CHAPTER

12

Thermometry, Thermal Expansion & Calorimetry

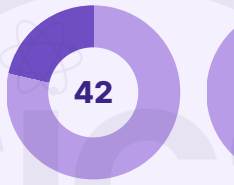
MHT CET · JEE · NEET Physics

PHYSICS CIRCLE

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EXAM WEIGHTAGE



MHT CET 2019–2026 | **JEE Main** 2002–2026 | **NEET** 1988–2026

	CET	JEE	NEET
Thermometry & Thermal Expansion	33 (79%)	36 (46%)	5 (56%)
Calorimetry, Latent Heat & Mechanical Equivalent of Heat	9 (21%)	43 (54%)	4 (44%)

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01 CONCEPT Temperature, Scales & Thermometers

IN ONE LINE

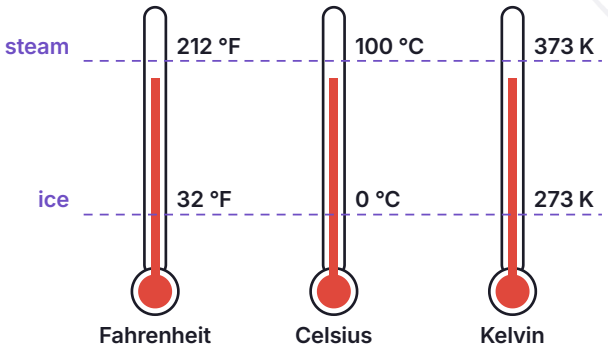
Temperature tells how **hot or cold** a body is; heat always flows from higher to lower temperature.

12.1.1 What temperature means

- One of the seven fundamental quantities; dimension [θ], SI unit **kelvin**.
- Two bodies are in **thermal equilibrium** when no heat flows between them: same temperature.
- Kinetic theory: temperature measures the average translational KE of molecules.
- No upper limit; the lowest possible temperature is 0 K.
- Human body: 37 °C = 98.6 °F = 310.15 K. NTP: 0 °C = 32 °F = 273.15 K.

12.1.2 Two fixed points

- **Lower fixed point** (LFP): ice point. **Upper fixed point** (UFP): steam point.



Same ice and steam points on three scales

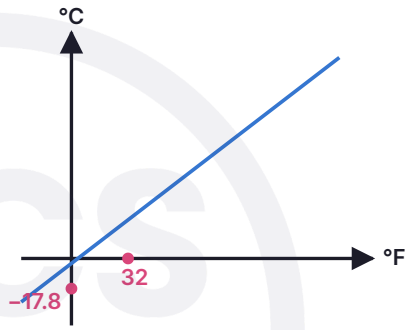
Scale	LFP	UFP	Divisions
Celsius	0 °C	100 °C	100
Fahrenheit	32 °F	212 °F	180
Kelvin	273.15 K	373.15 K	100
Reaumur	0 °R	80 °R	80
Rankine	460 Ra	672 Ra	212

12.1.3 From one scale to another

$$\frac{\text{reading} - \text{LFP}}{\text{UFP} - \text{LFP}} = \text{same on every scale}$$

$$\frac{C}{5} = \frac{F - 32}{9} = \frac{K - 273}{5} = \frac{R}{4}$$

- For a **difference**: $\frac{\Delta C}{5} = \frac{\Delta F}{9} = \frac{\Delta K}{5}$.
- $\Delta C = \Delta K$: one degree Celsius = one kelvin.
- $\Delta F = 1.8\ \Delta C$: one degree Fahrenheit is smaller.
- Same reading on C and F: −40°. Same reading on K and F: 574.25.



