CH - 2

Book Exercise

A. 1. (a) False
(b) True
(c) True
(d) False
(e) True

22.7.21

Book Exercise

A. Objective Questions

2. (a) The S.I. unit of length is metre, of time is second, of mass is kilogram.

(b) °C is the unit of temperature.

(c) 1 metric tonne = 1000 kg.

(d) The zero mark in Celsius thermometer is the melting point of ice.

(e) The thermometer used to measure the human body temperature is called the clinical thermometer.

(f) The normal temperature of human body is 37°C or 98.6°F.

(g) The mass of an object is measured with the help of a beam balance.

Book Exercise

A.3.

| Column A | Column B |
|---|---|
| (a) length of a housing plot | – (iv) Measuring tape |
| (b) Breadth of a book | – (vi) Metre ruler |
| (c) Mass of an apple | – (ii) Beam ~~boo~~ balance |
| (d) Period of time for study | – (i) Clock |
| (e) Temperature of a body | – (iii) Thermometer |
| (f) Surface area of a leaf | – (v) Graph paper |

4. (a) (i) °C
(b) (i) 1 cm
(c) (ii) area
(d) ~~(i) m~~ (iii) mm
(e) (ii) °C

B. Short / Long Answer Questions

1. Measurement is ~~the~~ comparison of an unknown quatity with a known fixed ~~quat~~ quantity of the same kind. The value obtained on measuring a quantity is called its magnitude. The magnitude of a quantity is expressed as numbers in its unit.

2. Two characteristics of a unit are;
1. It should be of convenient size.
2. It must be universally accepted, i.e. its value must remain same at all places and at all ~~places~~ times.

3. In ~~so~~ our daily life we measure the following four basic physical ~~quotes.~~ quantities.
1. Length
2. Mass
3. Time
4. Temperature

4.

| Quantity | S.I unit | Symbol of S.I unit |
|---|---|---|
| (i) Length | metre | m |
| (ii) Mass | kilogram | kg |
| (iii) Time | ~~Second~~ second | s. |
| (iv) Temperature | kelvin | k |

5. One metre is defined as the distance travelled by light in air in $\frac{1}{299,792,458}$ of a ~~se~~ second

Multiple of metre = Kilometre
Submultiple of metre = Centimetre

6. (a) 12 inch = 1 foot

(b) 1 ft = 30.48 cm

(c) 100 cm = 1 m

$\therefore$ 1 cm = $\frac{1}{100}$ m

$\therefore$ 20 cm = $\frac{1}{100} \times 20$ m = 0.2 m

$\therefore$ 20 cm = 0.2 m

(d) 1 m = 100 cm

$\therefore$ 4.2 m = $100 \times \frac{42}{10}$ cm = 420 cm

$\therefore$ 4.2 m = 420 cm

(e) 1 km = 1000 m

$\therefore$ 0.2 km = 1000 × 0.2 m

= $\frac{1000 \times 2}{10}$ m = 200 m

$\therefore$ 0.2 km = 200 m

(f) 1 cm = 10 mm

$\therefore$ 0.2 cm = 10 × 0.2 mm

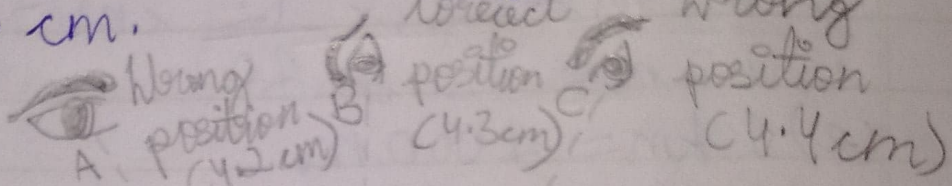
= $\frac{10 \times 2}{10}$ mm = 2 mm

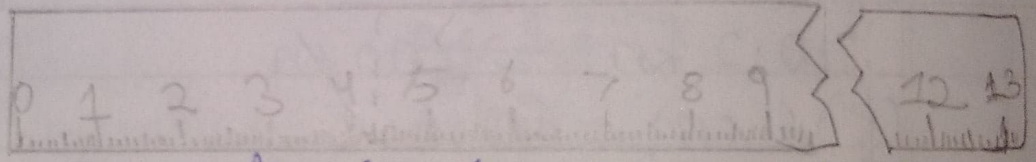
~~$\therefore$ 0.2 cm = 2 mm~~

$\therefore$ 0.2 cm = 2 mm

(eg) 1 yard = 0.91 m

7. To measure the length of a pencil using a metre ~~ruleer~~ ruler, place the metre ruler with its marking close to the object. Let PQ be a pencil. The end P of the pencil coincides with the zero mark on the ruler. The end Q of the pencil is read by ~~keeki~~ keeping the eye at the position 'B' vertically above the end Q. So the length of pencil is 4.3 cm.




