

1. One mark question

Multiple choice questions

1. Which change can occur when you add heat energy to water?

Ans - c) The water can change from a liquid to a gas.

2. What is sublimation?

Ans - c) The process by which a solid changes directly into a gas.

3. Evaporation is when

Ans - b) a substance changes from a liquid to a gas (or vapor) naturally.

4. What are states of matter?

Ans - d) The physical forms in which a substance can exist, includes solid, liquid, gas and plasma.

5. Force changes the

Ans - a) Motion of the body
b) speed of the body
c) Shape of the body

6. Which of the following is responsible for wearing out of the bicycle tyres?

Ans - c) Frictional Force

7. Force of friction depends on

Ans - a) Roughness of surface
b) Smoothness of surface
c) Inclination of surface.

8. A toy car released with the same initial speed will travel farthest on

Ans- b) Polished marble surface

9. Friction is a

Ans- a) contact force

10. Which of the following produces least friction

Ans- b) Rolling friction

Choose the term to fill in the blanks.

11. Force has to be applied to change the direction of a object.

(moving, direction, force)

(moving, direction, force).

12. When an elephant drags a wooden log over the land, the forces that are applied on the log are muscular force, gravitational force and frictional force.

(muscular force, mechanical force, gravitational force, frictional force)

13. A ball was set rolling on a large table. If its motion is to be changed, a force will have to be applied on it.

14. The force of friction always acts against the motion.

15. One or more forces are acting in the following examples. Name them.

a) An object falling from a tall building.

Ans- Gravitational force

- b) An aeroplane flying in sky.
 Ans- Non-Contact forces
- c) Squeezing sugarcane juice with a Squeezer
 Ans- Mechanical force
- d) Winnowing feed grain
 Ans- Muscular force, Gravitational force.

16. Convert the following quantities as indicated

- a) 10 quintal = 1 metric ton
- b) 1 cm = $\frac{1}{100} = 0.01$ metre
- c) 1 mm = 0.001 metre
- d) 1 yard = 3 ft
- e) 1 decimetre = 0.1 meter
- f) 1 decametre = 10 metre
- g) 1 hectometre = 100 metre
- h) 1 gram = 0.001 kg
- i) 1 mg = $\frac{1}{1000000}$ kg
- j) 1 lb = 453.59 g
- k) 1 h = 3600 s
- l) 1 year = 3.15×10^7 s
- m) 1 day = 86400 s
- n) 1 decametre² = 100 m²
- o) 1 hectare = 10000 m²
- p) 1 kilometre square = 10,00,000 m²

i) $1 \text{ dm}^2 = \underline{100} \text{ cm}^2$

ii) $1 \text{ cm}^2 = \underline{10^{-4}} \text{ m}^2$

iii) $1 \text{ mm}^2 = \underline{10^{-6}} \text{ m}^2$

t) $1 \text{ square yard} = \underline{0.836} \text{ m}^2$

u) $1 \text{ square ft} = \underline{0.09290} \text{ m}^2$

v) $1 \text{ acre} = \underline{4046.856} \text{ m}^2$

2 mark question

1) What are the effects of friction?

Ans- The effects of friction are

1. Friction opposes motion

2. Friction always acts in a direction opposite to the direction of motion

3. Friction produces heat

4. Friction causes wear and tear

2. What are the factors affect the force of friction and how?

Ans- The factors affecting the force of friction are -

i) The Smoothness of the surface :- The force of friction is more between rough surfaces and less between smooth surfaces. There will be no friction between two perfectly smooth surfaces.

ii) The nature of medium (solid, liquid, gas) in which the body moves :- Solid, liquid or gas, all exert the force of friction on a moving body. The force of friction between a solid and another solid is more, it is less

between a solid and liquid and still less between a solid and gas.

ii) ~~The weight of the moving body on the surface:~~

Greater the weight of the moving body on a surface, more the force of friction on the body by the surface.

19. Define static friction, sliding friction & rolling friction

Ans- i) Static friction :- The force of friction acting on the object is called the static friction.

A parked car is an example of static friction

ii) Sliding friction :- When the body begins to slide on a surface, the force exerted by the surface on the object is called the sliding friction.

For example :- Rubbing both the hands together to create heat.

iii) Rolling Friction :- When an object rolls over a surface, the force which opposes the rolling motion of the object is called the rolling friction.

For example :- Ball bearings are used between the hubs and axles of a ceiling fan and a bicycle.