C against F: straight line, F-intercept 32

12.1.4 Measuring with a thermometric property

- A property X that changes linearly with temperature: length of a liquid column, pressure of a gas at constant volume, resistance of a platinum wire.
- X_0 and X_{100}: values at 0 °C and 100 °C.

$$t = \frac{X - X_0}{X_{100} - X_0} \times 100\ °C$$

- Modern method: one fixed point, the triple point of water (273.16 K), and 0 K.

$$T = 273.16 \times \frac{X}{X_{Tr}}\ K$$

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12.1.5 Liquid, gas and resistance

- **Mercury thermometer**: large, uniform expansion, good conductor, low specific heat.
- Range about −50 °C to 350 °C (up to 550 °C with nitrogen above the mercury). Alcohol: −80 °C to 350 °C.

$$t = \frac{l - l_0}{l_{100} - l_0} \times 100\ °C$$

- Liquid from a bulb of volume V rising in a stem of area A:

$$l = \frac{V\gamma\Delta\theta}{A}$$

- **Constant volume gas thermometer**: $P \propto T$.

$$t = \frac{P - P_0}{P_{100} - P_0} \times 100\ °C \cdot T = 273.16\ \frac{P}{P_{Tr}}\ K$$

- **Platinum resistance thermometer**: $R = R_0(1 + \alpha t)$; range −200 °C to 1200 °C.

$$t = \frac{R - R_0}{R_{100} - R_0} \times 100\ °C$$

JEE · NEET Corner

Other scales

- **Reaumur**: ice 0 °R, steam 80 °R. **Rankine**: ice 460 Ra, steam 672 Ra.
- In SI the kelvin has no degree sign: write 273 K, not 273 °K.

Constant pressure gas thermometer

- $V \propto T$ at constant P.

$$t = \frac{V - V_0}{V_{100} - V_0} \times 100\ °C \cdot T = 273.16\ \frac{V}{V_{Tr}}\ K$$

- Ranges: hydrogen −200 °C to 500 °C, nitrogen −200 °C to 1600 °C, helium −268 °C to 500 °C.
- Gas thermometers are the most sensitive and are used to standardise others.

Thermoelectric thermometer

- Two different metals form a thermocouple; a temperature difference between the junctions gives an emf (Seebeck effect).

$$e = at + bt^2$$

Thermocouple	Range
copper–iron	0 °C to 260 °C
iron–constantan	0 °C to 800 °C
tungsten–molybdenum	2000 °C to 3000 °C

- Low thermal capacity: reads quickly changing temperature.

Pyrometer and vapour pressure thermometer

- **Pyrometer**: uses radiation ($E \propto T^4$); measures 800 °C to 6000 °C, not below 800 °C.
- **Vapour pressure thermometer**: very low temperatures, 0.71 K to 120 K.

$$\log P = a + bT + \frac{c}{T}$$

- Germanium resistance thermometer: 4 K to 77 K. Magnetic thermometer: near 2 K.

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Solved Examples 01 Temperature, Scales & Thermometers

SOLVED 1 MHT CET 2021 · 21 Sep · Shift 1

Find the value of −197 °C temperature in kelvin.

(a) 47 K (b) 76 K
(c) 470 K (d) 760 K

STEP 1 $T(K) = t(°C) + 273$
STEP 2 $T = -197 + 273$
STEP 3 $T = \mathbf{76\ K}$

Answer: **(b)**

SOLVED 2 MHT CET 2026 · 19 Apr · Shift 1

If two temperatures on the Fahrenheit scale differ by 54 °F, then the difference in temperature on the Celsius scale is

(a) 30 °C (b) 35 °C
(c) 40 °C (d) 45 °C

STEP 1 $\frac{\Delta C}{100} = \frac{\Delta F}{180} \Rightarrow \Delta C = \frac{5}{9}\Delta F$
STEP 2 $\Delta C = \frac{5}{9} \times 54$
STEP 3 $\Delta C = \mathbf{30\ °C}$

Answer: **(a)**

SOLVED 3 JEE Main 2024 · 4 Apr · Shift 1

On the Celsius scale the temperature of a body increases by 40 °C. The increase in temperature on the Fahrenheit scale is

