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PHYSICS · EAPCET (EAMCET)

Thermal Properties of Matter

Previous Year Questions with answers

255 questions · **142** papers · **2010–2026** · newest paper first

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What is in this PDF: every Thermal Properties of Matter question we hold from past AP and TS EAPCET (called EAMCET until 2020 in Andhra Pradesh and 2023 in Telangana) papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

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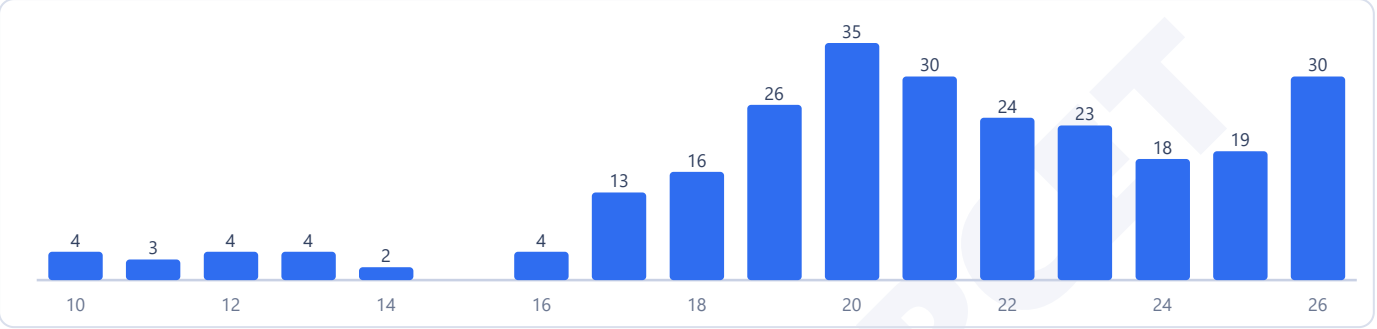
Chapter at a glance

3.7%	255	73 of 77	255 / 0
of Physics questions, 2022–2026	questions, 2010–2026	papers asked it, 2022–2026	MCQ / numerical, 2010–2026

Trend. Steady: 1.5 questions per paper in 2024–2026 against 1.5 in 2022–2023.

Questions per year



Counts are the questions we hold: 255 in 142 papers. No question in this chapter was found repeated across papers.

Most-asked topics in this chapter (2010–2026)

Calorimetry	86
Thermal Expansion	64
Radiation	60
Conduction	45

How often it comes up

Thermal Properties of Matter is a core component of heat and thermodynamics in Class 11 physics. In the papers we hold for AP and TS EAPCET between 2022 and 2026, the chapter accounted for 114 questions across 77 papers. That gives an average frequency of 1.5 questions per paper, making up 3.7% of all physics questions in that recent window. Taking in all years in our archive from 2010 to 2026, Thermal Properties of Matter contributed 255 questions across 149 papers, maintaining an average of 1.7 questions per paper and a 4.3% subject share. During the earlier period from 2010 to 2021, our archive contains 141 questions across 72 papers, representing 2.0 questions per paper and a 4.9% share. Across the last three exam years from 2024 to 2026, the chapter delivered 67 questions across 46 papers, holding a 3.6% share. The share of the subject in the last three years compared to early papers is down, while compared to the recent five-year window it is about the same.

State-wise breakdowns show that TS EAPCET papers examine this topic more heavily than AP papers. From 2022 to 2026, AP EAPCET papers in our set provided 58 questions across 48 papers, with 44 papers containing at least one question (1.2 per paper, 3.0% share). Over the same period, TS EAPCET contributed 56 questions across 29 papers in our set, with all 29 papers featuring questions from the chapter (1.9 per paper, 4.8% share). Thermal Properties of Matter has appeared every year since 2022, though across all 77 recent papers in our collection, four AP papers omitted it, meaning it did not feature in all 77 sittings. It ranks 11th of 28 physics chapters by question share between 2022 and 2026. The busiest single sitting in our collection was 2020, which saw 35 questions across 18 papers.

Most-asked topics

Questions distribute across four major areas:

- **Calorimetry**: 50 questions in the recent 2022–2026 period and 86 questions across all years in our archive. Key concepts test specific heat capacity, latent heat of fusion and vaporisation, principle of mixtures, water equivalent, and temperature scales.
- **Thermal Expansion**: 28 questions between 2022 and 2026 and 64 questions across all years. This area covers linear, superficial, and cubical expansion of solids, apparent expansion of liquids in vessels, bimetallic strips, and anomalous expansion of water.
- **Radiation**: 22 questions in the recent period and 60 questions across all years. Topics include Stefan-Boltzmann law, Wien's displacement law, Newton's law of cooling, and blackbody emission spectra.
- **Conduction**: 14 questions between 2022 and 2026 and 45 questions across all years. It tests steady-state heat current, thermal conductivity, equivalent conductivity of rods in series or parallel, and temperature of junctions.

What the questions look like

Calorimetry questions typically involve mixing ice, water, and steam inside a container of known heat capacity. You must determine the equilibrium temperature and the final mass of each phase present. Watch out for incomplete melting where final temperature remains at the melting point. Thermometer calibration questions also show up, where a faulty scale with non-standard ice and steam points must be converted to standard Celsius or Fahrenheit readings.

In heat transfer, radiation problems heavily favour Newton's law of cooling in its approximate average-temperature form, asking for the time required to cool between two temperatures under specified ambient conditions. Conduction problems test composite cylindrical or rectangular slabs connected either end-to-end or side-by-side, requiring the interface temperature or effective thermal resistance.

How to practise it

Start by mastering temperature conversion scales. Set up the invariant linear relation (Reading - Lower Fixed Point) / (Upper Fixed Point - Lower Fixed Point) = constant. Use this ratio directly for custom scales, faulty mercury thermometers, and resistance thermometers.

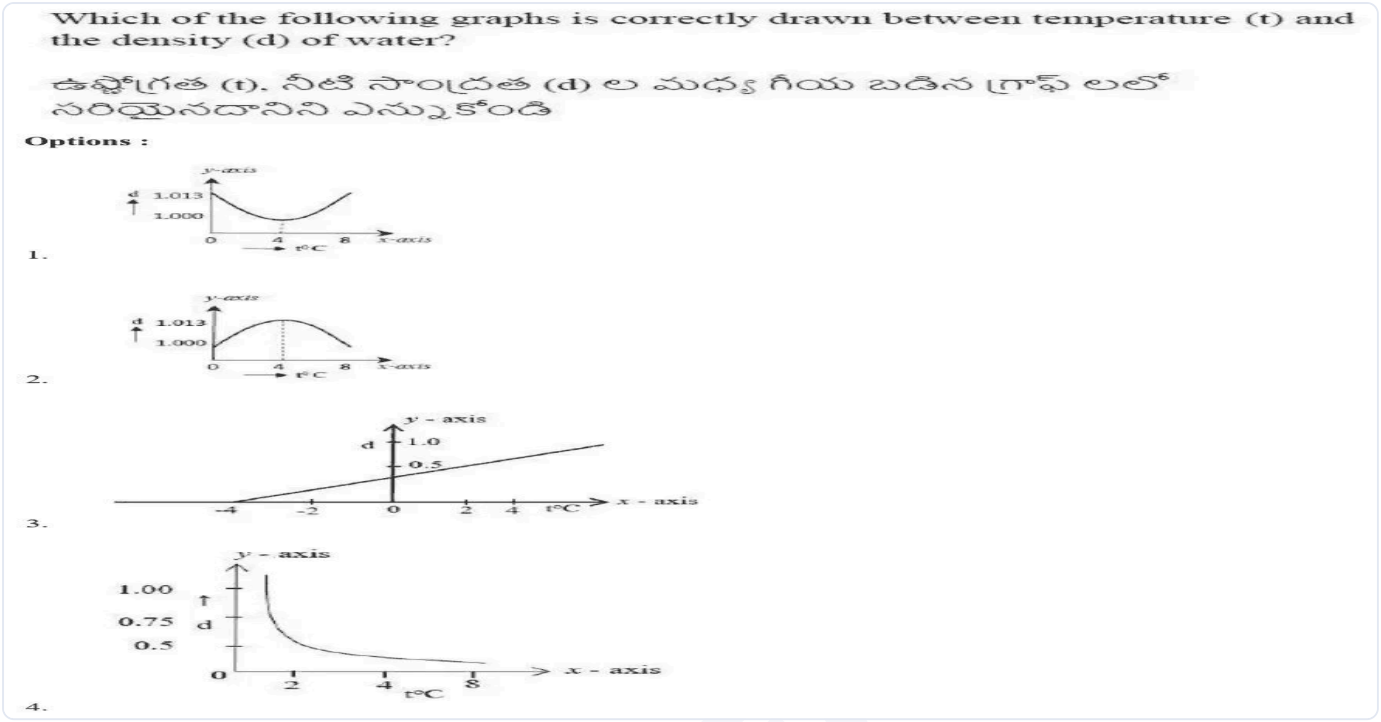
In calorimetry, write the conservation of heat energy clearly: heat lost by warmer components equals heat gained by cooler components. Always verify whether latent heat requirements can be satisfied by the sensible heat released before assuming complete phase conversion.