Measuring the length of a rod PQ with a metre ruler

8. We will use a measuring tape to measure the perimeter of our playground. To measure the length of playground the tape is spread along the length of the curved area.

9. (a) Length of stick PS from
Position A = 3.4 cm
Position B = 3.2 cm
Position C = 3.00 cm
No they are not same.

(b) 'B' is the correct position of the eye.
Correct length of the stick PQ = 3.2 cm.

10. The mass of a body is the quantity of matter contained in it. The S.I. unit of mass is kilogram. In short form, it is written as kg.
In C.G.S. system, the unit of mass is gram (symbol g).
In F.P.S. system, the unit of mass is pound (symbol lb).

11. (a) 2500 kg = 2.5 metric tonne.
1000 kg = 1 metric tonne
1 kg = $\frac{1}{1000}$ metric tonne
$\therefore$ 2500 kg = $\frac{1}{1000} \times 2500$ metric tonne
$\therefore$ 2500 kg = 2.5 metric tonne

(b) 150 kg = 1.5 quintal
100 kg = 1 quintal
~~150 kg =~~
1 kg = $\frac{1}{100}$ quintal

$150\ kg = \frac{1}{100} \times 150$ quintal

$= 1.5$ quintal

$\therefore 150\ kg = 1.5$ quintal

(c) $10\ lb = 4.5359\ kg$

$1\ lb = 453.59\ g$

$= 453.59 \times \frac{1}{1000}\ kg$ $(\because 1\ kg = 1000\ g)$

$= 0.45359\ kg$

$\therefore 10\ lb = 0.45359 \times 10\ kg$

$= 4.5359\ kg$

$\therefore 10\ lb = 4.5359\ kg$

(d) $2500\ g = 2.5\ kg$

$1000\ g = 1\ kg$

$1\ g = \frac{1}{1000}\ kg$

$\therefore 2500\ g = \frac{1}{1000} \times 2500\ kg = 2.5\ kg$

$\therefore 2500\ g = 2.5\ kg$