(a) 75 °F (b) 70 °F
(c) 72 °F (d) 68 °F

STEP 1 $\Delta F = \frac{9}{5}\Delta C$
STEP 2 $\Delta F = \frac{9}{5} \times 40$
STEP 3 $\Delta F = \mathbf{72\ °F}$

Answer: **(c)**

SOLVED 4 MHT CET 2025 · 21 Apr · Shift 1

A centigrade and a Fahrenheit thermometer are dipped in boiling water. The water temperature is lowered until the Fahrenheit thermometer reads 140 °F. At that time the centigrade thermometer reads

(a) 80 °C (b) 60 °C
(c) 40 °C (d) 20 °C

STEP 1 $\frac{C}{5} = \frac{F - 32}{9}$
STEP 2 $C = \frac{5}{9}(140 - 32) = \frac{5}{9} \times 108$
STEP 3 $C = \mathbf{60\ °C}$

Answer: **(b)**

SOLVED 5 MHT CET 2026 · 13 Apr · Shift 1

A Celsius and a Fahrenheit thermometer are dipped in boiling water. The temperature of water is lowered until the Fahrenheit thermometer shows 140°. What is the fall in temperature on the Celsius thermometer?

(a) 60 °C (b) 40 °C
(c) 50 °C (d) 80 °C

STEP 1 $140\ °F \Rightarrow C = \frac{5}{9}(140 - 32) = 60\ °C$
STEP 2 Boiling water started at 100 °C
STEP 3 Fall = 100 − 60 = **40 °C**

Answer: **(b)**

SOLVED 6 MHT CET 2025 · 22 Apr · Shift 1

The temperature of a body on the Kelvin scale is x K. When it is measured by a Fahrenheit thermometer, it is found to be x °F. The value of x is (nearly)

(a) 40 (b) 313
(c) 574 (d) 301

STEP 1 $\frac{K - 273}{5} = \frac{F - 32}{9}$ with $K = F = x$
STEP 2 $9x - 2457 = 5x - 160 \Rightarrow 4x = 2297$
STEP 3 $x \approx \mathbf{574}$

Answer: **(c)**

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Solved Examples 01 Temperature, Scales & Thermometers (contd.)

SOLVED 7 MHT CET 2021 · 20 Sep · Shift 1

On an imaginary linear scale of temperature (the W scale) the freezing and boiling points of water are 39 °W and 239 °W. The temperature on the new scale corresponding to 39 °C is

(a) 139 °W (b) 78 °W
(c) 117 °W (d) 200 °W

STEP 1 $\frac{W - LFP}{UFP - LFP}$ is the same on every scale
STEP 2 $\frac{W - 39}{200} = \frac{39}{100}$
STEP 3 W = 78 + 39 = **117 °W**

Answer: **(c)**

SOLVED 8 JEE Main 2013 · 9 Apr · Shift 1

On a linear temperature scale Y, water freezes at −160 °Y and boils at −50 °Y. On this Y scale, a temperature of 340 K would be read as (water freezes at 273 K and boils at 373 K)

(a) −73.7 °Y (b) −233.7 °Y
(c) −86.3 °Y (d) −106.3 °Y

STEP 1 $\frac{Y - (-160)}{-50 - (-160)} = \frac{340 - 273}{373 - 273}$
STEP 2 $\frac{Y + 160}{110} = 0.67 \Rightarrow Y + 160 = 73.7$
STEP 3 Y = **−86.3 °Y**

Answer: **(c)**

SOLVED 9 MHT CET 2026 · 19 May · Shift 1

The length of the mercury column in a mercury-in-glass thermometer is H_1 mm at the ice point and H_2 mm at the steam point. When the length is H mm, the temperature T (in °C) is ($H_1 < H_2$)

(a) $\frac{100(H - H_1)}{H_2 - H_1}$ (b) $\frac{100(H_2 - H)}{H_2 - H_1}$
(c) $\frac{100(H_2 - H_1)}{H - H_1}$ (d) $\frac{100(H_2 - H)}{H - H_1}$

