7 Temperature and its Measurement

A. Multiple Choice Questions.

1. On the Celsius scale, what is the freezing point of water?
   a. 100°C b. 0°C c. -100°C d. 32°C

2. What is the normal temperature of a healthy human body in Fahrenheit?
   a. 100.4°F b. 98.6°F c. 86.5°F d. 99.0°F

3. What is the boiling point of water on the Fahrenheit scale?
   a. 0°F b. 100°F c. 212°F d. 32°F

4. What does a thermometer use to indicate temperature changes?
   a. Air b. Liquid c. Metal d. Solid

5. Which scale is NOT used to measure temperature?
   a. Celsius b. Kelvin c. Fahrenheit d. Meter

6. What is the boiling point of water on the Celsius scale?
   a. 90°C b. 110°C c. 100°C d. 80°C

7. On which temperature scale is absolute zero the lowest possible temperature?
   a. Fahrenheit b. Celsius c. Kelvin d. Rankine

8. Which type of thermometer can measure very low temperatures?
   a. Clinical thermometer b. Laboratory thermometer
   c. Digital thermometer d. Infrared thermometer

9. A clinical thermometer has a temperature range of:
   a. 0°C to 100° b. 35°C to 42° c. -10°C to 50°C d. 0°C to 50°C

10. The Fahrenheit scale is commonly used in which country?
    a. India b. Germany c. Japan d. United States

11. _____ measures temperature without making contact with the human body?
    a. Infrared thermometer b. Mercury thermometer
    c. Digital thermometer d. Alcohol thermometer

12. How should a laboratory thermometer be held when measuring temperature?
    a. Horizontally b. Vertically c. Upside down d. At a 45-degree angle

13. Digital thermometers measure temperature using which sensors?
    a. Light sensors b. Sound sensors c. Heat sensors d. Pressure sensors

14. What is the normal temperature of a healthy human body in Celsius?
    a. 34.0 °C b. 36.0 °C c. 30.0 °C d. 37.0 °C

B. Fill in the Blanks.

Infrared thermometer	Summer	Laboratory	Digital	Hot
Alcohol, mercury	Batteries	Temperature	-10°C, 110°C	Fever

1. _____ is also measured in Celcius (°C) or Fahrenheit (°F) scales.
2. The temperature difference between the two bodies tells us how _____ one body is in comparison to another.
3. The digital clinical thermometers and run on _____.
4. _____ was used during the COVID-19 pandemic for non-contact measurement.
5. A laboratory thermometer typically has a range from _____ to _____.
6. _____ thermometers are safer to use because they do not contain mercury.
7. _____ thermometers are used in scientific settings.
8. Pulse rate alone is not a reliable indicator of _____.
9. The liquid inside a laboratory thermometer is often _____ or _____.
10. The temperature in _____ is usually higher than in winter.

C. State true or false.

1. The term hot and cold are relative. ☐
2. A hotter body has a higher temperature than a colder body. ☐
3. The Kelvin scale uses the degree symbol (°) to denote temperature. ☐
4. Heat energy is measured in degree centigrade. ☐
5. A clinical thermometer is marked between 95°C to 110°C. ☐
6. Fever affects the pulse rate of a person. ☐
7. A clinical thermometer should be sterilized in boiling water. ☐
8. Digital thermometers are easier to read than mercury thermometers. ☐
9. The Fahrenheit scale is becoming more common in scientific studies. ☐
10. The Fahrenheit scale sets the freezing point of water at 0 °F. ☐