For thermal expansion, remember the standard relationships between coefficients: superficial expansion coefficient β equals two times linear expansion coefficient α, and volume expansion coefficient γ equals three times α for isotropic solids. For liquid in a flask, the apparent volume expansion coefficient equals real volume expansion coefficient minus vessel expansion coefficient.

Finally, review the laws of radiation and cooling. For Stefan's law, radiated power scales with the fourth power of absolute temperature T. For Newton's law of cooling, use the standard difference approximation: rate of temperature drop (T_initial - T_final) / t = k [(T_initial + T_final) / two - T_surrounding].

Q1 AP EAPCET 2026 · 18 May · Shift 1 MCQ

Which of the following graphs is correctly drawn between temperature (t) and the density (d) of water?



(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (B) · The council's preliminary key

Q2 AP EAPCET 2026 · 18 May · Shift 1 MCQ

Two metal rods A and B have lengths in the ratio 1:2, thermal conductivities in the ratio 1:2 and cross sectional areas in the ratio 1:4. The ends of the two rods are maintained between same temperature difference, then the ratio of heat currents $\left(\frac{H_A}{H_B}\right)$ is

(A) 1 : 4
(B) 4 : 1
(C) 2 : 1
(D) 1 : 2

Answer: (A) 1 : 4 · The council's preliminary key

Q3 AP EAPCET 2026 · 18 May · Shift 2 MCQ

A body cools from 80°C to 50°C in 5 min. Calculate the time it takes to cool from 60°C to 30°C, if the surrounding temperature is 20°C

(A) 5 min
(B) 8 min
(C) 9 min
(D) 6 min

Answer: (C) 9 min · The council's preliminary key

Q4 AP EAPCET 2026 · 18 May · Shift 2 MCQ

A spherical perfect black body of radius $10\ cm$ is maintained at $727^{\circ}\mathrm{C}$. The total power radiated from it is (approximately)
Stefan-Boltzmann constant, $\sigma = 5.67 \times 10^{-8}\ Wm^{-2}K^{-4}$

(A) $7120\ W$
(B) $7270\ W$
(C) $1000\ W$
(D) $7000\ W$

Answer: (A) $7120\ W$ · The council's preliminary key

Q5 AP EAPCET 2026 · 15 May · Shift 1 MCQ

Two semicircular rods AB and CD each of radius of curvature 14 cm and a straight rod BC of length 22 cm are connected in series. The three rods have equal area of cross-section and the thermal conductivities of the materials of the rods AB, BC and CD are in the ratio 1:2:3. In steady state, if the temperature difference between the ends of the middle rod BC is 30°C, then the temperature difference between the ends of the rods AB and CD are respectively

(A) $120^{\circ}\mathrm{C}, 40^{\circ}\mathrm{C}$
(B) $60^{\circ}\mathrm{C}, 20^{\circ}\mathrm{C}$
(C) $120^{\circ}\mathrm{C}, 60^{\circ}\mathrm{C}$
(D) $60^{\circ}\mathrm{C}, 40^{\circ}\mathrm{C}$

Answer: (A) $120^{\circ}\mathrm{C}, 40^{\circ}\mathrm{C}$ · The council's preliminary key

Q6 AP EAPCET 2026 · 15 May · Shift 1 MCQ

If the temperature of a steel solid sphere of mass 4 kg and radius 5 cm is increased by $10^{\circ}\mathrm{C}$, then the increase in the moment of inertia of the sphere about its diameter is
(Coefficient of linear expansion of steel = $1.2 \times 10^{-5}\ K^{-1}$)

(A) $3.6\ \text{g cm}^2$
(B) $4.8\ \text{g cm}^2$
(C) $2.4\ \text{g cm}^2$
(D) $9.6\ \text{g cm}^2$

Answer: (D) $9.6\ \text{g cm}^2$ · The council's preliminary key

Q7 AP EAPCET 2026 · 15 May · Shift 1 MCQ

A geyser heats water flowing at the rate of 3.0 liters per minute from 27°C to 77°C. If the geyser operates on a gas burner and if its heat of combustion is $4.0 \times 10^4\ \text{Jg}^{-1}$, the rate of combustion of the fuel per minute is

(A) $15.75 \times 10^{-3}\ \text{g}$
(B) $15.75\ \text{g}$
(C) $252\ \text{g}$
(D) $252 \times 10^{-3}\ \text{g}$

Answer: (B) $15.75\ \text{g}$ · The council's preliminary key

Q8 AP EAPCET 2026 · 15 May · Shift 2 MCQ

A beaker contains 200 gm of water. The heat capacity of the beaker is equal to that of 20 gm of water. The initial temperature of water in the beaker is 20^0C. If 440 gm of hot water at 92^0C is poured in it, the final temperature (neglecting radiation loss) will be nearest to

(A) 58^0C
(B) 68^0C
(C) 78^0C
(D) 73^0C

Answer: (B) 68^0C · The council's preliminary key

Q9 AP EAPCET 2026 · 15 May · Shift 2 MCQ

Hot water cools from 60^0C to 50^0C in the first 10 min and to 42^0C in the next 10 min. Then the temperature of the surroundings is

(A) 20^0C
(B) 30^0C
(C) 15^0C
(D) 10^0C

Answer: (D) 10^0C · The council's preliminary key

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Q10 AP EAPCET 2026 · 14 May · Shift 1 MCQ

Heat energy released by water of mass $3\ kg$ when it is cooled by $20^{\circ}\mathrm{C}$ is (specific heat capacity of water $= 4200\ \mathrm{J}\ kg^{-1}K^{-1}$)

(A) $252000\ \mathrm{J}$
(B) $420000\ \mathrm{J}$
(C) $52000\ \mathrm{J}$
(D) $25200\ \mathrm{J}$

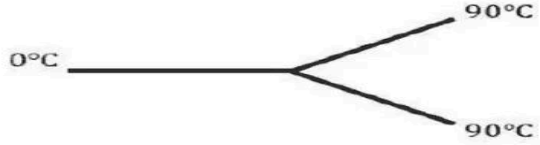
Answer: (A) $252000\ \mathrm{J}$ · The council's preliminary key

Q11 AP EAPCET 2026 · 14 May · Shift 1 MCQ

Three rods made of the same material and having the same cross-section have been joined as shown in figure. Each rod is of same length. The left and right ends of the arrangement are kept at $0^{\circ}\mathrm{C}$ and $90^{\circ}\mathrm{C}$ respectively. The temperature of the junction of the three rods will be

(see the figure above)

Three rods made of the same material and having the same cross-section have been joined as shown in figure. Each rod is of same length. The left and right ends of the arrangement are kept at 0°C and 90°C respectively. The temperature of the junction of the three rods will be



ఒకే పదార్థం తో చేయబడి, ఒకే మధ్యచ్ఛేద వైశాల్యం గల మూడు కడ్డీలు పటంలో చూపినట్లు కలపబడినాయి. అన్ని కడ్డీల పొడవులు సమానం మరియు ఈ అమరిక యొక్క ఎడమ, కుడి చివరలు వరుసగా 0°C మరియు 90°C వద్ద ఉంచబడ్డాయి. అయితే, మూడు కడ్డీల సంధి వద్ద ఉష్ణోగ్రత

Options :