STEP 1 Length of liquid is the thermometric property
STEP 2 $\frac{T - 0}{100 - 0} = \frac{H - H_1}{H_2 - H_1}$
STEP 3 $T = \frac{100(H - H_1)}{H_2 - H_1}$

Answer: **(a)**

SOLVED 10 MHT CET 2026 · 14 May · Shift 1

The coefficient of volume expansion of mercury is 18×10^{-5} /°C. A thermometer bulb has volume 10^{-6} m³ and the cross-section of the stem is 0.004 cm². The bulb is filled with mercury at 0 °C. The length of the mercury column at 100 °C is

(a) 18.8 mm (b) 9.2 mm
(c) 7.4 cm (d) 4.5 cm

STEP 1 $\Delta V = V\gamma\,\Delta\theta = 10^{-6} \times 18 \times 10^{-5} \times 100 = 1.8 \times 10^{-8}$ m³
STEP 2 Stem area = 0.004 cm² = 4×10^{-7} m²
STEP 3 $l = \frac{\Delta V}{A}$ = 0.045 m = **4.5 cm**

Answer: **(d)**

SOLVED 11 MHT CET 2025 · 23 Apr · Shift 1

A thermometer bulb has volume 10^{-6} m³ and the cross-section of the stem is 0.002 cm². The bulb is filled with mercury at 0 °C. If the thermometer reads 100 °C, the length of the mercury column is (γ of mercury = 18×10^{-5} /°C)

(a) 90 cm (b) 9 mm
(c) 9 cm (d) 0.9 mm

STEP 1 $\Delta V = 10^{-6} \times 18 \times 10^{-5} \times 100 = 1.8 \times 10^{-8}$ m³
STEP 2 A = 0.002 cm² = 2×10^{-7} m²
STEP 3 $l = \frac{\Delta V}{A}$ = 0.09 m = **9 cm**

Answer: **(c)**

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02 CONCEPT Linear Expansion

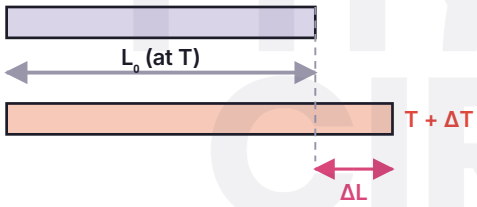
IN ONE LINE

A heated solid gets longer; the increase is proportional to its **original length** and the **rise in temperature**.

12.2.1 Why bodies expand

- Atoms vibrate with larger amplitude when heated.
- The potential energy curve is not symmetric, so the average spacing increases.
- Expansion: least in solids, most in gases.
- Solids: linear, area and volume expansion. Liquids and gases: volume only.

12.2.2 Change in length



Rod of length L_0 heated by ΔT

$$\Delta L = L_0 \alpha \Delta T$$

$$L = L_0(1 + \alpha \Delta T)$$

$$\alpha = \frac{\Delta L}{L_0 \Delta T}$$

- Unit: $°C^{-1}$ or K^{-1} (same value); dimension $[\theta^{-1}]$.
- α depends on the material, not on the unit of length.
- Percentage change in length = αΔT × 100; invar and quartz have very small α.

Material	α (10^{-5} K^{-1})
steel	1.2
copper	1.7
brass	2.0
aluminium	2.4

12.2.3 Two rods whose difference never changes

- Both rods must expand by the same amount.

$$L_1\alpha_1 = L_2\alpha_2$$

- The longer rod has the smaller α.
- If $L_1 - L_2 = d$ (with $\alpha_1 < \alpha_2$):

$$L_1 = \frac{d\alpha_2}{\alpha_2 - \alpha_1} \cdot L_2 = \frac{d\alpha_1}{\alpha_2 - \alpha_1}$$

12.2.4 Two rods joined end to end

- Total expansion = sum of the two expansions.

$$\alpha_{eff} = \frac{L_1\alpha_1 + L_2\alpha_2}{L_1 + L_2}$$

- Equal lengths: $\alpha_{eff} = \frac{\alpha_1 + \alpha_2}{2}$.
- Each part expands by the same amount ⇒ again $L_1\alpha_1 = L_2\alpha_2$.