(e) $0.01\ kg = 10\ g$

$1\ kg = 1000\ g$

$\therefore 0.01\ kg = 1000 \times 0.01\ g$

$= 1000 \times \frac{1}{100} g = 10 g$

$\therefore 0.01 kg = 10 g$

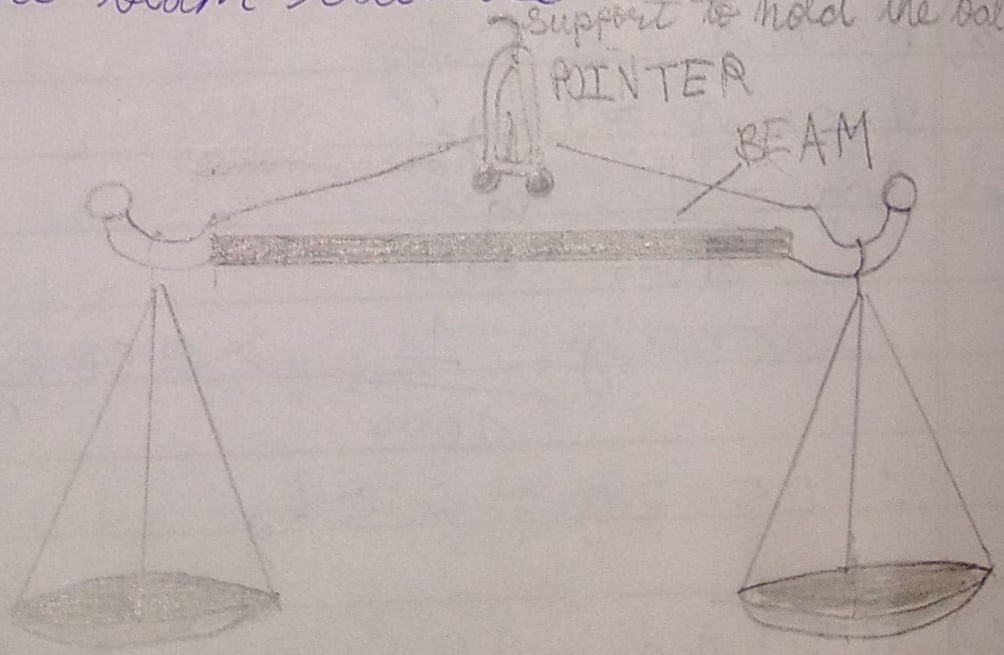
(f) $5 mg = 5 \times 10^{-6} kg$

$5 mg = \frac{5}{1000} g$ or $5 \times 10^{-3} g$

$\frac{5}{1000} g$ or $5 \times 10^{-3} g = \frac{5}{1000 \times 1000}$

or $5 \times 10^{-6} kg$

12. Instrument commonly used to measure the mass of a body, is the beam balance.



When we hold up the balance, we observe 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. The standard weight are put on the right pan. They are so adjusted that the beam is again horizontal on holding the balance up. The total of the standard weights gives the mass of the given body.

13. The mass of 1 litre of water at 4°C is taken as 1 kilogram.
1 quintalk = 100 kg
1 metric ton = 10 quintal = 1000 kg

14. ~~The~~ It

15. Two devices used to measure the short time interval of an event are
1. Stop watch
2. Stop clock

Book Exercise

16. (i) 3 minute 15 second

1 minute = 60 seconds

3 minutes 15 second = $60 \times 3 + 15$

$= 180 + 15$

$= 195$ seconds

(ii) 1 minute = 60 second

2 ~~min~~ minutes = $2 \times 60 = 120$ second

1 hour = 3600 second

5 hour = $3600 \times 5 = 18000$ second

5 hour 2 minutes and 5 second

$= 18000 + 120 + 5 = 18125$ seconds

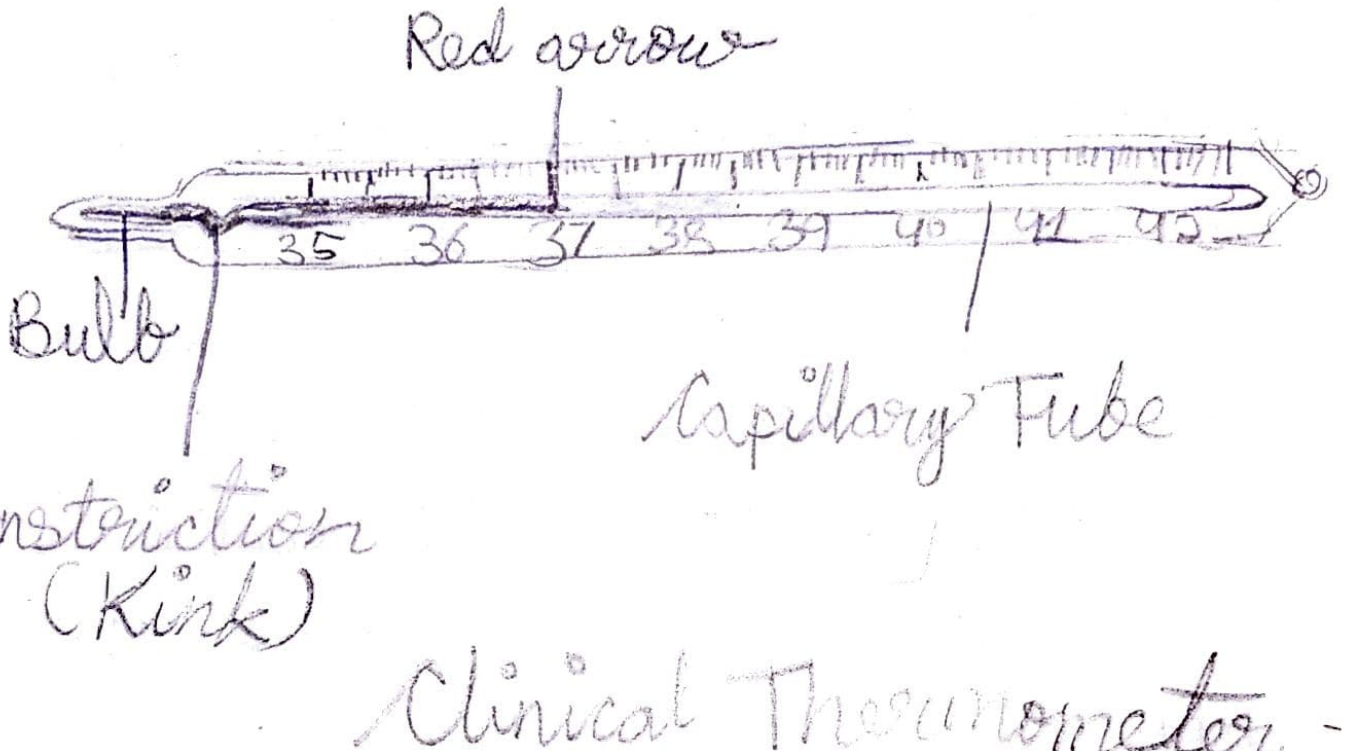
17. Temperature measures the degree of coldness and hotness of a body.