1. 45°C
2. 60°C
3. 30°C
4. 20°C

(A) $45^{\circ}\mathrm{C}$
(B) $60^{\circ}\mathrm{C}$
(C) $30^{\circ}\mathrm{C}$
(D) $20^{\circ}\mathrm{C}$

Answer: (B) $60^{\circ}\mathrm{C}$ · The council's preliminary key

Q12 AP EAPCET 2026 · 14 May · Shift 2 MCQ

Two rods made of metals A and B , each of length 20cm expand by 0.075cm and 0.045cm respectively, when heated from 0°C to 100°C. A composite rod of same length is made with a portion

of metal A and remaining with B expands by 0.060cm for same rise of temperature. Then the portion of composite rod made of A has initial length

(A) $8\ cm$
(B) $10\ cm$
(C) $15\ cm$
(D) $18\ cm$

Answer: (B) $10\ cm$ · The council's preliminary key

Q13 AP EAPCET 2026 · 13 May · Shift 1 MCQ

A blackened platinum wire of surface area $10^{-5}\ m^2$ is maintained at temperature of 3000K. At what rate the wire is loosing energy [Stefen $-$ Boltzman constant $\sigma = 5.67 \times 10^{-8}\ W\ m^{-2}K^{-4}$]

(A) 50 W
(B) 46 W
(C) 76 W
(D) 38 W

Answer: (B) 46 W · The council's preliminary key

Q14 AP EAPCET 2026 · 13 May · Shift 1 MCQ

An earthen pitcher containing $9.5\ kg$ of water loses one gram of water per minute due to evaporation. If water equivalent of pitcher is $0.5\ kg$. The time required to cool the water in pitcher from $30^{\circ}\mathrm{C}$ to $28^{\circ}\mathrm{C}$ is
(Neglect radiation effect and Take latent heat of vaporization $500\ cal\ g^{-1}$)

(A) $30\ min$
(B) $60\ min$
(C) $40\ min$
(D) $20\ min$

Answer: (C) $40\ min$ · The council's preliminary key

Q15 AP EAPCET 2026 · 13 May · Shift 2 MCQ

Which of the following graphs shows the variation of volume expansion coefficient of copper with temperature?

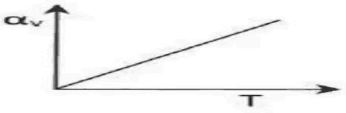
Which of the following graphs shows the variation of volume expansion coefficient of copper with temperature?

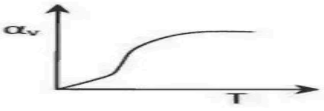
ఈ క్రింది వాటిలో ఏది ఉష్ణోగ్రత తో రాగి ఘన పరిమాణ వ్యాకోచక గుణకం యొక్క మార్పును సూచిస్తుంది?

Options :

1. 

2. 

3. 

4. 

(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) *see figure*

Answer: (D) · The council's preliminary key

Q16 AP EAPCET 2026 · 13 May · Shift 2 MCQ

Two rods A and B of lengths in ratio of $1:2$ have thermal conductivities in $1:2$ ratio and cross sectional areas in $1:4$ ratio. The temperature difference between the ends of two rods is same. Then the ratio of heat currents is $(H_A:H_B)$

(A) $1:4$

(B) $4:1$

(C) $2:1$

(D) $1:2$

Answer: (A) $1:4$ · The council's preliminary key

Q17 AP EAPCET 2026 · 12 May · Shift 1 MCQ

How much should the temperature of a metal ring of diameter $100\ cm$ to be raised in order to fit it on a wooden disc of diameter $100.6\ cm$ [coefficient of linear expansion of metal $= 12 \times 10^{-6}\ ^{\circ}\mathrm{C}^{-1}$]

(A) $300^{\circ}\mathrm{C}$
(B) $400^{\circ}\mathrm{C}$
(C) $500^{\circ}\mathrm{C}$
(D) $600^{\circ}\mathrm{C}$

Answer: (C) $500^{\circ}\mathrm{C}$ · The council's preliminary key

Q18 AP EAPCET 2026 · 12 May · Shift 2 MCQ

At what temperature, Celsius scale and Fahrenheit scale will coincide

(A) $-20^{0}\mathrm{C}$
(B) $-40^{0}\mathrm{C}$
(C) $-60^{0}\mathrm{C}$
(D) $-80^{0}\mathrm{C}$

Answer: (B) $-40^{0}\mathrm{C}$ · The council's preliminary key

Q19 AP EAPCET 2026 · 12 May · Shift 2 MCQ

When an iron rod is heated, the variation of color from dull red to white can be explained by

(A) Boltzman law
(B) Newton's law of cooling
(C) Stefen's law of radiation
(D) Wien's displacement law

Answer: (D) Wien's displacement law · The council's preliminary key

Q20 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If Q_1 is the heat required to convert 2 g of ice at a temperature of $0\ ^{\circ}\mathrm{C}$ to water at a temperature of $40\ ^{\circ}\mathrm{C}$ and Q_2 is the heat required to convert 4 g of ice at a temperature of $0\ ^{\circ}\mathrm{C}$ to water at a temperature of $80\ ^{\circ}\mathrm{C}$, then $Q_1 : Q_2 =$

(Latent heat of fusion of ice $= 80\ \mathrm{cal\,g^{-1}}$ and specific heat capacity of water $= 1\ \mathrm{cal\,g^{-1}\,^{\circ}C^{-1}}$)

(A) $3 : 8$
(B) $1 : 2$
(C) $1 : 4$
(D) $3 : 4$

Answer: (A) $3 : 8$ · The council's preliminary key

Q21 TS EAPCET 2026 · 11 May · Shift 1 MCQ

Two rectangular metal boxes A and B having same dimensions are made of different materials of thermal conductivities $180\ \mathrm{W\,m^{-1}\,K^{-1}}$ and $270\ \mathrm{W\,m^{-1}\,K^{-1}}$ respectively. The two boxes are

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completely filled with ice and are placed in identical surroundings. If the time taken by the ice in box A to completely melt is 21 minutes, then the time taken in minutes for half of the mass of ice in box B to melt is

(A) 14
(B) 7
(C) 10.5
(D) 42

Answer: (B) 7 · The council's preliminary key

Q22 TS EAPCET 2026 · 11 May · Shift 2 MCQ

Ice of mass 80 g at a temperature of $-10\ ^\circ\mathrm{C}$ is mixed with water of mass 100 g at a temperature of $20\ ^\circ\mathrm{C}$. The ratio of the masses of ice and water in the mixture in equilibrium is
(Latent heat of fusion of ice $= 80\ \mathrm{cal\,g^{-1}}$, specific heat capacities of water and ice are $1\ \mathrm{cal\,g^{-1}\,^\circ C^{-1}}$ and $0.5\ \mathrm{cal\,g^{-1}\,^\circ C^{-1}}$ respectively)

(A) $4:5$
(B) $1:2$
(C) $2:3$
(D) $3:4$

Answer: (B) $1:2$ · The council's preliminary key

Q23 TS EAPCET 2026 · 10 May · Shift 1 MCQ

If the numerical value of the temperature of a body on Fahrenheit scale is 80 more than its numerical value on Celsius scale, then the temperature of the body is

(A) $120\ ^\circ\mathrm{F}$
(B) $120\ ^\circ\mathrm{C}$
(C) $60\ ^\circ\mathrm{F}$
(D) $60\ ^\circ\mathrm{C}$

Answer: (D) $60\ ^\circ\mathrm{C}$ · The council's preliminary key

Q24 TS EAPCET 2026 · 10 May · Shift 1 MCQ

If t_1 is time taken for a body to cool from temperature of $80\ ^\circ\mathrm{C}$ to $75\ ^\circ\mathrm{C}$ and t_2 is time taken to cool from $75\ ^\circ\mathrm{C}$ to $70\ ^\circ\mathrm{C}$, then $t_1 : t_2 =$
(Temperature of surroundings $= 30\ ^\circ\mathrm{C}$)

(A) $19 : 21$
(B) $17 : 19$
(C) $7 : 9$
(D) $9 : 11$

Answer: (B) $17 : 19$ · The council's preliminary key

Q25 TS EAPCET 2026 · 10 May · Shift 2 MCQ

Steam at a temperature of 100 °C is passed into water of mass 90 g such that the temperature of the water increases from 20 °C to 40 °C. Then the total mass of the water at 40 °C is