12.2.5 Everyday problems

- Rail gap = expansion of one rail = $L_0\alpha\Delta T$.
- A ring or tyre slightly smaller than the wheel is heated until it fits:

$$\Delta T = \frac{\Delta D}{D\alpha}$$

- The hole of a ring grows exactly like the metal around it.
- Equal rise twice: $\Delta L_2 = \Delta L_1(1 + \alpha\Delta T)$, since the rod is already longer.

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THERMOMETRY, THERMAL EXPANSION & CALORIMETRY

LEVEL 1 · EASY

Topic-wise Previous Year Questions

MHT CET · NEET · JEE Main

31	6	2
questions	concepts	topics

CONTENTS

01	Thermometry & Thermal Expansion	Q 1–20	20 Qs
02	Calorimetry, Latent Heat & Mechanical Equivalent of Heat	Q 21–31	11 Qs
	Answer key		

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TOPIC 01

Thermometry & Thermal Expansion

20 PYQs · Easy 20 · Medium 0 · Difficult 0 | MHT CET 11 · NEET 3 · JEE 6

Concepts covered: Temperature scales & thermometers (11) · Linear expansion (2) · Area & volume expansion (5) · Thermal stress, pendulum & liquids (2)

LEVEL 1 · EASY 20 questions

◆ Temperature scales & thermometers 11 Qs

1. The length of mercury column in a mercury-in-glass thermometer is H_1 mm at the ice point and H_2 mm at the steam point. When the length is H mm, the temperature T is given in °C by $(H_1 < H_2)$

MHT CET 2026 · 19 MAY · SHIFT 1

(a) $\frac{100(H-H_1)}{(H_2-H_1)}$ (b) $\frac{100(H_2-H)}{(H_2-H_1)}$ (c) $\frac{100(H_2-H_1)}{(H-H_1)}$ (d) $\frac{100(H_2-H)}{(H-H_1)}$

2. If the two temperatures on Fahrenheit scale differ by $54°F$, then the difference in temperature on the Celsius scale is

MHT CET 2026 · 19 APR · SHIFT 1

(a) $30°C$ (b) $35°C$ (c) $40°C$ (d) $45°C$

3. The temperature of a body on Kelvin scale is ' x ' K. When it is measured by a Fahrenheit thermometer, it is found to be ' x ' °F. The value of ' x ' is (nearly)

MHT CET 2025 · 22 APR · SHIFT 1

(a) 40 (b) 313 (c) 574 (d) 301

4. A centigrade and Fahrenheit thermometer are dipped in boiling water. The water temperature is lowered until the Fahrenheit temperature observed is $140°F$. At that time the temperature registered by the centigrade thermometer is

MHT CET 2025 · 21 APR · SHIFT 1

(a) $80°C$ (b) $60°C$ (c) $40°C$ (d) $20°C$

5. Find the value of – 197°C temperature in Kelvin.

MHT CET 2021 · 21 SEP · SHIFT 1

(a) 47 K (b) 76 K (c) 470 K (d) 760 K

6. On an imaginary linear scale of temperature (called 'W' scale) the freezing and boiling points of water are 39° W and 239° W respectively. The temperature on the new scale corresponding to 39 °C temperature on Celsius scale will be

MHT CET 2021 · 20 SEP · SHIFT 1

(a) 139° W (b) 78° W (c) 117° W (d) 200° W

7. Mercury thermometer can be used to measure temperature upto

AIPMT 1992

(a) $260°C$ (b) $100°C$ (c) $360°C$ (d) $500°C$

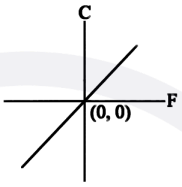
8. A Centigrade and a Fahrenheit thermometer are dipped in boiling water. The water temperature is lowered until the Fahrenheit thermometer registers $140°F$. What is the fall in temperature as registered by the centigrade thermometer?

