

Physics

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Matter & Energy

+ relationship between them

Measurement

Important in Physics

You Measure Quantities

SI Units

Examples

Time

... second (*s*)

Mass

... kilogram (*kg*)

Length

... metre (*m*)

Current

... ampere (*A*)

SI System Of Units

Basic Units (5)

metre (m)

kilogram (kg)

second (s)

ampere (A)

kelvin (K)

Derived Units

newton (N)

metre per second ($m s^{-1}$)

cubic metre (m^3)

kilogram per metre ($kg m^{-1}$)

etc.

Derived Units

e.g. ... for Density = ??

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

$$\text{units of density} = \frac{\text{units of mass}}{\text{units of volume}}$$

$$\frac{\text{kg}}{\text{m}^3}$$

$$\text{kg m}^{-3}$$

$$\frac{1}{x^3} = x^{-3}$$

Powers Of Ten

milli-

kilo-

giga-	G	10^9
mega-	M	10^6
kilo-	k	10^3
centi-	c	10^{-2}
milli-	m	10^{-3}
micro-	μ	10^{-6}
nano-	n	10^{-9}
pico-	p	10^{-12}

mega-

nano-

Powers Of Ten

10^9	giga-	G
10^6	mega-	M
10^3	kilo-	k
10^{-2}	centi-	c
10^{-3}	milli-	m
10^{-6}	micro-	μ
10^{-9}	nano-	n
10^{-12}	pico-	p

Express in standard SI units:

(i) 12 mm

(ii) 40 mJ

(iii) 7 MW

$$\begin{aligned} \text{(i) } 12 \text{ mm} &= 12 \times 10^{-3} \text{ m} \\ &= 1.2 \times 10^{-2} \text{ m} \end{aligned}$$

$$\begin{aligned} \text{(ii) } 40 \text{ mJ} &= 40 \times 10^{-3} \text{ J} \\ &= 4 \times 10^{-2} \text{ J} \end{aligned}$$

$$\text{(iii) } 7 \text{ MW} = 7 \times 10^6 \text{ W}$$