(A) 3 g
(B) 93 g
(C) 30 g
(D) 120 g

Answer: (B) 93 g · The council's preliminary key

Q26 TS EAPCET 2026 · 10 May · Shift 2 MCQ

The percentage error in the measurement of length when a metal scale calibrated at $30\ ^\circ\mathrm{C}$ is used at $-10\ ^\circ\mathrm{C}$ is

(Coefficient of linear expansion of the metal $= 12 \times 10^{-6}\ ^\circ\mathrm{C}^{-1}$)

(A) 0.024
(B) 0.036
(C) 0.048
(D) 0.012

Answer: (C) 0.048 · The council's preliminary key

Q27 TS EAPCET 2026 · 9 May · Shift 1 MCQ

An iron rod of mass 2 kg and length 1.5 m is supplied 18.4 kJ of heat. If the specific heat capacity of iron is $460\ \mathrm{J\,kg^{-1}\,K^{-1}}$ and its coefficient of linear expansion is $1.2 \times 10^{-5}\ ^\circ\mathrm{C}^{-1}$, then the increase in the length of the rod is

(A) 0.24 mm
(B) 0.36 mm
(C) 0.12 mm
(D) 0.18 mm

Answer: (B) 0.36 mm · The council's preliminary key

Q28 TS EAPCET 2026 · 9 May · Shift 1 MCQ

The emissivities of the surfaces of two spheres P and Q of radii 2R and 3R are 0.35 and 0.7 respectively. The ratio of the powers radiated by the spheres P and Q is 9:8. If the wavelength at which sphere P emits radiations of maximum intensity is 4000 Å, then the wavelength at which sphere Q emits radiations of maximum intensity is

(A) 5000 Å
(B) 3000 Å
(C) 4500 Å
(D) 6000 Å

Answer: (D) 6000 Å · The council's preliminary key

Q29 TS EAPCET 2026 · 9 May · Shift 2 MCQ

Water of mass 3 kg in a kettle of mass 1 kg at an initial temperature of 30 °C is heated by a heater of power 2 kW. When the lid of the kettle is open, heat is lost at a constant rate of 250 $\mathrm{J\,s^{-1}}$. If the specific heat capacity of the material of the kettle is half of the specific heat capacity of water, then the time required in minutes to increase the temperature of the water to 80 °C with the lid of the kettle open is

(Specific heat capacity of water = 4200 $\mathrm{J\,kg^{-1}\,K^{-1}}$)

(A) 13
(B) 7
(C) 9
(D) 21

Answer: (B) 7 · The council's preliminary key

Q30 TS EAPCET 2026 · 9 May · Shift 2 MCQ

Two spherical black bodies A and B of equal radii are at absolute temperatures 2T and 3T respectively. If the absolute temperature of the surroundings is T, then the ratio of the radiant powers emitted by the bodies A and B is

(A) $3:16$
(B) $3:8$
(C) $1:2$
(D) $2:3$

Answer: (A) $3:16$ · The council's preliminary key

Q31 AP EAPCET 2025 · 27 May · Shift 1 MCQ

A rectangular slab consists of two cubes of copper and brass of equal sides having thermal conductivities in the ratio $4:1$. If the free face of brass is at $0\ ^{\circ}\mathrm{C}$ and that of copper is at $100\ ^{\circ}\mathrm{C}$, then

the temperature of their interface is

(A) $80\ ^\circ\mathrm{C}$
(B) $20\ ^\circ\mathrm{C}$
(C) $60\ ^\circ\mathrm{C}$
(D) $40\ ^\circ\mathrm{C}$

Answer: (A) $80\ ^\circ\mathrm{C}$ · The council's preliminary key

Q32 AP EAPCET 2025 · 26 May · Shift 1 MCQ

If some heat is given to a metal of mass 100 g, its temperature rises by 20 °C. If the same heat is given to 20 g of water, the change in its temperature (in °C) is (The ratio of specific heat capacities of metal and water is 1 : 10)

(A) 5
(B) 10
(C) 12
(D) 15

Answer: (B) 10 · The council's preliminary key

Q33 AP EAPCET 2025 · 26 May · Shift 2 MCQ

If a body cools from a temperature of $62\ ^\circ\mathrm{C}$ to $50\ ^\circ\mathrm{C}$ in 10 minutes and to $42\ ^\circ\mathrm{C}$ in the next 10 minutes, then the temperature of the surroundings is

(A) $12\ ^\circ\mathrm{C}$
(B) $26\ ^\circ\mathrm{C}$
(C) $36\ ^\circ\mathrm{C}$
(D) $21\ ^\circ\mathrm{C}$

Answer: (B) $26\ ^\circ\mathrm{C}$ · The council's preliminary key

Q34 AP EAPCET 2025 · 24 May · Shift 1 MCQ

A wire of length 0.5 m and area of cross-section $4 \times 10^{-6}\ \mathrm{m}^2$ at a temperature of 100°C is suspended vertically by fixing its upper end to the ceiling. The wire is then cooled to 0 °C, but is prevented from contracting, by attaching a mass at the lower end. If the mass of the wire is negligible, then the value of the mass attached to the wire is
[Young's modulus of material of the wire = $10^{11}\ \mathrm{N\,m^{-2}}$; coefficient of linear expansion of the material of the wire = $10^{-5}\ \mathrm{K^{-1}}$ and acceleration due to gravity = $10\ \mathrm{m\,s^{-2}}$]

(A) 10 kg
(B) 20 kg
(C) 30 kg
(D) 40 kg

Answer: (D) 40 kg · The council's preliminary key

Q35 AP EAPCET 2025 · 24 May · Shift 1 MCQ

The temperature of water of mass $100\ \text{g}$ is rasied from $24\ ^\circ\text{C}$ to $90\ ^\circ\text{C}$ by adding steam to it. The mass of the steam added is
(Latent heat of steam $= 540\ \text{cal g}^{-1}$ and specific heat capacity of water $= 1\ \text{cal g}^{-1}\ ^\circ\text{C}^{-1}$)

(A) $10\ \text{g}$
(B) $12\ \text{g}$
(C) $8\ \text{g}$
(D) $16\ \text{g}$

Answer: (B) $12\ \text{g}$ · The council's preliminary key

Q36 AP EAPCET 2025 · 23 May · Shift 1 MCQ

Steam at $100\ ^\circ\text{C}$ is passed into $114\ \text{g}$ of water at $30\ ^\circ\text{C}$. The mass of water present in the mixture when the temperature of the water becomes $70\ ^\circ\text{C}$ is
(Latent heat of steam $= 540\ \text{cal g}^{-1}$; specific heat capacity of water $= 1\ \text{cal g}^{-1}\ ^\circ\text{C}^{-1}$)

(A) $122\ \text{g}$
(B) $132\ \text{g}$
(C) $142\ \text{g}$
(D) $152\ \text{g}$

Answer: (A) $122\ \text{g}$ · The council's preliminary key

Q37 AP EAPCET 2025 · 23 May · Shift 2 MCQ

A small quantity of water of mass 'm' at temperature θ °C is mixed with a large mass 'M' of ice which is at its melting point. If 's' is specific heat capacity of water and 'L' is the Latent heat of fusion of ice, then the mass of ice melted is

(A) $\frac{ML}{ms\theta}$
(B) $\frac{ms\theta}{ML}$
(C) $\frac{Ms\theta}{L}$
(D) $\frac{ms\theta}{L}$

Answer: (D) $\frac{ms\theta}{L}$ · The council's preliminary key

Q38 AP EAPCET 2025 · 22 May · Shift 1 MCQ

If the values of the temperature of a body in Fahrenheit and Celcius scales are in the ratio of $13:5$, then the temperature of the body is

(A) $80\ ^0\mathrm{F}$
(B) $104\ ^0\mathrm{C}$
(C) $40\ ^0\mathrm{C}$
(D) $40\ ^0\mathrm{F}$

Answer: (C) $40\ ^0\mathrm{C}$ · The council's preliminary key

Q39 AP EAPCET 2025 · 22 May · Shift 2 MCQ

If the wavelengths of maximum intensity of radiation emitted by two black bodies A and B are $0.5\ \mu\mathrm{m}$ and $0.1\ \mathrm{mm}$ respectively, then ratio of the temperatures of the bodies A and B is