D. Answer the following questions.

1. What is the function of a thermometer?
Ans. _____
_____

2. What is a digital thermometer?
Ans. _____
_____

3. How do non-contact thermometers work, and what are their benefits?
Ans. _____
_____

4. What is the Celsius scale?
Ans. _____
_____

5. What are the two different types of thermometers?
Ans. _____
_____

6. What is absolute zero?
Ans. _____
_____

7. What is the Fahrenheit scale?
Ans. _____
_____

8. What is the role of weather stations in measuring air temperature?
Ans. _____
_____

9. Name the disease caused by severe mercury poisoning.
Ans. _____
_____

10. What precautions should be taken when using a thermometer?
Ans. _____
_____

E. Give reason.

1. Why is it important to measure temperature accurately?
Ans. _____
_____

2. Why is it necessary to wash the tip of the thermometer before and after use?
Ans. _____
_____

3. Why are mercury thermometers being replaced?
Ans. _____
_____

4. Why is a clinical thermometer not used to measure a very high temperature?
Ans. _____
_____

5. Why is a thermometer kept under the tongue to measure the body temperature?
Ans. _____
_____

6. Why is the sense of touch unreliable for measuring temperature?
Ans. _____
_____

F. Answers the following questions in detail.

1. How does a clinical thermometer differ from a laboratory thermometer?
Ans. _____
_____
_____
_____

2. How is temperature affected during phase change like boiling and melting?
Ans. _____
_____
_____
_____

3. What are the benefits of using a digital thermometer over a mercury thermometer?
Ans. _____
_____
_____
_____

4. What is the normal range of human body temperature, and why might it vary?
Ans. _____
_____
_____
_____

5. What are the use of a laboratory thermometer?
Ans. _____
_____
_____
_____

G. Give One-Word Answers.

1. A measure of how hot or cold an object is. :- _____
2. The SI unit of temperature :- _____
3. The instrument used to measure temperature :- _____
4. The silvery grey liquid used in clinical thermometers. :- _____
5. The scale is commonly used for body temperature. :- _____

6. Name the woman who helped India to become one of the global leaders in renewable energy. :- _____

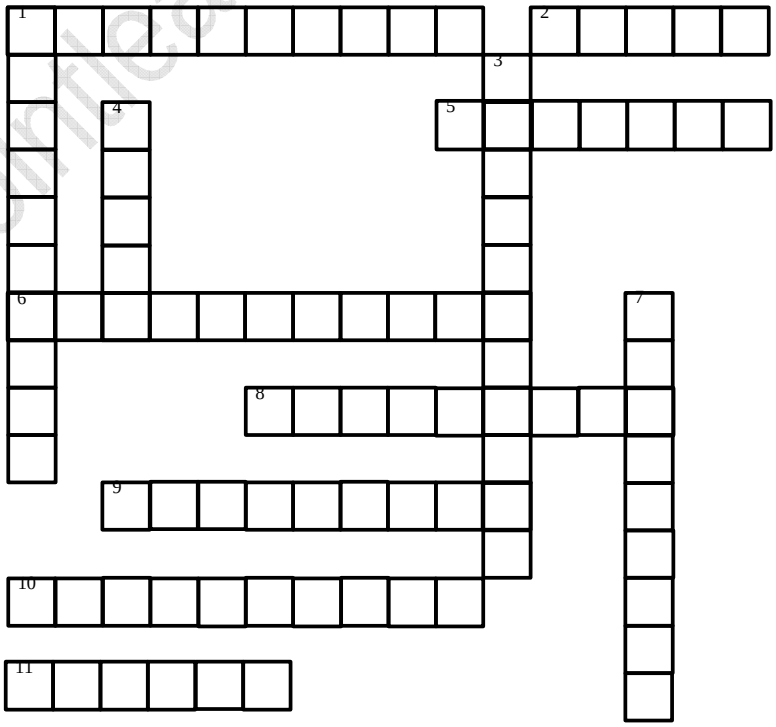
H. Match the Following.

Column A	Column B	Ans.
1. °C, °F, K	i. Weather Woman of India	a. ____
2. Kelvin	ii. Important weather parameter	b. ____
3. Laboratory thermometer	iii. Toxic substance	c. ____
4. Mercury	iv. 273.15	d. ____
5. Anna Mani	v. Digital thermometer	e. ____
6. Air temperature	vi. The symbols of all units	f. ____

I. Solve the puzzle.

Across

1. The transfer of heat by the circulation or movement of heated particles
2. A colour which is a good radiator as well as a good absorber of heat
5. The scale which shows the temperature of boiling water as 100
6. The instrument to measure temperature
8. Fastest mode of heat transfer
9. A material that is a poor conductor of heat
10. The scale which shows the temperature of freezing water as -32
11. SI unit of temperature



Down

1. The transfer of heat energy by vibrating materials in contact with the neighbouring particles
3. A measure of the warmth or coldness of an object or substance
4. A colour which is a poor absorber of heat
7. A material that easily allows heat transfer

Answer

A.