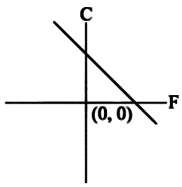
AIPMT 1990

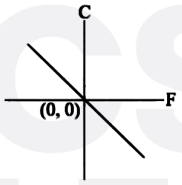
(a) $80°C$ (b) $60°C$ (c) $40°C$ (d) $30°C$

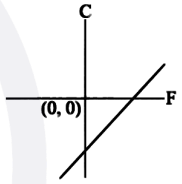
9. Which of the following figure represents the relation between Celsius and Fahrenheit temperatures?

JEE MAIN 2025 · 24 JAN · SHIFT 2

(a) 

(b) 

(c) 

(d) 

10. On Celsius scale the temperature of body increases by $40°C$. The increase in temperature on Fahrenheit scale is:

JEE MAIN 2024 · 4 APR · SHIFT 1

(a) $75°F$ (b) $70°F$ (c) $72°F$ (d) $68°F$

11. On a linear temperature scale Y, water freezes at $-160°$ Y and boils at $-50°$ Y. On this Y scale, a temperature of 340 K would be read as: (water freezes at 273 K and boils at 373 K)

JEE MAIN 2013 · 9 APR · SHIFT 1

(a) $-73.7°$ Y (b) $-233.7°$ Y (c) $-86.3°$ Y (d) $-106.3°$ Y

◆ Linear expansion 2 Qs

12. A metal rod having coefficient of linear expansion $2 \times 10^{-5}/°C$ is 0.75 m long at $45°C$. When the temperature rises to $65°C$, the increase in length of the rod will be

MHT CET 2024 · 11 MAY · SHIFT 2

(a) 3.0 mm (b) 0.75 mm (c) 0.30 mm (d) 0.15 mm

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13. A metal rod $2\ \text{m}$ long increases in length by $1.6\ \text{mm}$, when heated from $0°\text{C}$ to $60°\text{C}$. The coefficient of linear expansion of metal rod is

MHT CET 2023 · 10 MAY · SHIFT 2

(a) $1.33 \times 10^{-5}/°\text{C}$ (b) $1.66 \times 10^{-5}/°\text{C}$
(c) $1.33 \times 10^{-3}/°\text{C}$ (d) $1.66 \times 10^{-3}/°\text{C}$

◆ Area & volume expansion 5 Qs

14. What is the change in volume of an iron sphere of volume $400\ \text{cm}^3$, when it is heated from $0°C$ to $50°C$? ($\alpha_{iron} = 12 \times 10^{-6}/°C$)

MHT CET 2026 · 12 MAY · SHIFT 2

(a) $0.36\ cm^3$ (b) $0.18\ cm^3$ (c) $0.72\ cm^3$ (d) $0.54\ cm^3$

15. The volume of a metal sphere increases by 0.33% when its temperature is raised by $50°\text{C}$. The coefficient of linear expansion of the metal is

MHT CET 2025 · 25 APR · SHIFT 2

(a) $2.2 \times 10^{-5}/°\text{C}$ (b) $6.6 \times 10^{-5}/°\text{C}$
(c) $13.2 \times 10^{-5}/°\text{C}$ (d) $19.8 \times 10^{-5}/°\text{C}$

16. The volume of a metal block increases by 0.225% when its temperature is increased by $30°\text{C}$. Hence coefficient of linear expansion of the material of metal block is

MHT CET 2023 · 12 MAY · SHIFT 2

(a) $7.5 \times 10^{-5}/°\text{C}$. (b) $6.75 \times 10^{-5}/°\text{C}$.
(c) $2.5 \times 10^{-5}/°\text{C}$. (d) $1.5 \times 10^{-5}/°\text{C}$.

