THERMOMETRY

1. Temperature can be expressed as a derived quantity in terms of

- 1) Length and mass
- 3) length, mass and time

2. A Celsius is a unit of

- 1) Current
- 3) Temperature

- 2) Heat
- 4) Quantity of matter

2) mass and time

4) none of these

3. Mercury is used in liquid thermometers because it has

- 1) high specific heat and high conductivity
- 2) high specific heat and low conductivity
- 3) low specific heat and low conductivity
- 4) low specific heat and high conductivity

4. Very low temperatures are measured by

1) gas thermometers

3) Thermocouple thermometers

4) vapour pressure thermometers

2) pyrometers

5. The temperature of the sun is measured with

- 1) Platinum thermometer
- 3) Pyrometer

2) gas thermometer

4) vapour pressure thermometer

6. Of the following thermometers the one which is most useful for the measurement of a rapidly varying temperature is a

- 1) platinum resistance thermometer
- 2) gas thermometer
- 3) thermoelectric thermometer
- 4) saturation vapour pressure thermometer
- 7. Standardization of thermometers is obtained with
 - 1) Jolly's thermometer

- 2) platinum resistance thermometer
- 3) thermocouple thermometer
- 4) gas thermometer

www.sakshieducation.com

8. To measure temperature, most accurately one should use

- 1) thermocouple thermometer2) resistance thermometer
- 3) constant volume gas thermometer 4) mercury thermometer

9. A temperature *T* is measured by a constant volume gas thermometer

- 1) *T* is independent of the gas used at all pressures
- 2) *T* is independent of the gas used only at high pressure
- 3) The ideal gas scale agrees with the absolute scale of temperature
- 4) The ideal gas scale does not agree with the absolute scale of temperature

10. A constant volume gas thermometer works on

1) Archimedes' principle2) Pascal's law3) Boyle's law4) Charles' law

11. The value of temperature coefficient of resistance thermometer is

- 1) low and negative 2) low and positive
- 3) high and negative 4) high and positive

12. The temperature of a gas is measured with a

- 1) platinum resistance thermometer
 2) pyrometer
- 3) gas thermometer 4) vapour pressure thermometer

13. For a constant volume gas thermometer, one should fill the gas at

- 1) high temperature and high pressure2) high temperature and low pressure
- 3) low temperature and low pressure
- 4) low temperature and high pressure

14. The resistance R_t of a conductor varies with temperature as shown in fig. If the variation is represented as $R_t = R_0 (1 + \alpha t + \beta t^2)$

- 1) α and β are both negative 2) α is positive and β is negative
- 3) α and β are both positive 4) α is negative and β is positive

15. On which of the following scales of temperature, the temperature is never negative

1) Celsius	2) Fahrenheit	3) Reaumur	4) Kelvin
T,) Celsius	2) 1 ameninen	J) Reaumui	+) Kervin

www.sakshieducation.com



21. A centigrade and a Fahrenheit thermometer are dipped in boiling water. The water temperature is lowered until the Fahrenheit thermometer registers 176⁰F. What is the fall in temperature as registered by the Centigrade Thermometer?

1) 20^{0} C 2) 40^{0} C 3) 60^{0} C 4) 80^{0} C

22. A fixed mass of an ideal gas is maintained at constant volume the pressure of the gas at triple point of water is p_{tr} then the thermodynamic temperature of the gas when the pressure is P

1) 273.16
$$\left(\frac{P}{P_{tr}}\right)$$
K 2) 273.16 $\left(\frac{P-P_{tr}}{P_{tr}}\right)$ K
3) 273.16 $\left(\frac{P_{tr}}{P}\right)$ K 4) 273.16 $\left(\frac{P+P_{tr}}{P}\right)$ K

www.sakshieducation.com

23. On the Celsius scale, the absolute zero of temperature is at

1)
$$0^{0}$$
C 2) -32⁰C 3) 100⁰C 4) -273.15⁰C

24. If a thermometer reads freezing point of water as 20^{0} C and boiling point as 150^{0} C, how much thermometer read when the actual temperature is 60^{0} C

- 1) 98^{0} C 2) 110^{0} C 3) 40^{0} C 4) 60^{0}
- 25. The higher and lower fixed points on a thermometer are separated by 160mm. When the length of the mercury thread above the lower temperature is 40 mm, the temperature reading would be
 - 1) 40^{0} C 2) 120^{0} C 3) 32^{0} C 4) 25^{0} C

KEY

- 1) 4 2) 3 3) 4 4) 4 5) 3 6) 3 7) 4 8) 3 9) 3
- 10) 4 11) 4 12) 3 13) 2 14) 3 15) 4 16) 2 17) 2 18) 3
- 19) 3 20) 1 21) 1 22) 1 23) 4 24) 1 25) 4

HINTS

20.
$$\frac{C}{100} = \frac{F - 32}{180} \quad \text{Here } C = F = x$$

$$\therefore \frac{x}{100} = \frac{x - 32}{180}$$

$$9x = 5x - 160$$

$$\therefore x = -40$$

21.
$$\frac{AC}{100} = \frac{\Delta F}{180}$$

$$\Delta C = \frac{5}{9}(212 - 176) = 20^{0}C$$

22.
$$\frac{P_{1}}{T_{1}} = \frac{P_{2}}{T_{2}}$$

$$\therefore \frac{P_{a}}{273.16} = \frac{P}{T_{2}} \Rightarrow T_{2} = 273.16\left(\frac{P}{P_{a}}\right)$$

23.
$$\frac{C}{100} = \frac{K - 273}{100}$$

$$C = 0 - 273$$

$$\therefore C = -273^{\circ}C$$

24.
$$\frac{C}{100} = \frac{Z - X}{Y - X}$$

$$\frac{60}{100} = \frac{Z - 20}{150 - 20}$$

$$\therefore Z = \frac{490}{5} = 98^{\circ}C$$

25.
$$160 \text{ mm} = 100^{\circ}C$$

$$40 \text{ mm} = ?$$

 $\frac{40}{160} x 100 = 25^{\circ} C$