**Example 2:** For a field pumping test, a well was sunk through a horizontal stratum of sand 14.5 thick and underlain by a clay stratum.Two observation wells were sunk at horizontal distances of 16 m and 34 m respectively from the pumping well.The initial position of the water table was 2.2 m below ground level.

At a steady-state pumping rate of 1850 litres/min, the drawdowns in the observation wells were found to be 2.45 m and 1.20 m respectively. Calculate the coefficient of permeability of the sand.

Solution:
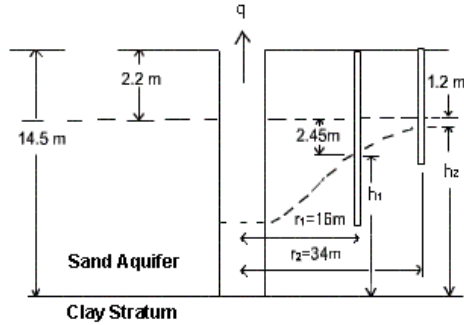
$$k = \frac{q.\log_e(\frac{r_2}{r_1})}{r(h_2^2 - h_1^2)}$$

q = 1850 litres/min = $\frac{1850 \times 10^{-3}}{60} m^3/s$

r$_1$ = 16 m
r$_2$ = 34 m
h$_1$ = 14.5 - 2.2 - 2.45 = 9.85 m
h$_2$= 14.5 - 2.2 - 1.2 = 11.1 m

$$k = \frac{\frac{1850 \times 10^{-3}}{60} \times \log_e(\frac{34}{16})}{r[(11.1)^2 - (9.85)^2]} = 2.82 \times 10^{-4} \text{ m/s} = 1.41 \times 10^{-2} \text{ cm/s}$$