20. What are the disadvantages of friction?

Ans- The disadvantages of friction are -

i) Friction opposes the motion of a body it decreases the efficiency.

ii) Friction causes wear and tear in the moving parts.

iii) Friction produces heat.

21. Why does a matchstick catch fire when rubbed on the rough surface of the box?

Ans- On rubbing the matchstick in the rough surface, the friction converts this work into heat. The heat raises the temperature of the chemical present on the match stick head to its ignition temperature. Due to this the chemical substance catches fire and the matchstick starts burning.

22. The sole of shoes get worn after some time. Explain why?

Ans- The soles of our shoes get worn out after a period of time due to the effect of friction. The soles of shoes increase the friction because it makes the surface of the shoes rough. When we walk on the road then the friction arises.

23. Convert the following quantities as indicated.

a) $12 \text{ inch} = 1 \text{ ft}$

b) $1 \text{ ft} = 30.48 \text{ cm}$

c) $20 \text{ cm} = 0.2 \text{ m}$

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

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

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

$$d) 4.2 \text{ m} = \underline{420} \text{ cm}$$

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

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

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

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

$$e) 0.2 \text{ km} = \underline{200} \text{ m}$$

$$= \cancel{0.2} \text{ km} = 1000 \text{ m}$$

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

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

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

$$f) 0.2 \text{ cm} = \underline{2} \text{ mm}$$

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

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

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

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

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

3 mark Questions

24. Define -

- Applied force - An applied force is a force that is applied to an object by a person or another object.
- Tension - Two pulling forces, directly opposing each other, that stretch an object and try to pull it apart is called force of tension.
- Frictional Force - Friction is the force that opposes the relative motion between the two surfaces in contact with each other.

25. Compare properties of solid, liquid and gases. (any 3 points).

Ans

Properties	Solid	Liquid	Gas
i) Shape	Definite	Acquires the shape of container.	Acquires the shape of container.
ii) Volume	Definite	Definite	Indefinite
iii) Compressibility	Not compressible	Negligibly compressible	Highly compressible

26. Most substances can from one state to another under different conditions of temperature and pressure. Explain with examples.

Ans- Most substances can change from one state to another under different conditions of temperature and pressure. Physical conditions like temperature & pressure affect the states of matter. Both temperature and pressure can be measured, & state changes can be observed. When thermal energy is added to a substance, its temperature increases, which can change its state from solid to liquid (melting), liquid to gas (vaporization), or solid to gas (sublimation). Decreasing pressure can cause it to vaporize.

27. Why?

a) Machines are oiled from time to time.

Ans- A machine is oiled from time to time to reduce friction between its body parts. By doing so, the life span of a machine increases.

b) A object ~~comes down because of gravity~~. Thrown upwards comes down after reaching a point.

Ans- The object comes down because of the gravitational force. Because after a certain point, the object observes a pressure of gravity and at that point the force of the gravity at the point is high.

c) Powder is sprinkled on a Carrom board.

Ans- Powder is sprinkled on a Carrom board to reduce friction between the striker / Carrom coins and the Carrom board. The powder smoothes the surface of the board and thus the striker and coins can move on it easily.

28. Explain increasing and decreasing friction with suitable examples.

Ans- When we suddenly push brakes of vehicle of high speed, it creates a lot of friction, it means to increase the friction. When we pour oil in the hinges of door to make it free to open and close, it means to decrease in friction.

29. Cartilage is present in joints of our body, which helps in their smooth movement. If cartilage wears off, how would this affect the movement of joints?

Ans- Cartilage is found in our body's joints and helps to minimize friction during joint movement. However, as this cartilage wears away, the power of friction increases reducing the fluidity of movement and causing joint pain.

30. Define mass, state its 1) S.I. 2) C.G.S and 3) F.P.S units. How they are related?

Ans- Mass - The mass of a body is the quantity of matter contained in it.

S.I. unit - The S.I. unit of mass is Kilogram (kg).

C.G.S unit - The C.G.S unit of mass is gram (g)

F.P.S unit - The F.P.S unit of mass is pound (lb).

