

B) 1) What is measurement? How is a measurement expressed?

Ans → Measurement is a comparison of an unknown quantity with a known fixed 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.

20
Thursday

2) State two characteristics of a unit.

Ans → ~~The~~ Two characteristics of a unit are:

1) It should be a convenient size.

2) It must be universally accepted, i.e. its value must remain same at all places and at all times.

3) Name four basic measurements in our daily life.

Ans → In our daily life we measure the following four basic ~~phys~~ physical quantities.

1) Length

2) Mass

3) Time

4) Temperature

Su
Thursday
22.07.21

4) What are the S.I. units of

1) Mass

2) Time

3) Length

4) Temperature. Write their names and symbols.

Ans → S.I. units are as follows:

<u>Quantity</u>	<u>S.I. units</u>	<u>Symbols of S.I. units</u>
i) Length	metre	m
ii) Mass	kilogram	kg
iii) Time	second	s
iv) Temperature	Kelvin	K

5) Define one metre, the S.I. unit of length. State its one multiple and submultiple.

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

Multiple of metre = kilometre

CW
Thursday

Submultiple of metre = centimetre

Convert the following quantities as indicated

a) 12 inch = ft

b) 1 ft = cm

c) 20 cm = m

d) 4.2 m = cm

e) 0.2 km = m

f) 0.2 cm = mm

g) 2 yard = m

Ans → a) 12 inch = 1 ft

b) 1 ft = 30.48 cm

c) 100 cm = 1 m

∴ 1 cm = $\frac{1}{100}$ m

Sec
Thursday
22.07.21

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

$$\therefore 20 \text{ cm} = 0.2 \text{ m}$$

$$d) 1 \text{ m} = 100 \text{ cm}$$

$$\therefore 4.2 \text{ m} = 100 \times 4.2 \text{ cm}$$

$$= 100 \times \frac{42}{10} \text{ cm} = 420 \text{ cm}$$

$$\therefore 4.2 \text{ m} = 420 \text{ cm}$$

$$e) 1 \text{ km} = 1000 \text{ m}$$

$$\therefore 0.2 \text{ km} = 1000 \times 0.2 \text{ m}$$

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

$$\therefore 0.2 \text{ km} = 200 \text{ m}$$

$$f) 1 \text{ cm} = 10 \text{ mm}$$

$$\therefore 0.2 \text{ cm} = 10 \times 0.2 \text{ mm}$$

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

$$\therefore 0.2 \text{ cm} = 2 \text{ mm}$$

$$g) 1 \text{ yard} = 0.91 \text{ m}$$

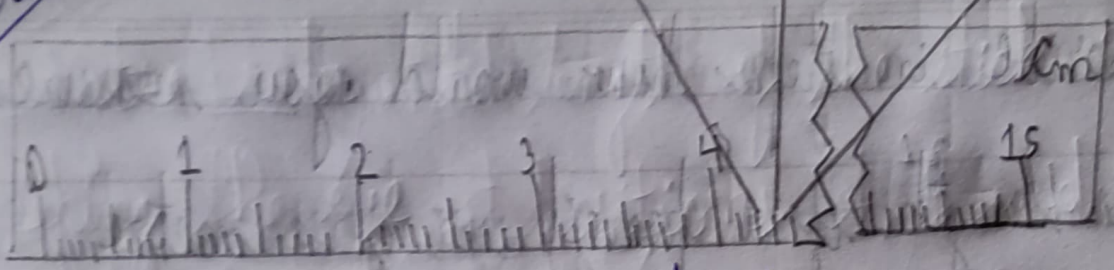
CW
Thursday

Q) a) Describe in steps how would you measure the length of a pencil using a metre ruler. Draw a diagram if necessary.