1. 0°C
2. 98.6°F
3. 212°F
4. Liquid
5. Meter
6. 100°C
7. Kelvin
8. Laboratory thermometer
9. 35°C to 42°C
10. United States
11. Infrared thermometer
12. Vertically
13. Heat sensors
14. 37.0 °C

B.

1. Temperature
2. Hot
3. Batteries
4. Infrared thermometer
5. -10°C to 110°C
6. Digital
7. Laboratory
8. Fever
9. Alcohol, mercury
10. Summer

C.

1. True
2. True
3. False
4. False
5. False
6. True
7. True
8. True
9. False
10. False

D.

1. A thermometer is an instrument which is used to measure the temperature of a substance.
2. A digital thermometer is an electronic device that measures temperature using sensors.
3. Non-contact thermometers work by measuring infrared radiation emitted by objects. They have the benefit of not requiring physical contact, making them safer and more convenient.
4. The Celsius scale is a temperature scale where the freezing point of water is 0°C and the boiling point is 100°C.
5. The two different types of thermometers are clinical thermometers and laboratory thermometers.
6. Absolute zero is the lowest possible temperature that can be reached, where all molecular motion stops. It is equivalent to -273.15°C or -459.67°F.
7. The Fahrenheit scale is a temperature scale where the freezing point of water is 32°F and the boiling point is 212°F.
8. Weather stations use thermometers to measure air temperature. They are important for understanding weather patterns and climate.
9. The disease caused by severe mercury poisoning is Minamata disease.
10. Precautions when using a thermometer include washing the tip before and after use, shaking a glass thermometer down before use, and avoiding contact with the bulb of the thermometer.

E.

1. Accurate temperature measurement is important for various reasons, including medical diagnosis, scientific research, industrial processes, and weather forecasting.
2. Washing the tip of a thermometer before and after use helps prevent the spread of germs and ensures accurate readings.
3. Mercury thermometers are being replaced because mercury is a toxic substance that can pose health risks if ingested or inhaled.
4. A clinical thermometer is not used to measure a very high temperature because it is designed for a specific temperature range and may not be accurate at higher temperatures.
5. A thermometer is kept under the tongue to measure body temperature because the mouth is a relatively stable environment and provides a good indication of core body temperature.

6. The sense of touch is unreliable for measuring temperature because it can be influenced by factors such as the temperature of the person's hand and the temperature of the object being touched.

F.

1. A clinical thermometer differs from a laboratory thermometer in several ways. Clinical thermometers are designed for measuring human body temperature and have a limited temperature range of typically 35°C to 42°C. Laboratory thermometers, on the other hand, can measure a wider range of temperatures and are used for scientific experiments and research.
2. Temperature is affected during phase changes like boiling and melting. When a substance boils, its temperature remains constant until all of the substance has vaporized. Similarly, when a substance melts, its temperature remains constant until all of the substance has melted.
3. Digital thermometers have several benefits over mercury thermometers, including being safer (as they do not contain toxic mercury), easier to read, and more accurate. They are also more durable and can be easily cleaned and sterilized.
4. The normal range of human body temperature is typically between 36.1°C (97°F) and 37.8°C (100°F). However, it can vary depending on factors such as time of day, activity level, and individual variations.
5. Laboratory thermometers have a wide range of uses in scientific settings. They can be used to measure the temperature of liquids, gases, and solids in various experiments and research.

G.

1. Temperature
2. Kelvin
3. Thermometer
4. Mercury
5. Fahrenheit
6. Anna Mani

H.

1. vi 2. iv 3. v 4. iii 5. I 6. ii

I.

Across:-

1. convection
2. black
5. Celsius
6. thermometer
8. radiation
9. insulator
10. Fahrenheit
11. Kelvin

Down:-

1. conduction
3. temperature
4. white
7. conductor