

When 100 g of a liquid A at 100°C is added to 50 g of a liquid B at temperature 75°C , the temperature of the mixture becomes 90°C . The temperature of the mixture, if 100 g of liquid A at 100°C is added to 50 g of liquid B at 50°C , will be : (JEE MAIN 2019)

A 60°C

B 70°C

C 85°C

D 80°C

Let C_A and C_B be the specific heat capacities of the liquid A and B respectively.

By using the principle of calorimetry; i.e. → Heat lost by hot body = Heat gained by cold body for an isolated system

Case 1: $(100)C_A(100-90) = (50)C_B(90-75)$ — (1)

Case 2: $(100)C_A(100-T) = (50)C_B(T-50)$ — (2)

On dividing (1) by (2)

$$\Rightarrow \frac{10}{100-T} = \frac{15}{T-50}$$

$$\Rightarrow \boxed{T = 80^\circ\text{C}}$$