(A) 5
(B) 25
(C) 100
(D) 200

Answer: (D) 200 · The council's preliminary key

Q40 TS EAPCET 2025 · 4 May · Shift 1 MCQ

The temperature of a body shown by a faulty Celsius thermometer is $49\ ^\circ\mathrm{C}$ and by a correct Fahrenheit thermometer is $122\ ^\circ\mathrm{F}$. The correction to be applied to the faulty thermometer is

(A) $-12\ ^\circ\mathrm{C}$
(B) $+1\ ^\circ\mathrm{C}$
(C) $+12\ ^\circ\mathrm{C}$
(D) $-1\ ^\circ\mathrm{C}$

Answer: (B) $+1\ ^\circ\mathrm{C}$ · The council's preliminary key

Q41 TS EAPCET 2025 · 4 May · Shift 1 MCQ

If the radiation emitted by a perfect radiator has maximum intensity at a wavelength of 2900 Å, the intensity of radiation emitted by it is

(Stefan-Boltzmann's constant $= 5.67 \times 10^{-8}\ \mathrm{W\,m^{-2}\,K^{-4}}$ and Wein's constant $= 2.9 \times 10^{-3}\ \mathrm{mK}$)

(A) $5.67 \times 10^{8}\ \mathrm{W\,m^{-2}}$
(B) $5.67\ \mathrm{W\,m^{-2}}$
(C) $5670\ \mathrm{W\,m^{-2}}$
(D) $2.9\ \mathrm{W\,m^{-2}}$

Answer: (A) $5.67 \times 10^{8}\ \mathrm{W\,m^{-2}}$ · The council's preliminary key

Q42 TS EAPCET 2025 · 4 May · Shift 2 MCQ

A steel pendulum clock manufactured at $32^{\circ}\mathrm{C}$ and working at $47^{\circ}\mathrm{C}$ is nearly
(Coefficient of linear expansion of steel $= 12 \times 10^{-6}\ /^{\circ}\mathrm{C}$)

(A) 7.8 s slow per day
(B) 7.8 s fast per day
(C) 15.6 s slow per day
(D) 15.6 s fast per day

Answer: (A) 7.8 s slow per day · The council's preliminary key

Q43 TS EAPCET 2025 · 4 May · Shift 2 MCQ

A metal metre scale that is accurate up to 0.5 mm is made at a temperature of $25^{\circ}\mathrm{C}$. The range of temperatures within which it can be used is (Coefficient of linear expansion of the metal $= 10^{-5}\ /^{\circ}\mathrm{C}$)

(A) $+25^{\circ}\mathrm{C}$ to $+75^{\circ}\mathrm{C}$
(B) $+25^{\circ}\mathrm{C}$ to $+50^{\circ}\mathrm{C}$
(C) $-25^{\circ}\mathrm{C}$ to $+75^{\circ}\mathrm{C}$
(D) $0^{\circ}\mathrm{C}$ to $+50^{\circ}\mathrm{C}$

Answer: (C) $-25^{\circ}\mathrm{C}$ to $+75^{\circ}\mathrm{C}$ · The council's preliminary key

Q44 TS EAPCET 2025 · 3 May · Shift 1 MCQ

To increase the length of a metal rod by 0.4%, the temperature of the rod is to be increased by
(Coefficient of linear expansion of the metal $= 20 \times 10^{-6}\ ^{\circ}\mathrm{C}^{-1}$)

(A) 373 K
(B) 473 K
(C) 200 K
(D) 100 K

Answer: (C) 200 K · The council's preliminary key

Q45 TS EAPCET 2025 · 3 May · Shift 2 MCQ

The temperature at which the reading on Fahrenheit scale becomes 90% more than the reading on Celsius scale is

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(A) $280\ ^\circ\mathrm{F}$
(B) $580\ ^\circ\mathrm{F}$
(C) $608\ ^\circ\mathrm{F}$
(D) $320\ ^\circ\mathrm{F}$

Answer: (C) $608\ ^\circ\mathrm{F}$ · The council's preliminary key

Q46 TS EAPCET 2025 · 3 May · Shift 2 MCQ

A rectangular ice box of total surface area of 1000 cm^2 initially contains 1.5 kg of ice at 0 °C. If the thickness of the walls of the box is 2 mm and the temperature outside the box is 42 °C, then the mass of the ice remaining in the box after 160 minutes is (Thermal conductivity of the material of the box $= 10^{-2}\ \mathrm{Wm^{-1}K^{-1}}$ and latent heat of the fusion of ice $= 336 \times 10^3\ \mathrm{Jkg^{-1}}$)

(A) 0.6 kg
(B) 0.9 kg
(C) 0.8 kg
(D) 0.7 kg

Answer: (B) 0.9 kg · The council's preliminary key

Q47 TS EAPCET 2025 · 2 May · Shift 1 MCQ

The length of a metal rod is 20 cm and its area of cross-section is $4\ \mathrm{cm}^2$. If one end of the rod is kept at a temperature of $100\ ^\circ\mathrm{C}$ and the other end is kept in ice at $0\ ^\circ\mathrm{C}$, then the mass of the ice melted in 7 minutes is

(Thermal conductivity of the metal $= 90\ \mathrm{Wm^{-1}K^{-1}}$ and

latent heat of fusion of ice $= 336 \times 10^3\ \mathrm{J\,kg^{-1}}$)

(A) 90 g
(B) 67.5 g
(C) 22.5 g
(D) 45 g

Answer: (C) 22.5 g · The council's preliminary key

Q48 TS EAPCET 2025 · 2 May · Shift 1 MCQ

The heat required to convert 8 g of ice at a temperature of $-20\ ^\circ\mathrm{C}$ to steam at $100\ ^\circ\mathrm{C}$ is [Specific heat capacity of ice $= 2100\ \mathrm{J\,kg^{-1}\,K^{-1}}$, specific heat capacity of water $= 4200\ \mathrm{J\,kg^{-1}\,K^{-1}}$, latent heat of fusion of ice $= 336 \times 10^3\ \mathrm{J\,kg^{-1}}$ and latent heat of steam $= 2.268 \times 10^6\ \mathrm{J\,kg^{-1}}$]

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(A) 5400 cal
(B) 5840 cal
(C) 5760 cal
(D) 5120 cal

Answer: (B) 5840 cal · The council's preliminary key

Q49 TS EAPCET 2025 · 2 May · Shift 2 MCQ

A body cools from a temperature of 60 °C to 50 °C in 10 minutes and 50 °C to 40 °C in 15 minutes. The time taken in minutes for the body to cool from 40 °C to 30 °C is

(A) 30
(B) 20
(C) 25
(D) 40

Answer: (A) 30 · The council's preliminary key

Q50 AP EAPCET 2024 · 22 May · Shift 1 MCQ

A metal ball of mass $100\ \mathrm{g}$ at $20\ ^{\circ}\mathrm{C}$ is dropped in $200\ \mathrm{ml}$ of water at $80^{\circ}\mathrm{C}$. If the resultant temperature is $70\ ^{\circ}\mathrm{C}$, then the ratio of specific heat of the metal to that of water is

(A) $5/2$
(B) $1/2$
(C) $2/5$
(D) $2/1$

Answer: (C) $2/5$ · The council's preliminary key

Q51 AP EAPCET 2024 · 22 May · Shift 2 MCQ

Water of mass m at $30\ ^{\circ}\mathrm{C}$ is mixed with $5\ \mathrm{g}$ of ice at $-20\ ^{\circ}\mathrm{C}$. If the resultant temperature of the mixture is $6\ ^{\circ}\mathrm{C}$, then the value of m is (specific heat capacity of ice $= 0.5\ \mathrm{cal\,g^{-1}\,^{\circ}C^{-1}}$, specific heat capacity of water $= 1\ \mathrm{cal\,g^{-1}\,^{\circ}C^{-1}}$ and latent heat of fusion of ice $= 80\ \mathrm{cal\,g^{-1}}$)

(A) $48\ \mathrm{g}$
(B) $20\ \mathrm{g}$
(C) $24\ \mathrm{g}$
(D) $40\ \mathrm{g}$

Answer: (B) $20\ \mathrm{g}$ · The council's preliminary key

Q52 AP EAPCET 2024 · 21 May · Shift 1 MCQ

A slab consists of two identical plates of copper and brass. The free face of the brass is at $0\ ^{\circ}\mathrm{C}$ and that of copper at $100\ ^{\circ}\mathrm{C}$. If the thermal conductivities of brass and copper are in the ratio 1:4, then

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the temperature of interface is

(A) 20° C
(B) 40° C
(C) 60° C
(D) 80° C

Answer: (D) 80° C · The council's preliminary key

Q53 AP EAPCET 2024 · 21 May · Shift 2 MCQ

A metal block is made from a mixture of 2.4 kg of aluminium, 1.6 kg of brass and 0.8 kg of copper. The metal block is initially at 20° c. If the heat supplied to the metal block is 44.4 calories, find the final temperature of the block if specific heats of aluminium, brass and copper are $0.216, 0.0917, 0.0931$ cal. $\mathrm{kg}^{-1}\,^\circ\mathrm{C}^{-1}$ respectively.

