The graph between two temperature scales A and B is shown in Fig. 11.1. Between upper fixed point and lower fixed point there

are 150 equal division on scale A and 100 on scale B.
The relationship for conversion between the two scales is given by

(a) $\frac{t_A - 180}{100} = \frac{t_B}{150}$

(b) $\frac{t_A - 30}{150} = \frac{t_B}{100}$

(c) $\frac{t_B - 180}{150} = \frac{t_A}{100}$

(d) $\frac{t_B - 40}{100} = \frac{t_A}{180}$

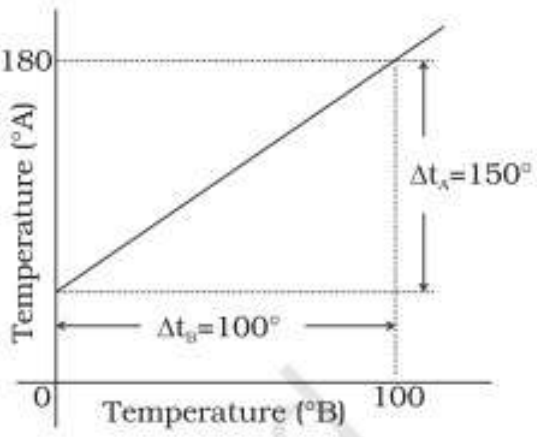

Fig. 11.1

From graph of T_A

Lower fixed point (LFP) = 30°

Upper fixed point (UFP) = 180°

Similarly, for T_B

UFP = 100° ; LFP = 0°

By using formula for conversion of temperature from one scale to another;

$$\Rightarrow \frac{t_A - (LFP)_A}{(UFP)_A - (LFP)_A} = \frac{t_B - (LFP)_B}{(UFP)_B - (LFP)_B}$$

$$\Rightarrow \frac{T_A - 30}{180 - 30} = \frac{T_B - 0}{100 - 0}$$

$$\Rightarrow \boxed{\frac{t_A - 30}{150} = \frac{t_B}{100}} \longrightarrow \text{option (b)}$$