Relation ship between gram, kilogram and pound-

$$1 \text{ g} = \frac{1}{1000} \text{ kg} = 10^{-3} \text{ kg}$$

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

3). Convert the following quantities as indicated :

a) $200 \text{ kg} = \underline{0.2}$ metric tonne

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

$$= 1 \text{ kg} = \frac{1}{1000} \times 200 \text{ metric tonne}$$

$$= 200 \text{ kg} = \frac{1}{1000} \times 200 \text{ metric tonne} = \frac{1}{5} \text{ metric tonne}$$

$$= 200 \text{ kg} = 0.2 \text{ metric tonne}$$

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

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

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

$$= 150 \text{ kg} = \frac{1}{100} \times 150 \text{ quintal} = \frac{3}{2} \text{ quintal}$$

$$= 1.5 \text{ quintal}$$

$$\begin{aligned}
 c) \quad 10 \text{ lb} &= 4.5359 \text{ Kg} \\
 &= 1 \text{ lb} = 453.59 \text{ g} \\
 &= 453.59 \times \frac{1}{1000} \text{ Kg} \\
 \therefore 10 \text{ lb} &= 0.45359 \text{ Kg}
 \end{aligned}$$

$$\begin{aligned}
 d) \quad 250 \text{ g} &= 0.25 \text{ Kg} \\
 1000 \text{ g} &= 1 \text{ Kg} \\
 = 1 \text{ g} &= \frac{1}{1000} \text{ Kg} \\
 = 250 \text{ g} &= \frac{1}{1000} \times 250 \text{ Kg} = \frac{1}{4} \text{ Kg} \\
 &= 0.25 \text{ Kg} \\
 \therefore 250 \text{ g} &= 0.25 \text{ Kg}
 \end{aligned}$$

$$\begin{aligned}
 e) \quad 0.01 \text{ Kg} &= 10 \text{ g} \\
 1 \text{ Kg} &= 1000 \text{ g} \\
 0.01 \text{ Kg} &= 1000 \times 0.01 \text{ g} \\
 &= 1000^{\cancel{10}} \times \frac{1}{\cancel{100}} \text{ g} \\
 &= 10 \text{ g} \\
 0.01 \text{ Kg} &= 10 \text{ g}
 \end{aligned}$$

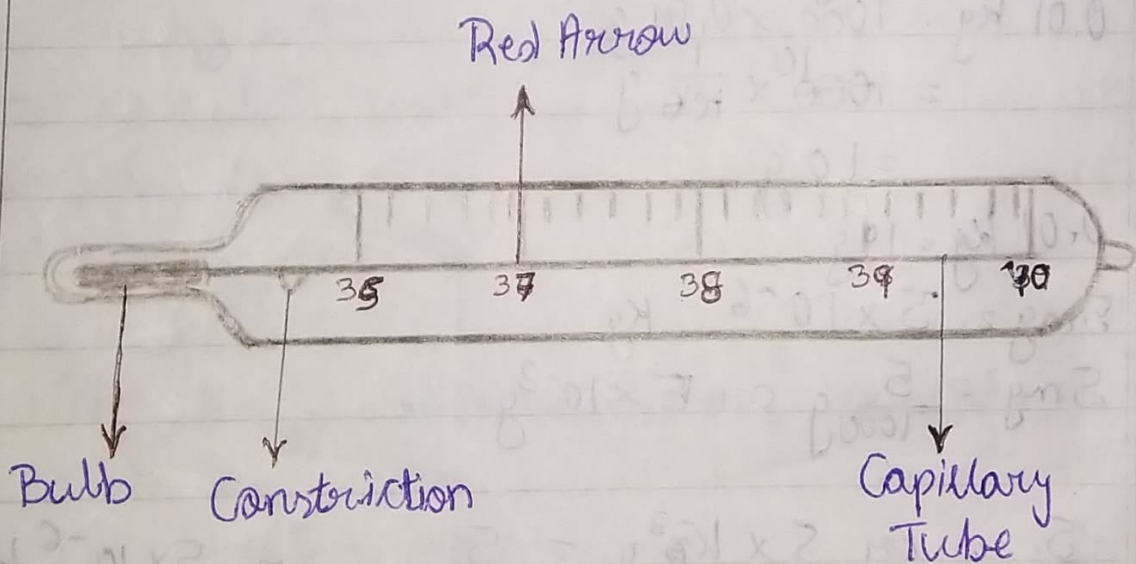
$$\begin{aligned}
 f) \quad 5 \text{ mg} &= 5 \times 10^{-6} \text{ Kg} \\
 5 \text{ mg} &= \frac{5}{1000} \text{ g} \text{ or } 5 \times 10^{-3} \text{ g}
 \end{aligned}$$

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

$$\therefore 5 \text{ mg} = 5 \times 10^{-6} \text{ Kg}$$

32. What is a clinical thermometer? State its special feature. Draw a labeled 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. This 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 the constriction. This construction 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

