

Previous year JEE question 1

If

$$C_1, C_2, C_3, \dots$$

represent the speeds of

$$n_1, n_2, n_3, \dots$$

molecules, then the root mean square speed is?

A)

$$(n_1 C_1^2 + n_2 C_2^2 + n_3 C_3^2 + \dots) / (n_1 + n_2 + n_3 + \dots)$$

B)

$$(n_1 C_1^2 + n_2 C_2^2 + n_3 C_3^2 + \dots) / (n_1 + n_2 + n_3 + \dots)$$

C)

$$(n_1 C_1^2)^{1/2} n_1 + (n_2 C_2^2)^{1/2} n_2 + (n_3 C_3^2)^{1/2} n_3 + \dots$$

D)

$$[(n_1 C_1 + n_2 C_2 + n_3 C_3 + \dots) / (n_1 + n_2 + n_3 + \dots)]^{1/2}$$

**Correct Answer:** A

**Solution :**

Root mean square speed

$$= [(n_1 C_1^2 + n_2 C_2^2 + n_3 C_3^2 + \dots) / (n_1 + n_2 + n_3 + \dots)]^{1/2}$$