17. The temperature of a metallic sphere of radius R is increased by a small amount ΔT. If the linear coefficient of thermal expansion of the metal is α, the approximate increase in the volume of the sphere is:

RE-NEET 2026

(a) $6\pi R^3\alpha\Delta T$ (b) $2\pi R^3\alpha\Delta T$
(c) $3\pi R^3\alpha\Delta T$ (d) $4\pi R^3\alpha\Delta T$

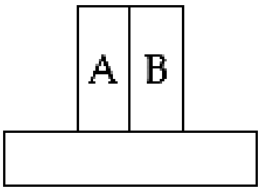
18. A non-isotropic solid metal cube has coefficients of linear expansion as:
5×10^{-5}/°C along the x-axis and 5×10^{-6}/°C along the y and the z-axis. If the coefficient of volume expansion of the solid is $C \times 10^{-6}$/°C then the value of C is

JEE MAIN 2020 · 7 JAN · SHIFT 1 *(Numerical)*

◆ Thermal stress, pendulum & liquids 2 Qs

19. A bimetallic strip consists of metals A and B. It is mounted rigidly as shown. The metal A has higher coefficient of expansion compared to that of metal B. When the bimetallic strip is placed in a cold bath, it will:

JEE MAIN 2021 · 16 MAR · SHIFT 2



(a) Neither bend nor shrink
(b) Bend towards the left
(c) Not bend but shrink
(d) Bend towards the right

20. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.
Assertion A: When a rod lying freely is heated, no thermal stress is developed in it. Reason R: On heating, the length of the rod increases.
In the light of the above statements, choose the correct answer from the options given below:

JEE MAIN 2021 · 25 FEB · SHIFT 1

(a) A is true but R is false
(b) A is false but R is true
(c) Both A and B are true but R is NOT the correct explanation of A
(d) Both A and R are true and R is the correct explanation of A

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TOPIC 02

Calorimetry, Latent Heat & Mechanical Equivalent of Heat

11 PYQs · Easy 11 · Medium 0 · Difficult 0 | MHT CET 1 · NEET 1 · JEE 9

Concepts covered: Specific heat, thermal capacity & Joule's law (8) · Latent heat, phase change & heating curve (3)

LEVEL 1 · EASY 11 questions

◆ Specific heat, thermal capacity & Joule's law 8 Qs

21. Heat given to a body, which raises its temperature by 1ºC is known as
MHT CET 2022 · 11 AUG · SHIFT 2
(a) specific heat (b) thermal capacity
(c) water equivalent (d) temperature gradient

22. Thermal capacity of 40 g of aluminium ($s = 0.2$ cal/g K) is
AIPMT 1990
(a) 168 J/K (b) 672 J/K
(c) 840 J/K (d) 33.6 J/K

23. Water falls from a height of 200 m into a pool. Calculate the rise in temperature of the water assuming no heat dissipation from the water in the pool.
(Take g = 10 m/s^2, specific heat of water = 4200 J/(kg K))
JEE MAIN 2025 · 8 APR · SHIFT 2
(a) 0.36 K (b) 0.23 K (c) 0.48 K (d) 0.14 K

24. The height of Victoria falls is 63 m. What is the difference in temperature of water at the top and at the bottom of fall?
[Given 1 cal = 4.2 J and specific heat of water = 1 cal g^{-1} °C^{-1}]
JEE MAIN 2021 · 27 AUG · SHIFT 2
(a) 0.147° C (b) 14.76 ° C (c) 1.476° C (d) 0.014° C

25. 200 g water is heated from 40ºC to 60ºC. Ignoring the slight expansion of water, the change in its internal energy is close to (Given specific heat of water = 4184 J/kg/K):
JEE MAIN 2016 · 9 APR · SHIFT 1
(a) 8.4 kJ (b) 4.2 kJ (c) 16.7 kJ (d) 167.4 kJ