Ans → To measure the length of a pencil using a metre ruler, place metre ruler with its marking close to the object. Let PA be a pencil. The end P of the pencil coincides with the zero mark on the ruler. The end A of the pencil is ready by keeping the eye at the position 'B' vertically above the end A. so the length of the pencil measured by that ruler is 4.3 centimetre. Diagram of the following =

Q. No
 Thursday
 22.07.21

Wrong position (4.2 cm) Correct position (4.3 cm) Wrong position (4.4 cm)

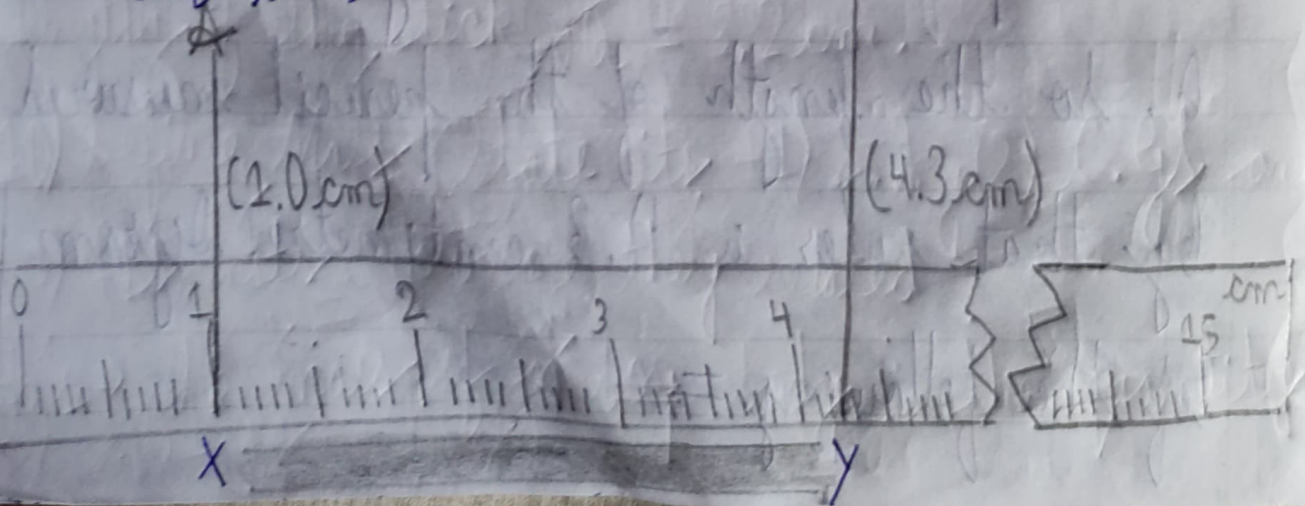


Measuring the length of a

rod OA with a metre ruler

Q) Explain with an example how you will use the metre ruler in part (a) if the ends of ruler are broken?

Ans → The ends of the ruler get damaged with use and its zero mark may not be visible. To measure the length of an object with such a ruler, the object is placed close to a specific markings on the ruler and positions of both ends of the object are read on the ruler.



Cuo
Thursday

The difference of the two reading gives the length of the object. In fig, the reading on ruler at the end X is 1.0cm and at the other end Y is 4.3cm. So the length of the rod XY is $4.3\text{cm} - 1.0\text{cm} = 3.3\text{cm}$.

8) Name the device which you will use to measure the perimeter of your playground.

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

9) The diagram below shows a stick placed along

cu
Thursday
22.07.21

a metre ruler. The length of the stick is measured keeping the eye at positions A, B and C.

Ans → a) Write the length of stick PA as observed.

For each position of the eye, are they all same?

Ans → length of stick PA from

Position A = 3.4 cm

Position B = 3.2 cm

Position C = 3.00 cm

No they are not same.

b) Which is the correct position of the eye?

Write the correct length of the stick.

Ans → 'B' is the correct position of the eye. Correct

length of the stick PA = 3.2 cm.

10) Define Mass. State its (1) S.I., (2) C.GS and (3) FCS units. How are they related?

