Date: _____ Page: _____

LORD BUDDHA NATIONAL PUBLIC SCHOOL
JAUNPUR
CLASS-VII SUBJECT- SCIENCE

CHAPTER — HEAT

Concept of Hot and Cold

~~Hot~~ → The measure of degree of hotness or coldness of a substance is called its temperature.

Thermometer: The device that is used to measure the temperature of a substance is called thermometer.

Measurment of Temperature.

⇒ Thermometers are of two types —

(i) Clinical Thermometer: Used for measuring temperature of human body.

(ii) Laboratory Thermometer: Used for measuring temperature of common objects.

Date: Page:

NOTE: The temperature range of clinical thermometer is 35°C to 42°C and that of laboratory thermo-meter is −10°C to 110°C. The unit for temper-ature is °C.

Other Units for temperature :

(i) Kelvin (K) It is the base unit of temperature in the SI system (International System of Units)

(ii) Celsius (°C) It is a derived unit for temperature in the SI system. Kelvin being the base unit.

(iii) Fahrenheit (°F) It was first introduced by a Dutchman named Gabriel fahrenheit in 1724.

Conversion of Units of Temperature

① From Celcius scale to fahrenheit scale

$$[^\circ F] = [^\circ C] \times \frac{9}{5} + 32$$

E.g. If a body has a temperature of 30°C its temperature on fahrenheit scale can be calcu-lated as −

its temperature on Kelvin scale can be calculated as –

$$[K] = 37.5 + 273.15$$
$$= 310.65$$

∴ The temperature of body is 310.65 K.

④ from Kelvin scale to Celcius scale

$$[°C] = [K] - 273.15$$

E.g.→ If a body has a temperature of 210 K then its temperature in Celcius scale can be calculated as-

$$[°C] = 210 - 273.15$$
$$[°C] = -63.15$$

∴ The temperature of body is −63.15 °C

⑤ from Kelvin scale to fahrenheit scale

for this, you first need to convert the tempera-ture from Kelvin scale to Celcius scale and then to fahrenheit scale.

⑥ from fahrenheit scale to Kelvin scale

for this, you first need to convert the temperature

from fahrenheit scale to celcius scale and then to kelvin scale.

Precaution for clinical thermometer

→ Do not use a clinical thermometer for measuring the temperature of any object other than the human body.

→ Also avoid keeping the thermometer in the sun or near a flame. It may break.

Precaution for Laboratory thermometer

→ The laboratory thermometer should be kept upright not tilted.

→ Bulb should be surrounded from all sides by the substance of which the temperature is to be measured.

→ The bulb should not touch the surface of the container.

NOTE

* The normal temperature of human body is 37°C
* Celsius and fahrenheit scales are two most commonly used scales.

Date: Page:

$$[°F] = \frac{\cancel{30}^{6} \times 9}{\cancel{5}} + 32$$

$$[°F] = 54 + 32$$

$$[°F] = 86$$

∴ The temperature of body is 86°F.

(2) from fahrenheit scale to Celcius scale

$$[°C] = ([°F] - 32) \times \frac{5}{9}$$

E.g. If a body has a temperature of 68°F, its temperature on celcius scale can be calculated as -

$$[°C] = (68 - 32) \times \frac{5}{9}$$

$$[°C] = \frac{\cancel{36}^{4} \times 5}{\cancel{9}}$$

$$[°C] = 20$$

∴ The temperature of body is 20°C.

(3) from Celcius scale to ~~fahre~~ Kelvin scale

$$[K] = [°C] + 273.15$$

Eg. If a body has a temperature of 37.5°C

Date: _____ Page: _____

HOME ASSIGNMENT

① Fill in the blanks –

(a) _____ is the base unit of temperature in the SI system.

(b) SI system stands for _____.

(c) Fahrenheit scale was first introduced by _____ in _____.

(d) Degree of hotness or coldness is called _____.

② State True or false –

(a) The bulb of Laboratory thermometer should touch the surface of container. ( )

(b) The normal human body temperature is 37°C. ( )

(c) We can change temperature of a body by simply heating or cooling it. ( )

(d) The boiling point of water is 100°C and freezing point is 0°C. ( )

(e) The temperature range of clinical thermometer is −10°C to 110°C.

③ Answer the following questions in 20-50 words.

(a) Define temperature.

Date: _____ Page: _____

(b) What is the temperature range of clinical and laboratory thermometer?
(c) Convert 36°C into °f.
(d) Convert 310 K into °C
(e) Name the different units of temperature with their symbols.

④ Answer the following in details.

(a) Name the device used to measure temperature. Also mention its type.
(b) Differentiate between a Clinical and a Laboratory thermometers.
(c) Write short note on different units of temperature.
(d) Convert :
(i) 136°C into K
(ii) 0°C into °f
(iii) -40°C into °f
(iv) 113°f into °C
(v) 303 K into °C
(vi) -12°C into K
(vii) 103°f into K
(viii) 346 K into °f
(ix) 30°C into f
(x) 390 K into °f.

(e) What precautions should be taken while using clinical and laboratory thermometer?