

Physical quantities and Measurement.

Q. 11) Convert the following quantities as indicated:

a) $2500 \text{ kg} = \dots\dots\dots \text{ metric tonne.}$

$\Rightarrow$ We know $\frac{1}{1000} \text{ kg} = 1 \text{ metric tonne}$

$$\therefore, 2500 \text{ kg} = \frac{2500}{1000} \text{ metric tonne}$$

$$= \underline{\underline{2.5 \text{ metric tonne.}}}$$

b) $150 \text{ kg} = \dots\dots\dots \text{ quintal.}$

$\Rightarrow$ We know $\frac{1}{100} \text{ kg} = 1 \text{ quintal}$

$$\therefore, 150 \text{ kg} = \frac{150}{100}$$

$$= \underline{\underline{1.5 \text{ quintal.}}}$$

c) $10 \text{ lb} = \dots\dots\dots \text{ kg.}$

$\Rightarrow$ We know $1 \text{ lb} = 453.59 \text{ g}$
 $= \frac{453.59}{1000} \text{ kg}$

$$= 0.45359 \text{ kg.}$$

$$\therefore, 10 \text{ lb} = 0.45359 \times 10 \text{ kg}$$
$$= \underline{\underline{4.5359 \text{ kg}}}$$

d) $2500\text{ g} = \dots\dots\dots \text{ kg}.$

$\Rightarrow$ We know $1000\text{ g} = 1\text{ kg}.$

$\therefore, 2500\text{ g} = \frac{2500}{1000}$

$= 2.5\text{ kg}$

e) $0.01\text{ kg} = \dots\dots\dots \text{ g}$

$\Rightarrow$ We know $1\text{ kg} = 1000\text{ g}$

$\therefore, 0.01\text{ kg} = 1000 \times 0.01\text{ g}$

$= 10\text{ g}$

f) $5\text{ mg} = \dots\dots\dots \text{ kg}$

$\Rightarrow$ We know $1\text{ mg} = \frac{1}{1000000}\text{ kg}$

$\therefore, 5\text{ mg} = \frac{5}{1000000}\text{ kg}$

$= 5 \times 10^{-6}\text{ kg}.$

Q.12) Name the instrument which is commonly used to measure the mass of a body. State how it is used.

$\Rightarrow$ The commonly used instrument to measure the mass of a body is beam balance.

For measuring, the beam balance is first held up. On holding the balance, it is ensured that when there is nothing on either pan, the beam is horizontal. The body whose

mass is to be measured is placed on the left pan and the standard weights are placed on the right pan. They are adjusted so that the beam is horizontal on holding the balance up. The total of the standard weights gives the mass of the given body.

Q.13) Define one Kilogram, the S.I. unit of mass. How is it related to i) quintal ii) metric tonne and iii) gram?

⇒ One Kilogram at present is defined as the mass of 1 litre (=1000 ml) of water at 4°C.

$$i) 1 \text{ Kilogram} = \frac{1}{100} \text{ quintal}$$

$$ii) 1 \text{ Kilogram} = \frac{1}{1000} \text{ metric tonne.}$$

$$\text{and } iii) 1 \text{ Kilogram} = 1000 \text{ g.}$$

Q.14) Name and define the S.I. unit of time. How is it related to i) minute ii) hour iii) day and iv) year?

⇒ S.I. unit of time is second.

One second is defined as $\frac{1}{86400}$

part of a mean solar day. i.e., $1 \text{ s} = \frac{1}{86400} \times$

1 mean solar day.

Relation :-

$$i) 1 \text{ minute} = 60 \text{ s}$$

$$ii) 1 \text{ hour} = 3600 \text{ s}$$

$$iii) 1 \text{ day} = 86400 \text{ s. and}$$

$$iv) 1 \text{ year} = 3.15 \times 10^7 \text{ s.}$$

Q. 15. Name two devices used to measure the short time interval of an event.

⇒ Stop clock and stop watch.

Q. 16. Express in second i) 3 minute 15 second and ii) 5 hour 2 minute 5 second.

⇒ i) 3 minute 15 second

$$= (3 \times 60 + 15) \text{ s}$$

[As 1 min = 60 s]

$$= (180 + 15) \text{ s}$$

$$= 195 \text{ s} \quad \underline{\text{Ans}}$$

ii) 5 hour 2 minute 5 second.

$$= (5 \times 60 \times 60) \text{ s} + (2 \times 60) \text{ s} + 5 \text{ s}$$

$$= 18000 \text{ s} + 120 \text{ s} + 5 \text{ s} \quad [\text{As } 1 \text{ hr} = 60 \times 60 \text{ s}]$$

$$= 18125 \text{ second.} \quad [1 \text{ min.} = 60 \text{ s}]$$

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[Kindly note :- Question No. - 17 to 27 are omitted as 'measurement of temperature' and 'measurement of Area' are excluded from Syllabus.]