18. The S.I. unit of temperature is kelvin (symbol K).

Common unit of temperature is degree centigrade (symbol °C).

Book exercise

19. For measuring the temperature of a person, a clinical thermometer is used.




Clinical Thermometer -

#20. The temperature of
1. Melting ice = 0°C
2. Boiling water = 100°C

21. Doctors use a special thermometer called the clinical thermometer for measuring the temperature of a patient's body. A clinical thermometer has markings from 35°C to 42°C. It has a slight bend or kink in the stem just above the bulb. This kink is called constriction. This constriction prevents the mercury from falling back all by itself. The temperature of a healthy person is 37°C. This temperature is marked by a red arrow.

17. Temperature measures the degree of coldness and hotness of a body.

18. The S.I. unit of temperature is kelvin (symbol K).
Common unit of temperature is degree centigrade (symbol °C).

20. The temperature of
1. Melting ice = 0°C
2. Boiling water = 100°C

22. Normal temperature of a human body is 37°C or 98.6°F.
To measure the temperature of a patient's body, its bulb is kept either below the tongue or under the arm's pit of the patient for about a minute. Then the thermometer is taken out and its reading is noted. When the temperature of patient's body is above 37°C, he/she is said to suffer with fever.

23. No, a clinical thermometer cannot be used to measure the temperature of boiling water.
The reasons are:
1. It has a very small range.
2. It can break on cooling and on excess heating.

24. The total surface occupied by an object is called its area or, surface area.

25. The S.I. unit of area is square metre or metre$^2$ which in short form is written as $m^2$.

26. (i) Square yard : One square yard is the area of a square of each side 0.836 metre.

1 square yard = 1 yard × 1 yard
= 0.9144m × 0.9144m
= 0.836 $m^2$ (or 0.84 $m^2$ nearly)

(ii) Hectare : One hectare is the area of a square of each side 100 metre. Thus,

1 hectare = 100 metre × 100 metre
= 10000 metre$^2$ (or $10^4$ $m^2$)

(iii) $km^2$ : One square kilometre is the area of a square of each side 1 kilometre. Thus,

1 $km^2$ = 1 km × 1 km = 1000m × 1000m
= $10^6$ $m^2$

(iv) $cm^2 = 1\ cm^2 = \left(\frac{1}{100}\ m\right) \times \left(\frac{1}{100}\ m\right)$
$= \frac{1}{10000}\ m^2 = 10^{-4}\ m^2$

(v) ~~mm²~~ $= mm^2$; $1\ mm^2 = 10^{-6}\ m^2$

27. The area of a square can be calculated by using the following formula -

Area of square of side $l$
= side × side
$= l \times l = L^2$.

The area of a leaf is obtained by using a graph paper. A graph paper has small squared squares of each side 1 mm. The area of each big square is $1\ cm^2$.

Procedure: Place the leaf on graph paper. Draw its outline on the paper and remove it. Now count the number of complete squares. To this add the number of incomplete squares which are half or more than half. Ignore the squares which are less than half.

Thus,
Approximate area = (No. of complete squares + no. of half or more than half