Ans → The mass of a ~~box~~ body is the quantity

Q.10
Thursday

Date 22.7.25
Page 30

of matter obtained 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) $2500 \text{ kg} = 2.5 \text{ metric tonne.}$

$$1 \text{ kg} = \frac{1}{1000} \text{ metric tonne.}$$

$$\therefore 2500 \text{ kg} = \frac{1}{1000} \times 2500 \text{ metric tonne}$$

$$\therefore 2500 \text{ kg} = 2.5 \text{ metric tonne.}$$

b) $150 \text{ kg} = 1.5 \text{ quintal}$

$$100 \text{ kg} = 1 \text{ quintal}$$

Civ
Thursday
22.07.2021

$$1 \text{ kg} = \frac{1}{100} \text{ quintal}$$

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

$$= 1.5 \text{ quintal}$$

$$\therefore 150 \text{ kg} = 1.5 \text{ quintal}$$

$$c) 10 \text{ lb} = 4.5359 \text{ kg}$$

$$1 \text{ lb} = 453.59 \text{ g}$$

$$= 453.59 \times \frac{1}{1000} \text{ kg}$$

$$= 0.45359 \text{ kg}$$

$$\therefore 10 \text{ lb} = 0.45359 \text{ kg}$$

$$d) 2500 \text{ g} = 2.5 \text{ kg}$$

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

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

$$\therefore 2500 \text{ g} = 2.5 \text{ kg}$$

$$e) 0.01 \text{ kg} = 10 \text{ g}$$

Cu
Thursday

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

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

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

$$\therefore 0.01 \text{ kg} = 10 \text{ g}$$

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

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

$$\frac{5}{1000} \text{ g} \text{ or } 5 \times 10^{-3} \text{ g} = \frac{5}{1000 \times 1000} \text{ or } 5 \times 10^{-6} \text{ kg}$$

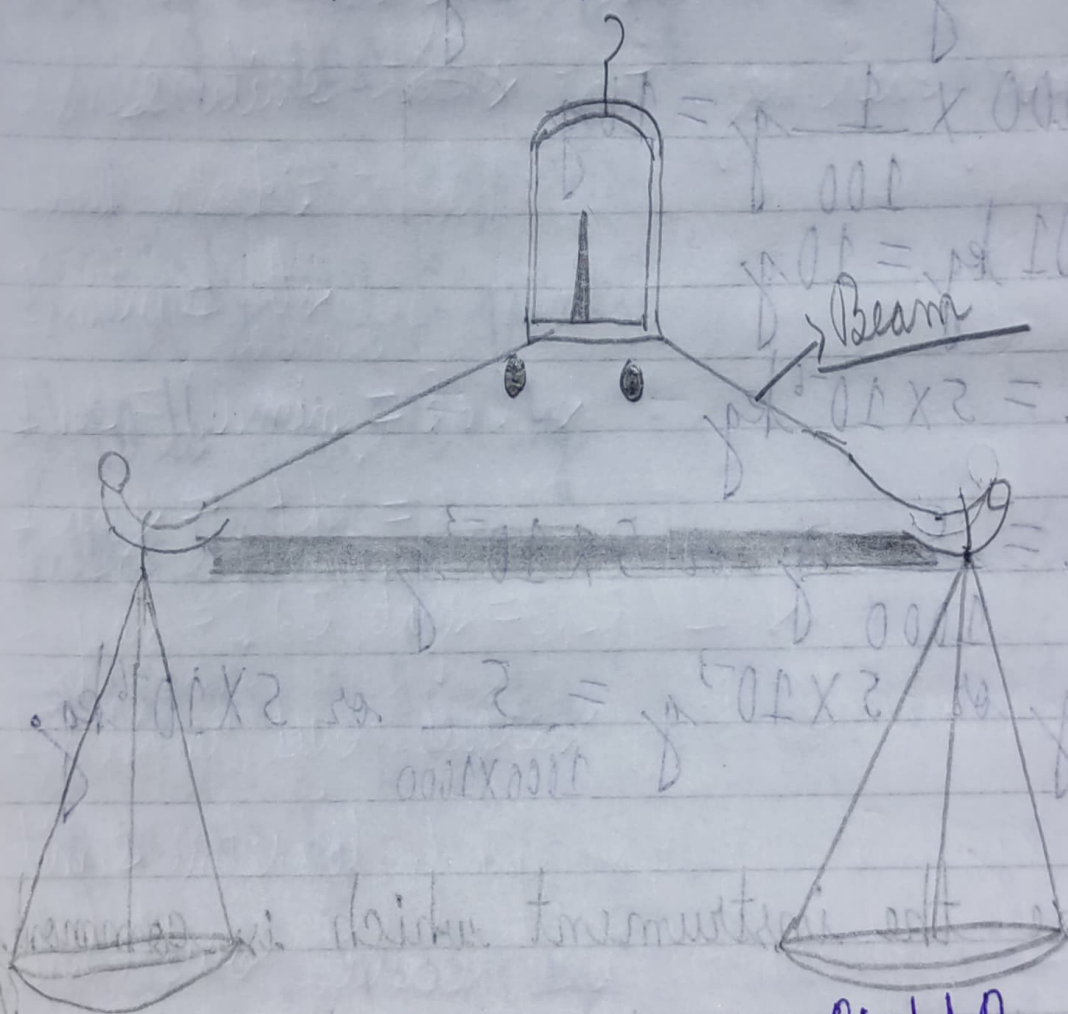
12) Name the instrument which is commonly used to measure the mass of a body or an object. Also state that how it is used?