(A) $100\,^\circ$C
(B) $60\,^\circ$C
(C) $40\,^\circ$C
(D) $80\,^\circ$C

Answer: (D) $80\,^\circ$C · The council's preliminary key

Q54 AP EAPCET 2024 · 20 May · Shift 1 MCQ

The temperature difference across two cylindrical rods A and B of same material and same mass are $40\,^\circ$C and $60\,^\circ$C respectively. In steady state, if the rates of flow of heat through the rods A and B are in the ratio $3:8$, the ratio of the lengths of the rods A and B is

(A) $1:3$
(B) $5:3$
(C) $4:3$
(D) $2:3$

Answer: (C) $4:3$ · The council's preliminary key

Q55 AP EAPCET 2024 · 20 May · Shift 2 MCQ

The absorption coefficient value of a perfect black body is

(A) zero
(B) < 1
(C) > 1
(D) 1

Answer: (D) 1 · The council's preliminary key

Q56 AP EAPCET 2024 · 19 May · Shift 2 MCQ

If ambient temperature is 300 K, the rate of cooling at 600 K is H. In the same surroundings, the rate of cooling at 900 K is

(A) $\frac{16}{3}$ H
(B) 2 H
(C) 3 H
(D) $\frac{2}{3}$ H

Answer: (A) $\frac{16}{3}$ H · The council's preliminary key

Q57 AP EAPCET 2024 · 18 May · Shift 1 MCQ

The length of a metal bar is 20 cm and the area of cross section is $4 \times 10^{-4} \mathrm{m}^2$. If one end of the rod is kept in ice at $0^{\circ}\mathrm{C}$ and the other end is kept in steam at $100^{\circ}\mathrm{C}$, the mass of ice melted in one minute is 5 g. The thermal conductivity of the metal in $\mathrm{Wm}^{-1}\mathrm{K}^{-1}$ is

(Latent heat of fusion = 80 cal/gm)

(A) 140
(B) 120
(C) 100
(D) 160

Answer: (A) 140 · The council's preliminary key

Q58 TS EAPCET 2024 · 11 May · Shift 1 MCQ

A pendulum clock loses 10.8 seconds a day when the temperature is $38^{\circ}\mathrm{C}$ and gains 10.8 seconds a day when the temperature is $18^{\circ}\mathrm{C}$. The coefficient of linear expansion of the metal of the pendulum clock is

(A) $7 \times 10^{-5}{}^{\circ}\mathrm{C}^{-1}$
(B) $1.25 \times 10^{-5}{}^{\circ}\mathrm{C}^{-1}$
(C) $5 \times 10^{-5}{}^{\circ}\mathrm{C}^{-1}$
(D) $2.5 \times 10^{-5}{}^{\circ}\mathrm{C}^{-1}$

Answer: (D) $2.5 \times 10^{-5}{}^{\circ}\mathrm{C}^{-1}$ · The council's preliminary key

Q59 TS EAPCET 2024 · 11 May · Shift 1 MCQ

A liquid cools from a temperature of 368 K to 358 K in 22 minutes. In the same room, the same liquid takes 12.5 minutes to cool from 358 K to 353 K. The room temperature is

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(A) $27.5^{\circ}\mathrm{C}$
(B) $27.5\ \mathrm{K}$
(C) $30.5^{\circ}\mathrm{C}$
(D) $30.5\ \mathrm{K}$

Answer: (A) $27.5^{\circ}\mathrm{C}$ · The council's preliminary key

Q60 TS EAPCET 2024 · 10 May · Shift 1 MCQ

37 g of ice at $0\,^{\circ}\mathrm{C}$ temperature is mixed with 74 g of water at $70\,^{\circ}\mathrm{C}$ temperature. The resultant temperature is
(Specific heat capacity of water $= 1\ \mathrm{cal\ g^{-1}\ ^{\circ}C^{-1}}$ and latent heat of fusion of ice $= 80\ \mathrm{cal\ g^{-1}}$)

(A) $45^{\circ}\mathrm{C}$
(B) $70^{\circ}\mathrm{C}$
(C) $20^{\circ}\mathrm{C}$
(D) $35^{\circ}\mathrm{C}$

Answer: (C) $20^{\circ}\mathrm{C}$ · The council's preliminary key

Q61 TS EAPCET 2024 · 10 May · Shift 1 MCQ

The thickness of a uniform rectangular metal plate is 5 mm and the area of each surface is $5\ \mathrm{cm^2}$. In steady state, the temperature difference between the two surfaces of the plate is $14\,^{\circ}\mathrm{C}$. If the heat flowing through the plate in one second from one surface to the other surface is 42 J, then the thermal conductivity of the metal is

(A) $90\ \mathrm{Wm^{-1}K^{-1}}$
(B) $30\ \mathrm{Wm^{-1}K^{-1}}$
(C) $45\ \mathrm{Wm^{-1}K^{-1}}$
(D) $60\ \mathrm{Wm^{-1}K^{-1}}$

Answer: (B) $30\ \mathrm{Wm^{-1}K^{-1}}$ · The council's preliminary key

Q62 TS EAPCET 2024 · 10 May · Shift 2 MCQ

Steam of mass 60 g at a temperature $100\,^{\circ}\mathrm{C}$ is mixed with water of mass 360 g at a temperature $40\,^{\circ}\mathrm{C}$. The ratio of the masses of steam and water in equilibrium is
(Latent heat of steam is $540\ \mathrm{cal\ g^{-1}}$ and specific heat capacity of water is $1\ \mathrm{cal\ g^{-1}\ ^{\circ}C^{-1}}$)

(A) $1:20$
(B) $1:10$
(C) $1:5$
(D) $1:3$

Answer: (A) $1:20$ · The council's preliminary key

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Q63 TS EAPCET 2024 · 10 May · Shift 2 MCQ

The temperature difference between the ends of two cylindrical rods A and B of the same material is $2:3$. In steady state the ratio of the rates of flow of heat through the rods A and B is $5:9$. If the radii of the rods A and B are in the ratio $1:2$, then the ratio of lengths of the rods A and B is

(A) $2:7$
(B) $3:7$
(C) $2:5$
(D) $3:10$

Answer: (D) $3:10$ · The council's preliminary key

Q64 TS EAPCET 2024 · 9 May · Shift 1 MCQ

The temperature on a Fahrenheit temperature scale that is twice the temperature on a Celsius temperature scale is

(A) $160\ ^\circ\mathrm{F}$
(B) $240\ ^\circ\mathrm{F}$
(C) $320\ ^\circ\mathrm{F}$
(D) $480\ ^\circ\mathrm{F}$

Answer: (C) $320\ ^\circ\mathrm{F}$ · The council's preliminary key

Q65 TS EAPCET 2024 · 9 May · Shift 1 MCQ

The temperatures of equal masses of three different liquids A, B and C are 15 °C, 24 °C and 30 °C respectively. The resultant temperature when liquids A and B are mixed is 20 °C and when liquids B and C are mixed is 26 °C. Then the ratio of specific heat capacities of the liquids A, B and C is

