm^2\ mol^{-1}$$

$$= 14.3\ mS\ m^2\ mol^{-1}$$

$$\approx 14\ mS\ m^2\ mol^{-1}$$