Ans -> Instrument used to measure the mass of a

Sw
Thursday
22.07.21

body, is the beam balance.

Support to hold the balance



Left Pan

Right Pan

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 weights are put on the right pan. They are so adjusted that the

CW
Thursday

beam is again horizontal on holding the balance up. The total of the standard weights gives the mass of the given body.

13) Define one kilogram, the S.I. unit of mass. How is it related to quintal, metric tonne, gram.

Ans → The mass of 1 litre of water at 4°C is taken as 1 kilogram.

$$1 \text{ quintal} = 100 \text{ kg}$$

$$1 \text{ metric tonne} = 10 \text{ quintal} = 1000 \text{ kg}$$

14) Name and define the S.I. unit of time. How is it related to minute, hour, day and year?

Ans → The S.I. unit of time is second. In short

LW
Thursday
22.7.21

form we write it as 's'.

One second is the time interval between two consecutive ticks that you hear from pendulum wall clock.

$$1 \text{ min} = 60 \text{ s}$$

$$1 \text{ hr} = 60 \text{ min} = 3600 \text{ s}$$

$$1 \text{ day} = 24 \text{ hr} = 86400 \text{ s}$$

$$1 \text{ year} = 365 \text{ days} = 3.15 \times 10^7 \text{ s}.$$

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

Ans → Two devices used to measure the short time interval of an event are:

1) Stopwatch

2) Stopclock

16) Express in second:

1) 3 minute 15 second

2) 5 hour 2 minute 5 second

Thu
Thursday

Date 21.11

Page 33

$$1) \quad 3 \text{ minute} \neq 15 \text{ second}$$

$$1 \text{ minute} = 60 \text{ second}$$

$$3 \text{ minute } 15 \text{ second} = 60 \times 3 + 15$$

$$= 180 + 15$$

$$= 195 \text{ seconds}$$

$$2) \quad 1 \text{ minute} = 60 \text{ second}$$

$$2 \text{ minutes} = 2 \times 60 = 120 \text{ seconds}$$

$$1 \text{ hour} = 3600 \text{ seconds}$$

$$5 \text{ hour} = 3600 \times 5 = 18000 \text{ second}$$

$$5 \text{ hour } 2 \text{ minutes and } 5 \text{ seconds}$$

$$= 18000 + 120 + 5$$

$$= 18125 \text{ seconds}$$

17) What does the temperature measure?

Qw
Thursday
22.1.21

Ans → Temperature measures the degree of coldness and hotness of a body.