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

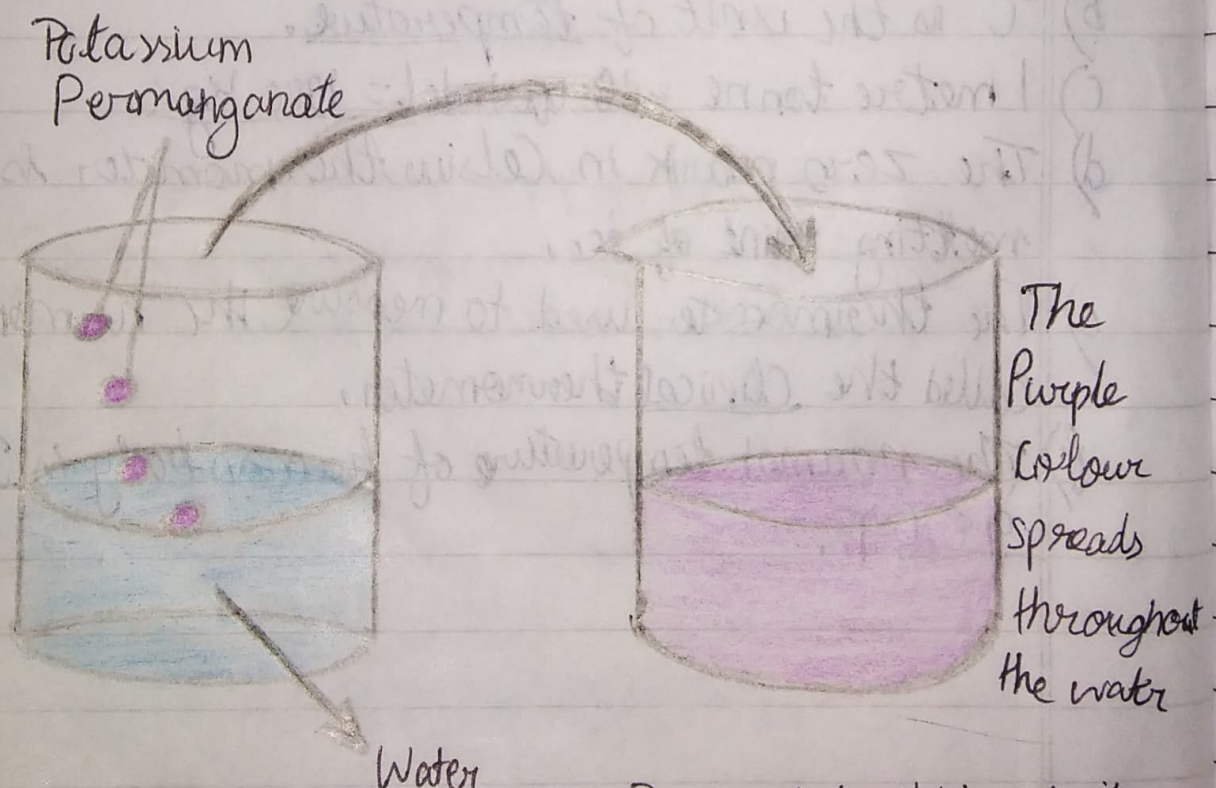
Ans. The normal temperature of a human body is 37°C or 98.6°F . To measure the temperature of a patient's body, its bulb is kept either below the tongue or under the arm's pit of the patient for about a minute. Then the thermometer is taken out and its reading is noted. When the temperature of patient's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

33. Fill in the blanks.

- The S.I unit of length is metre of time is second of mass kilogram.
- $^{\circ}\text{C}$ is the unit of temperature.
- 1 metric tonne = 10 quintal = 1000 kg.
- The zero mark in Celsius thermometer is the melting point of ice.
- The thermometer used to measure the human body is called the clinical thermometer.
- The normal temperature of human body is 37°C or 98.6°F .

34. When crystal of potassium permanganate is placed in a beaker, purple colour spreads through out the water. What does this observation tell us about the nature of Potassium permanganate and water? Explain with an activity?

Ans- ~~All matter is made up of~~ Take 100 ml of water in a beaker and dissolve 2-3 crystals of potassium permanganate in the water. We will get a deep purple coloured solution. This is due to diffusion. The observation of purple colour spreads throughout the water is that the crystal of potassium permanganate is made up of many small particles and these particles potassium permanganate occupy the spaces between ~~the~~ the water.



This experiment shows that when potassium permanganate is added to water its purple colour spreads throughout the water.