(A) $5:8:10$
(B) $8:10:5$
(C) $5:10:8$
(D) $8:5:10$

Answer: (B) $8:10:5$ · The council's preliminary key

Q66 TS EAPCET 2024 · 9 May · Shift 2 MCQ

When 54 g of ice at $-20\ ^\circ\mathrm{C}$ is mixed with 25 g of steam at $100\ ^\circ\mathrm{C}$, then the final mixture at thermal equilibrium contains

(A) 20 g water at $100\,^{\circ}\mathrm{C}$
(B) 73 g water at $100\,^{\circ}\mathrm{C}$ and 6 g steam at $100\,^{\circ}\mathrm{C}$
(C) 8 g steam at $100\,^{\circ}\mathrm{C}$ and 12 g water at $0\,^{\circ}\mathrm{C}$
(D) 20 g water at $50\,^{\circ}\mathrm{C}$

Answer: (B) 73 g water at $100\,^{\circ}\mathrm{C}$ and 6 g steam at $100\,^{\circ}\mathrm{C}$ · The council's preliminary key

Q67 TS EAPCET 2024 · 9 May · Shift 2 MCQ

A solid sphere at a temperature T K is cut in to two hemispheres. The ratio of energies radiated by one hemisphere to the whole sphere per second is

(A) $1:1$
(B) $1:2$
(C) $3:4$
(D) $1:4$

Answer: (C) $3:4$ · The council's preliminary key

Q68 AP EAPCET 2023 · 19 May · Shift 1 MCQ

The temperature of the earth without green house effect will be

(A) 0 °C
(B) -18 °C
(C) -10 °C
(D) -24 °C

Answer: (B) -18 °C · The council's preliminary key

Q69 AP EAPCET 2023 · 18 May · Shift 1 MCQ

The heat energy released by water of mass 2 kg when it is cooled by 10 °C is

(Specific heat capacity of water = 4200 J kg^{-1} K^{-1})

(A) 42000 J
(B) 21000 J
(C) 63000 J
(D) 84000 J

Answer: (D) 84000 J · The council's preliminary key

Q70 AP EAPCET 2023 · 18 May · Shift 1 MCQ

When an iron rod is heated, the variation of colour from dull red to white can be explained by

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(A) Boltzmann Law
(B) Newton's Law of cooling
(C) Stefan's Law of radiation
(D) Wien's displacement Law

Answer: (D) Wien's displacement Law · The council's preliminary key

Q71 AP EAPCET 2023 · 18 May · Shift 2 MCQ

A 50 g ice cube at -10 °C is added to 200 g of water at 30 °C. The final temperature of the mixture is (specific heat of water $= 1\ \text{cal g}^{-1}\ ^\circ\text{C}^{-1}$, latent heat of fusion of ice $= 80\ \text{cal g}^{-1}$, specific heat of ice $= 0.5\ \text{cal g}^{-1}\ ^\circ\text{C}^{-1}$)

(A) 20 °C
(B) 7 °C
(C) 12 °C
(D) 10 °C

Answer: (B) 7 °C · The council's preliminary key

Q72 AP EAPCET 2023 · 17 May · Shift 1 MCQ

The phenomena of lowering freezing point of water by the application of pressure is known as

(A) Sublimation
(B) Regelation
(C) Precipitation
(D) Crystallization

Answer: (B) Regelation · The council's preliminary key

Q73 AP EAPCET 2023 · 17 May · Shift 1 MCQ

A steel ball of mass 200 g falls freely from a height of 20 m and bounces to a height of 10.8 m from the ground. If the energy lost in this process is absorbed by the ball, the rise in its temperature is ($g = 10\ \text{ms}^{-2}$, specific heat capacity of steel is $460\ \text{Jkg}^{-1}\text{K}^{-1}$)

(A) $0.1\ ^\circ\text{C}$
(B) $1\ ^\circ\text{C}$
(C) $0.2\ ^\circ\text{C}$
(D) $2\ ^\circ\text{C}$

Answer: (C) $0.2\ ^\circ\text{C}$ · The council's preliminary key

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Q74 AP EAPCET 2023 · 17 May · Shift 2 MCQ

A steel tape of 300 cm length is graduated at 27 °C. The length of a steel rod measured using the tape is found to be 110 cm at 50 °C. The actual length of steel rod at 50 °C is

$(\alpha_{\text{steel}} = 1.2 \times 10^{-5}\ \text{K}^{-1})$

(A) 110.03 cm
(B) 110.10 cm
(C) 110.07 cm
(D) 110.62 cm

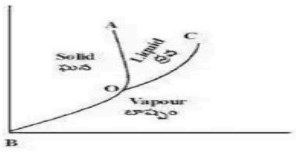
Answer: (A) 110.03 cm · The council's preliminary key

Q75 AP EAPCET 2023 · 16 May · Shift 1 MCQ

In the given triple point curve as shown in fig. the curves AO, BO, CO represents

(see the figure above)

In the given triple point curve as shown in fig. the curves AO, BO, CO represents
ఇచ్చిన పటంలోని త్రిక బిందు వక్రంలో AO, BO, CO వక్రములు సూచించేవి



Options :

1. AO = Sublimation curve, BO = fusion curve, CO = Vaporization curve
   AO = ఉత్పాతన వక్రం, BO = ఘనీభవన వక్రం, CO = బాష్పీభవన వక్రం
2. AO = Fusion curve, BO = Sublimation curve, CO = Vaporization curve
   AO = ఘనీభవన వక్రం, BO = ఉత్పాతన వక్రం, CO = బాష్పీభవన వక్రం
3. AO = Fusion curve, BO = Vaporization curve, CO = Sublimation curve
   AO = ఘనీభవన వక్రం, BO = బాష్పీభవన వక్రం, CO = ఉత్పాతన వక్రం
4. AO = Vaporization curve, BO = fusion curve, CO = Sublimation curve
   AO = బాష్పీభవన వక్రం, BO = ఘనీభవన వక్రం, CO = ఉత్పాతన వక్రం

(A) AO = Sublimation curve, BO = fusion curve, CO = Vaporization curve
(B) AO = Fusion curve, BO = Sublimation curve, CO = Vaporization curve
(C) AO = Fusion curve, BO = Vaporization curve, CO = Sublimation curve
(D) AO = Vaporization curve, BO = fusion curve, CO = Sublimation curve

Answer: (B) AO = Fusion curve, BO = Sublimation curve, CO = Vaporization curve · The council's preliminary key

Q76 AP EAPCET 2023 · 16 May · Shift 2 MCQ

A rod is found to be 0.05 cm longer at $40\ ^\circ\text{C}$ than it is at $10\ ^\circ\text{C}$. The length of the rod at $0\ ^\circ\text{C}$ is

(coefficient of linear expansion of the material of the rod = $1.5 \times 10^{-5}\ ^{\circ}\mathrm{C}^{-1}$)

(A) 101.1 cm
(B) 120.2 cm
(C) 105.1 cm
(D) 111.1 cm

Answer: (D) 111.1 cm · The council's preliminary key

Q77 AP EAPCET 2023 · 15 May · Shift 1 MCQ

The specific heat capacity of a copper block of mass M is 's'. If the mass of the copper block is doubled, the specific heat capacity will be

(A) $2s$
(B) $\frac{s}{2}$
(C) s
(D) $\sqrt{\frac{3}{2}}\,s$

Answer: (C) s · The council's preliminary key

Q78 AP EAPCET 2023 · 15 May · Shift 2 MCQ

The emissivity of a perfect black body is increased to 16 times by increasing its temperature. If the initial temperature is T, then final temperature of that black body is

(A) 4 T
(B) 8 T
(C) 2 T
(D) 16 T

Answer: (C) 2 T · The council's preliminary key

Q79 TS EAMCET 2023 · 14 May · Shift 1 MCQ

The Fahrenheit and Kelvin scales of temperature will have the same reading at a temperature of

(A) $-40\,^{\circ}\mathrm{F}$
(B) $313\,^{\circ}\mathrm{F}$
(C) $574.6\,^{\circ}\mathrm{F}$
(D) $732.7\,^{\circ}\mathrm{F}$

Answer: (C) $574.6\,^{\circ}\mathrm{F}$ · The council's preliminary key

Q80 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If the ratio of densities of two substances is 5:6 and the ratio of their specific heat capacities is 3:5, then the ratio of heat energies required per unit volume so that the two substances can have same

temperature rise is

(A) 1:1
(B) 1:4
(C) 1:2
(D) 1:3

Answer: (C) 1:2 · The council's preliminary key

Q81 TS EAMCET 2023 · 14 May · Shift 2 MCQ

Steam at $100\,^{\circ}\mathrm{C}$ is added to 150 g water to increase its temperature from $20\,^{\circ}\mathrm{C}$ to $40\,^{\circ}\mathrm{C}$.

