17. A solid body of constant heat capacity 1 J/°C is being heated by keeping it in contact with reservoirs in two ways :

(i) Sequentially keeping in contact with 2 reservoirs such that each reservoir supplies same amount of heat.

(ii) Sequentially keeping in contact with 8 reservoirs such that each reservoir supplies same amount of heat.

In both the cases body is brought from initial temperature 100°C to final temperature 200°C. Entropy change of the body in the two cases respectively is :

(1) $ln2, 2ln2$

(2) $2ln2, 8ln2$

(3) $ln2, 4ln2$

(4) $ln2, ln2$

No option is correct

for a solid

$$dS = C\frac{dT}{T}$$

$$S_2 - S_1 = C \ln \frac{T_2}{T_1}$$

Change in entropy depends only on initial & final state

If $T_1 = 100K$, $T_2 = 200K$, then option (4) would be correct. But there is a mistake in the question.

$$\therefore S_2 - S_1 = C \ln \left(\frac{200+273}{100+273}\right) \qquad C = 1$$

$$\Delta S = \ln \left(\frac{473}{373}\right)$$