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Test Yourself

A) Objective Questions.

1) 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 ~~two~~ lengths of two sides. True

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 ~~boiling~~ 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)

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

Ans: a-iv, b-vi, c-ii, d-i, e-iii, f-v

4) a) The Symbol of degree celsius is:
ans) i) °C

b) 10mm is equal to
ans) ii) 1 cm

c) The amount of surface occupied by an object is called its
ans) ii) Area

d) A metre ruler is graduated in
ans) ii) mm

e) A thermometer is graduated in

ans (ii) °C

B) Short / Long answer Questions.

1) ans Measurement is a comparison of an unknown quantity with a known fixed quantity of the same kind. Measurement is expressed as: n × u = nu.
n = number u = unit.

2) ans The two characteristics of unit are:
(i) It should be of convenient size and
(ii) It must be universally accepted, i.e. its value must remain same at all places and at all times. It should not change with the change of place or time.

3) ans The four basic measurement in our daily lives are:- Length, Mass, Time and Temperature.

4) ans S.I. unit of
i) Mass :- Kilogram (Symbol - kg)
ii) Length :- Metre (Symbol - m)
~~iii) Time :- Kelvin (Symbol - K)~~
iii) Time :- Second (Symbol - s)
iv) Temperature :- Kelvin (Symbol - K)

Exercise

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

ans) Metre is defined as the distance travelled by light in air in $\frac{1}{299,792,458}$ of a second (or in $\frac{1}{8 \times 10^8}$ of a second).

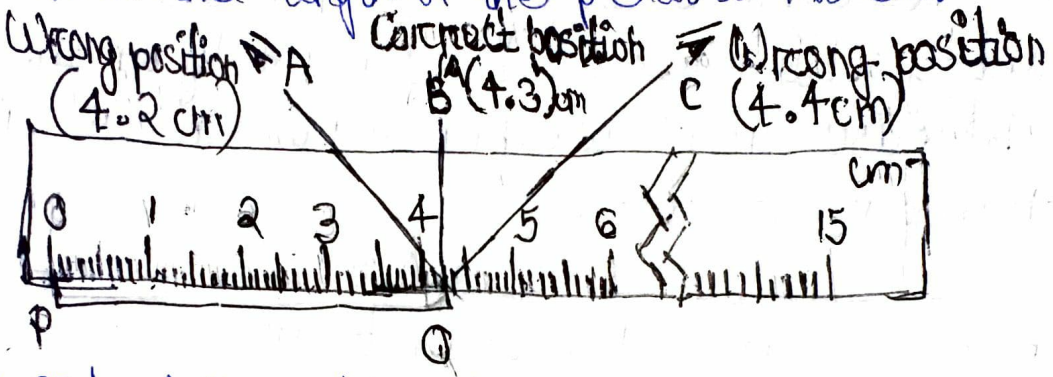
Multiple = 1 km = 1000 m Submultiple = 1 cm = $\frac{1}{100}$ m, 1 mm = $\frac{1}{1000}$ m

6) Convert the following quantities as indicated:

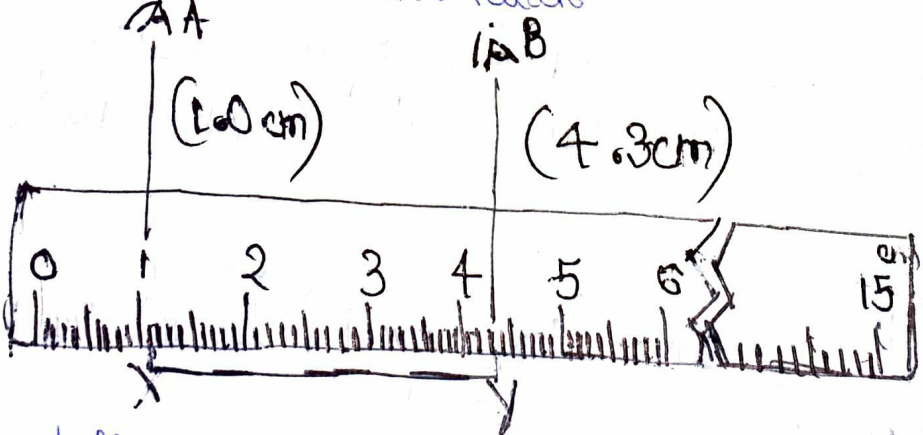
a) 12 inch = ____ ft
b) 1 ft = ____ cm
c) 20 cm = ____ m
d) 4.2 m = ____ cm
e) 0.2 km = ____ m
f) 0.2 cm = ____ mm
g) 1 yard = ____ m

ans) a) 1 ft
b) 30.48 cm
c) 0.2 m
d) 420 cm
e) 200 m
f) 2 mm
g) 0.91 m

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



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



The difference between the pole readings gives the length of the object. In fig. the reading on the ruler at the end X is 1.0 cm and at the end, Y is 4.3 cm. So the length of the rod XY is $4.3 - 1.0 = 3.3$ cm.

