

Examples

to convert 2 min to seconds

$$2 \text{ min} = (2 \text{ min})(1) = (2 \text{ min})\left(\frac{60 \text{ s}}{1 \text{ min}}\right) = 120 \text{ s}$$

to convert 15 inch to centimeters

$$15.0 \text{ in.} = (15.0 \text{ in.})\left(\frac{2.54 \text{ cm}}{1 \text{ in.}}\right) = 38.1 \text{ cm}$$

to convert 15 h to seconds

$$\begin{aligned} 15 \text{ h} &= 15 \text{ h} \times 1 = 15 \text{ h} \times \left(\frac{60 \text{ min}}{1 \text{ h}}\right) = 900 \text{ min} \\ &= 900 \text{ min} \times 1 = 900 \text{ min} \times \left(\frac{60 \text{ s}}{1 \text{ min}}\right) = 54000 \text{ s} \end{aligned}$$

to convert 10 km/h to m/s`

$$\begin{aligned} 10 \text{ km/h} &= 10 \text{ km/h} \left(\frac{1000 \text{ m/h}}{1 \text{ km/h}} \right) = 10000 \text{ m/h} \\ &= 10000 \text{ m/h} \left(\frac{1 \text{ m/s}}{3600 \text{ m/h}} \right) = \frac{100}{36} \text{ m/s} = \frac{100}{36} \text{ m/s} = 2.78 \text{ m/s} \end{aligned}$$

to convert 15 m/s to km/h

$$\begin{aligned} 15 \text{ m/s} &= 15 \text{ m/s} \left(\frac{1 \text{ km/s}}{1000 \text{ m/s}} \right) = 0.015 \text{ km/s} \\ &= 0.015 \text{ km/s} \left(\frac{3600 \text{ km/h}}{1 \text{ km/s}} \right) = 54 \text{ km/h} \end{aligned}$$

Samples of Exam Questions

Q.1 10^4 milliseconds is equal to:

(A) 10^3 s

(B) 10^2 s

(C) 1 s

(D) 10 s

(E) 10^{-1} s

Q.2 A cubic box with an edge of exactly 3 cm has a volume of: (volume = edge³)

(A) 10^{-6} m³

(B) 8×10^{-6} m³

(C) 2.7×10^{-5} m³

(D) 6.4×10^{-5} m³

(E) 4×10^{-6} m³

Q.3 The speed v in m/s of a car is given by $v = bt^3$ where the time t is in seconds. The unit of b is:

(A) m/s⁴

(B) ms

(C) m/s

(D) m/s³

(E) m/s²

$$(1) \quad 10^4 \text{ ms} = 10^4 \text{ ms} \left(\frac{1 \text{ s}}{1000 \text{ ms}} \right) = 10 \text{ s}$$

$$(2) \quad V = 3 \times 3 \times 3 = 27 \text{ cm}^3 = 27 \text{ cm}^3 \left(\frac{1 \text{ m}^3}{10^6 \text{ cm}^3} \right) \\ = 27 \times 10^{-6} \text{ m}^3 = 2.7 \times 10^{-5} \text{ m}^3$$

$$\text{m/s} = \text{unit}(b) \text{ s}^3 \text{ unit}(b) = \text{m/s}^4$$

Using the dimensional analysis:

$$(3) \quad [v] = [b][t^3] \Rightarrow \frac{L}{T} = [b] T^3 \Rightarrow [b] = \frac{L}{T^4}$$

Then the unit of b is m/s⁴

Q.1 The SI unit of acceleration is:

- (A) m/s^2 (B) s/m (C) kg m/s (D) m/s (E) kg

Q.2 A car is traveling at 15 m/s. The speed of this car is equivalent to:

- (A) 45 km/h (B) 20 km/h (C) 54 km/h (D) 11 km/h (E) 72 km/h

Q.3 A cube of edge 30.5 mm, its volume is:

- (A) $2.84 \times 10^{-5} \text{ m}^3$ (B) $2.84 \times 10^{-6} \text{ m}^3$ (C) $2.84 \times 10^{-4} \text{ m}^3$ (D) 28.4 m^3 (E) 2.84 m^3

Q.11 A cube of edge 30.5 mm, its volume is:

- (A) $2.84 \times 10^{-5} \text{ m}^3$ (B) $2.84 \times 10^{-6} \text{ m}^3$ (C) $2.84 \times 10^{-4} \text{ m}^3$ (D) 28.4 m^3 (E) 2.84 m^3

Q.1 A man of mass 50 kg. His weight is:

- (A) 490 N (B) 50 N (C) zero (D) 98 N (E) 980 N

Q.2 1 Newton is equivalent to:

- (A) 9.8 kg.m/s^2 (B) 1 kg. m/s^2 (C) 1 kg of mass (D) 1 kg of force (E) none of these

Q.1 The SI unit of velocity is:

- (A) m/s^2 (B) s/m (C) kg m/s (D) m/s (E) kg

Q.2 A car is traveling at 20 m/s. The speed of this car is equivalent to:

- (A) 40 km/h (B) 20 km/h (C) 10 km/h (D) 11 km/h (E) 72 km/h

Q.3 A cube of edge 47.5 mm, its volume is:

- (A) 43 m^3 (B) 0.473 m^3 (C) $1.072 \times 10^{-4} \text{ m}^3$ (D) 47.3 m^3 (E) 475 m^3