18) Name the

1) S.I. unit and

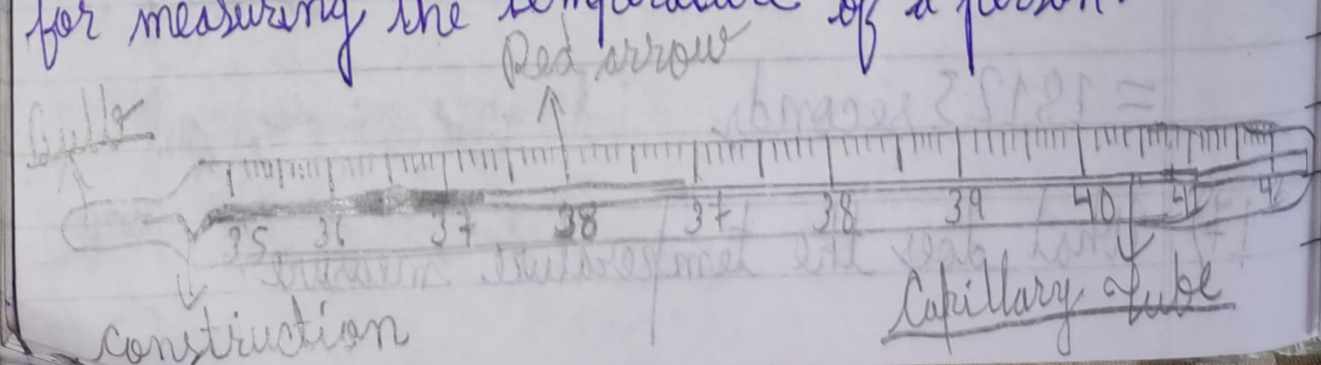
2) one common unit of temperature. Write their symbols also.

Ans → The S.I. unit of temperature is Kelvin (K).

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

19) Name the instrument used for measuring temperature of a person. Draw its neat labelled diagram.

Ans → Clinical thermometer is that instrument used for measuring the temperature of a person.



Ans
Thursday

20) Write the temperature of

1) melting ice = ~~0°C~~

2) Boiling ice = ~~100°C~~

Ans → the temperature of

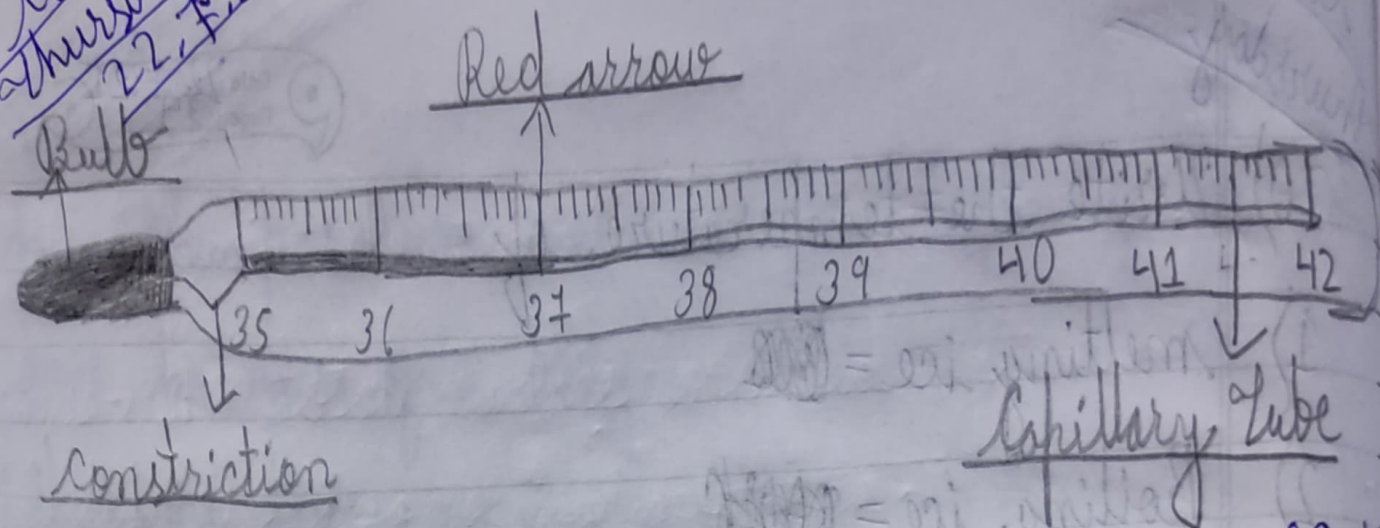
1) Boiling water = 100°C

2) Melting ice = 0°C

21) What is a clinical thermometer? State its special feature. Draw a labelled neat diagram of a clinical thermometer showing the range of temperature marked on it.