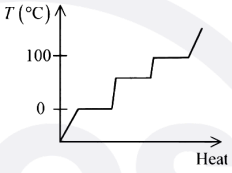
26. $100g$ of water is heated from $30^\circ C$ to $50^\circ C$. Ignoring the slight expansion of the water, the change in its internal energy is (specific heat of water is 4184 $J/kg/K$):
AIEEE 2011
(a) 8.4 kJ (b) 84 kJ (c) 2.1 kJ (d) 4.2 kJ

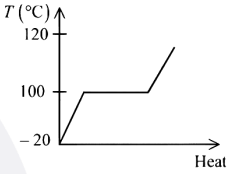
27. Time taken by a 836 W heater to heat one litre of water from $10^\circ C$ to $40^\circ C$ is
AIEEE 2004
(a) 150 s (b) 100 s (c) 50 s (d) 200 s

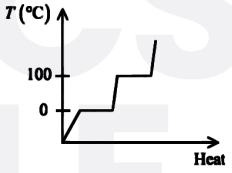
28. Heat given to a body which raises its temperature by $1^\circ C$ is
AIEEE 2002
(a) water equivalent (b) thermal capacity
(c) specific heat (d) temperature gradient

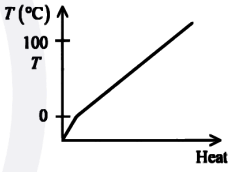
◆ Latent heat, phase change & heating curve 3 Qs

29. Which of the following best represents the temperature versus heat supplied graph for water, in the range of -20°C to 120°C?
JEE MAIN 2026 · 28 JAN · SHIFT 1

(a)


(b)


(c)


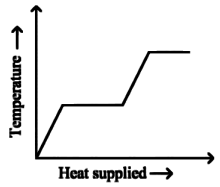
(d)


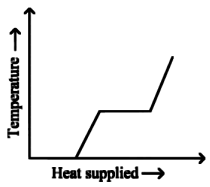
30. Match List - I with List - II.
List - I $List - II$
(A) Heat capacity of body (I) J kg^{-1}
(B) Specific heat capacity of body (II) J K^{-1}
(C) Latent heat (III) J kg^{-1} K^{-1}
(D) Thermal conductivity (IV) J m^{-1} K^{-1} s^{-1}
Choose the correct answer from the options given below:
JEE MAIN 2025 · 2 APR · SHIFT 2
(a) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)
(b) (A)-(III), (B)-(I), (C)-(II), (D)-(IV)
(c) (A)-(III), (B)-(IV), (C)-(I), (D)-(II)
(d) (A)-(II), (B)-(III), (C)-(I), (D)-(IV)

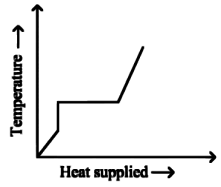
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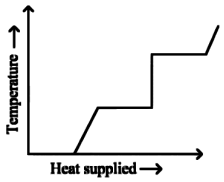
31. A block of ice at $-10^{\circ}C$ is slowly heated and converted to steam at $100^{\circ}C$. Which of the following curves represent the phenomenon qualitatively:

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(a) 

(b) 

(c) 

(d) 

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ANSWER KEY

Shaded by level: **Easy**

01 Thermometry & Thermal Expansion

1. (a)	2. (a)	3. (c)	4. (b)	5. (b)	6. (c)	7. (c)	8. (c)	9. (d)	10. (c)
11. (c)	12. (c)	13. (a)	14. (c)	15. (a)	16. (c)	17. (d)	18. 60	19. (b)	20. (c)

02 Calorimetry, Latent Heat & Mechanical Equivalent of Heat

21. (b)	22. (d)	23. (c)	24. (a)	25. (c)	26. (a)	27. (a)	28. (b)	29. (c)	30. (d)
31. (a)									

Note: *"Bonus" = no option is correct as the question is printed (dropped in the official key). Numerical questions show the numerical answer.*

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