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

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

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

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

11)a) 2500 kg = 2.5 metrine tonne
b) 150 kg = 1.5 quintal
c) 10 lb = 4.5359 kg
d) 2520g = 2.5 kg
e) 0.01 kg = 10 g
f) 5 mg = 5×10^{-6} kg

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

When we hold up the balance, we observe that 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 is 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) ans) The mass of 1 litre of water at 4°C is taken as 1 Kilogram

i) 1 quintal = 100 kg

ii) 1 metric ton = 10 ~~quintal~~ quintal = 1000 kg

iii) 1 gram = $\frac{1}{1000}$ kg

14) ans) The S.I. unit of time is second. In the short form, we write it as 's'. One second is the time interval between the two consecutive ticks that we hear from the pendulum wall clock.

i) 1 min = 60 sec

ii) 1 hr = 60 min = 3600 s

iii) 1 day = 24 hr = 86400 s

iv) 1 year = 365 days = 3.15×10^7 s

15) ans) Two devices used to measure the time interval of an event are :- i) Stop watch ii) Stop clock

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16) i) 3 minute 15 second
1 minute = 60 second
3 min 15 sec = 60 X 3 + 15
= 180 + 15
= 195 seconds

ii) 1 min = 60 sec
2 min = 2 X 60 = 120 sec
1 hour = 3600 sec
5 hour = 3600 X 5 = 18000
5 hr 2 min and 5 sec
= 18000 + 120 + 5 = 18125 seconds

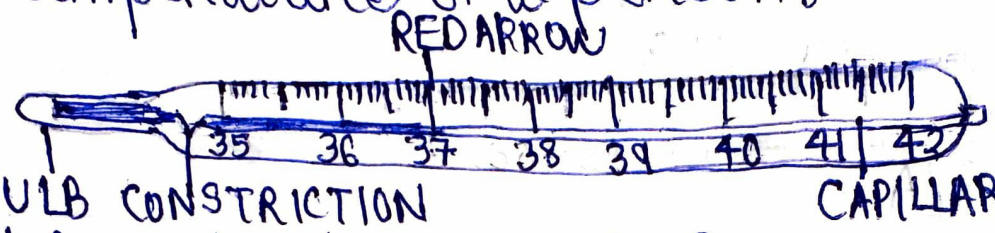
17) ans) Temperature measures the degree of coldness and hotness of a body.

18) ans) i) The S.I. unit of temperature is Kelvin.
(symbol K)

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

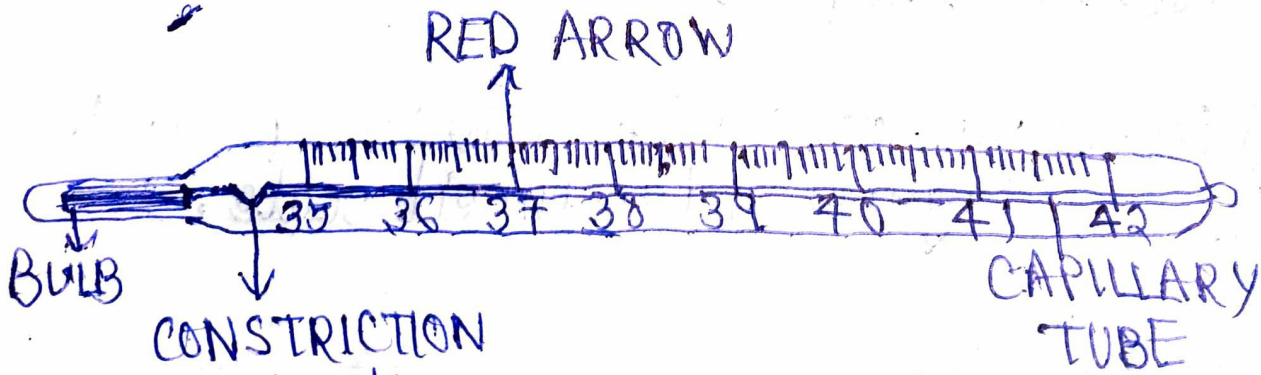
19) Name the instrument used for measuring the temperature of a person. Draw it's neat labelled digram.

ans) A Clinical thermometer is used for measuring the temperature of a person.



20) What is a clinical thermometer? State its special features. Draw a neat labelled digram 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 patients body. 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.



Clinical Thermometer

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Exercise Q no. 19 to 21

20 Q) Write the temperature of (i) melting ice (ii) boiling water

ans) i) Melting ice - 0°C
ii) Boiling water - 100°C

Extra Q/A

Q) Define temperature. Explain the units of temperature.

ans) The temperature is the measure of degree of hotness or coldness of an object. It's units are:- Kelvin, Degree Celcius and Degree Fahrenheit.

Q) What do you mean by ice point and steam point?

ans) Ice point - The freezing point of water is called Ice point.
Steam point - The boiling point of water is called Steam point.

Q) One degree of Celcius scale is equal to _____ degree on Fahrenheit scale.

ans) 9/5 (or 1.8)

22) ans) Normal temperature of a human body is 37°C or 98.6°F. To measure the temperature of a patient's body, it's 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 a patient's body is above 37°C, he is said to suffer from fever.

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

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

25) ans) The S.I. unit of area is a square metre or metre^2 which in short form is written as m^2. One square metre is the area of a square of each side one metre.

26) i) One square yard is the area of a square of each side 0.836 metre.
1 square yard = 1 yard × 1 yard
= 0.9144 m × 0.9144 m
= 0.836 (or 0.84 m^2 nearly)

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ii) One hectare is the area of a square of each side 100 metres. Thus, 1 hectare = 100 metre × 100 metre = 10000 metre^2 (or 10^4 m^2)

iii) One square kilometer is the area of the square of each side 1 kilo meter. Thus, 1 km^2 = 1 km × 1 km = 1000 m × 1000 m = 10^6 m^2.

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

v) 1 mm^2 = 10^{-6} m^2

27) i) Area of square of side 1
= side × side = 1 × 1 = 1^2.

ii) The area of a leaf is obtained by using a graph paper. A graph paper has small squares of each side 1mm. The area of each big square is 1 cm^2.
Procedures: Place the leaf on a graph paper. Draw its outline on the paper and remove it. Now count the no. of complete squares. To this add the no. 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 of incomplete squares) × area of one square.