Ans → Doctors use a special thermometer called the clinical thermometer for measuring the temperature of the patient's body.

CW
Thursday
22.7.22



This thermometer has the 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 the 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.

22) What is the normal temperature of the human body? How is it indicated in a clinical thermometer?

Ans \rightarrow 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's body for

CW
Thursday

Date 27.7.21
Page 35

about a minute. Then the thermometer is taken out and its reading is noticed. When the temperature of patient's body is above 37°C , he is said to be suffer from fever.

23) Can a clinical thermometer be used to measure the temperature of the boiling water? Give reason for your answer.

Ans) No, a clinical thermometer cannot be used to measured the temperature of boiling water. The reasons are:

- 1) It has a very small range.
- 2) It can break on ~~old~~ cooling and on excess heating.

Su
Thursday
22.7.21

24) Explain the term 'area of a surface'.

Ans → The total surface occupied by an object is called its area or surface area.

25) Name the S.I. unit of area and define it.

Ans → The S.I. unit of area is square metre or meter², which in short form is written as m².

26) How are the units

1) square yard

2) hectare

3) km²

4) cm²

5) mm² related to the S.I. unit of area?

Ans → 1) square yard: One square yard is the area of a square of each side 0.9144 metre.

1 square yard = (1 × 1) yard

= 0.9144 m × 0.9144 m

~~Cw~~
~~Thursday~~

$$= 0.836 \text{ m}^2 \text{ (or } 84 \text{ m}^2 \text{ nearly)}$$

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

$$1 \text{ hectare} = 100 \text{ metre} \times 100 \text{ metre}$$

$$= 10000 \text{ metre}^2 \text{ (or } 10^4 \text{ m}^2)$$

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

$$1 \text{ km}^2 = 1 \text{ km} \times 1 \text{ km} = 1000 \text{ m} \times 1000 \text{ m}$$

$$= 10^6 \text{ m}^2.$$

$$4) \text{ cm}^2: 1 \text{ cm}^2 = \left(\frac{1 \text{ m}}{100} \right) \times \left(\frac{1 \text{ m}}{100} \right) =$$

$$\frac{1}{10000} \text{ m}^2 = 10^{-4} \text{ m}^2.$$

$$10000$$

$$5) \text{ mm}^2: 1 \text{ mm}^2 = 10^{-6} \text{ m}^2.$$

Civ
Thursday
22.7.21

27) Explain how will you measure the area of
a) a square, b) a leaf?

Ans → The area of a square can be calculated by using the following formula:—

Area of square of side l

= side \times side

= $l \times l = l^2$

The area of a leaf is obtained by using a graph paper. A graph paper has small 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,

CW
Thursday

Approximate area = (No. of complete squares + no. of half or more than half of incomplete squares) \times area of one square.

A) Objective type questions.

1) Write True or False.

a) S.I. unit of temperature is Fahrenheit. False

b) Every measurement involves two things - a number and a unit. True

c) Mass is the measure of quantity of matter. True

d) The S.I. unit of time is hour. False

e) The area can be expressed as the product of length of two sides. True

CW
Thursday
22.7.20

2) Fill in the blanks:

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

b) $^{\circ}\text{C}$ 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.

3) Match the following columns, A column with B column.

CW
Thursday

Date 22.7.21
Page 38

Column A

Column B

a) Length of a housing plot

i) Clock

b) Breadth of a book

ii) Beam Balance

c) Mass of an apple

iii) Thermometer

d) Period of time for study

iv) Measuring tape

e) Temperature of a body

v) Graph paper

f) Surface area of a leaf

vi) Metre Ruler

4) Select the correct alternative:

a) Symbol of degree celsius is:

i) $^{\circ}\text{C}$

b) 10mm is equal to:

i) 1cm

c) The amount of surface occupied by an object

Luc
Thursday
22.07.21

is called its:

ukla

d) A metre Ruler is graduated in:

iii) mm

e) A thermometer is graduated in:

ii) $^{\circ}\text{C}$

Luc