The total mass of the water at $40\,^{\circ}\mathrm{C}$ is

(specific heat capacity of water $= 1$ cal $\mathrm{g}^{-1}\,^{\circ}\mathrm{C}^{-1}$ and latent heat of steam $= 540$ cal g^{-1})

(A) 155 g
(B) 150 g
(C) 145 g
(D) 5 g

Answer: (A) 155 g · The council's preliminary key

Q82 TS EAMCET 2023 · 14 May · Shift 2 MCQ

A blacksmith fixes circular iron frame on the wooden wheel of a bullock cart. The diameter of wooden wheel and circular iron frame are 5.012 m and 5 m respectively at 27 °C. The temperature (in °C) to which the iron ring must be heated so as to fit the wooden wheel is (Coefficient of linear expansion of iron = $1.2 \times 10^{-5}\ ^{\circ}\mathrm{C}^{-1}$)

(A) 200
(B) 227
(C) 254
(D) 300

Answer: (B) 227 · The council's preliminary key

Q83 TS EAMCET 2023 · 13 May · Shift 1 MCQ

For an ideal gas at a temperature of $27\,^{\circ}\mathrm{C}$ and at constant pressure, the coefficient of volume expansion is nearly

(A) $33 \times 10^{-5}\ \mathrm{K}^{-1}$
(B) $22 \times 10^{-4}\ \mathrm{K}^{-1}$
(C) $37 \times 10^{-5}\ \mathrm{K}^{-1}$
(D) $33 \times 10^{-4}\ \mathrm{K}^{-1}$

Answer: (D) $33 \times 10^{-4}\ \mathrm{K}^{-1}$ · The council's preliminary key

Q84 TS EAMCET 2023 · 13 May · Shift 1 MCQ

The temperature of 100 g of water is to be raised from $24\,^{\circ}\mathrm{C}$ to $90\,^{\circ}\mathrm{C}$ by adding steam at $100\,^{\circ}\mathrm{C}$ to it. The mass of the steam required in this process is
(latent heat of steam is $540\ \mathrm{cal\,g^{-1}}$)

(A) $2\ \mathrm{g}$
(B) $4\ \mathrm{g}$
(C) $10\ \mathrm{g}$
(D) $12\ \mathrm{g}$

Answer: (D) $12\ \mathrm{g}$ · The council's preliminary key

Q85 TS EAMCET 2023 · 13 May · Shift 2 MCQ

The length of a metal rod at $30\ ^{\circ}\mathrm{C}$ is 30 cm. If its temperature is raised to $105\ ^{\circ}\mathrm{C}$, its length is increased by 0.027 cm. Then the coefficient of linear expansion of the metal is

(A) $12 \times 10^{-4}/^{\circ}\mathrm{C}$
(B) $12 \times 10^{-5}/^{\circ}\mathrm{C}$
(C) $12 \times 10^{-6}/^{\circ}\mathrm{C}$
(D) $12 \times 10^{-7}/^{\circ}\mathrm{C}$

Answer: (C) $12 \times 10^{-6}/^{\circ}\mathrm{C}$ · The council's preliminary key

Q86 TS EAMCET 2023 · 13 May · Shift 2 MCQ

The heat energy required to convert 10 kg of ice at -10 °C into water at 0 °C is
(specific heat capacity of ice = 0.5 cal g^{-1} and latent heat of fusion of ice = 80 cal g^{-1})

(A) 357×10^{4} J
(B) 357×10^{3} J
(C) 357×10^{2} J
(D) 357×10^{5} J

Answer: (A) 357×10^{4} J · The council's preliminary key

Q87 TS EAMCET 2023 · 13 May · Shift 2 MCQ

If the reading in Fahrenheit scale is twice the reading in Celsius scale, then the reading in Fahrenheit scale is

(A) $100\ ^\circ\mathrm{F}$
(B) $120\ ^\circ\mathrm{F}$
(C) $80\ ^\circ\mathrm{F}$
(D) $320\ ^\circ\mathrm{F}$

Answer: (D) $320\ ^\circ\mathrm{F}$ · The council's preliminary key

Q88 TS EAMCET 2023 · 12 May · Shift 1 MCQ

Two objects made of the same material have masses 'm' and '2m' and are at temperatures '2T' and 'T' respectively. When heat 'Q' is supplied to the object of mass '2m', its temperature raises to '2T'. If the same heat is supplied to the object of mass 'm', its temperature raises to

(A) $2T$
(B) $\frac{3T}{2}$
(C) $4T$
(D) $3T$

Answer: (C) $4T$ · The council's preliminary key

Q89 TS EAMCET 2023 · 12 May · Shift 1 MCQ

On a new temperature scale, the melting point of ice is 20 °X and the boiling point of water is 110 °X. A temperature of 40 °C would be indicated on this new temperature scale as

(A) 60 °X
(B) 56 °X
(C) 70 °X
(D) 54 °X

Answer: (B) 56 °X · The council's preliminary key

Q90 TS EAMCET 2023 · 12 May · Shift 2 MCQ

Two rods of same area of cross-section have lengths L and 2L and coefficients of linear expansions 2α and α respectively. If they are welded to form a composite rod of length 3L then the coefficient of linear expansion of the composite rod is

(A) $\frac{3\alpha}{2}$
(B) 3α
(C) $\frac{3\alpha}{4}$
(D) $\frac{4\alpha}{3}$

Answer: (D) $\frac{4\alpha}{3}$ · The council's preliminary key

Q91 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

Two metal rods A and B each of length 50 cm and diameter 4.0 mm are joined together at temperature 30 °C. What is the change in length of the combined rod at 230 °C ? [Given linear expansion coefficients of rods A and B are respectively, $2.0 \times 10^{-5}/°C$ and $1.0 \times 10^{-5}/°C$]

(A) 4 mm
(B) 2 mm
(C) 3 mm
(D) 1 mm

Answer: (C) 3 mm · The council's preliminary key

Q92 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

Find the difference in temperature between the water at the top and the bottom of 20 m high waterfall assuming 10 % of the energy of fall is spent in heating the water [Use specific heat capacity of water = 4000 J kg^{-1} k^{-1} and g = 10 m/s^2]

(A) 0.002 °C
(B) 0.004 °C
(C) 0.005 °C
(D) 0.006 °C

Answer: (C) 0.005 °C · The council's preliminary key

Q93 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

A circular copper ring at 30 °C has a hole with an area of $9.98\ cm^2$. It is made to slip onto a steel rod of cross-sectional area of $10\ cm^2$, by raising the temperature of both ring and rod simultaneously by an amount ΔT. If the coefficient of linear expansion of copper and steel are $17 \times 10^{-6}/°C$ and $11 \times 10^{-6}/°C$, then minimum value of ΔT should be

(A) 6 ° C
(B) 3 ° C
(C) 3 ° C
(D) 9 ° C

Answer: (A)

1. 6 °C

· The council's preliminary key

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Q94 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

Statement I : A device in which heat measurement can be made is called calorimeter.
Statement II : Skating is possible on snow due to the formation of water below the skates. Water is formed due to the increase of temperature and ice melts.
Statement III: Two bodies at different temperature are mixed in a calorimeter. Total internal energy of the two bodies remains conserved.
Which of the following is correct?

(A) Statements I, II and III are true
(B) Statements I is true, but statements II and III are false
(C) Both statements I and II are true, but statement III is false
(D) Both statements I, III are true, but statement II is false

Answer: (D) Both statements I, III are true, but statement II is false · The council's preliminary key

Q95 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

Which of the following statements is NOT true ?

(A) Specific heat capacity is dependent on nature of substance but independent of its quantity
(B) Specific heat capacity depends on temperature
(C) Specific heat capacity of water doesn't vary with temperature
(D) The SI unit of specific heat capacity is $\mathrm{JK^{-1}kg^{-1}}$

Answer: (C) Specific heat capacity of water doesn't vary with temperature · The council's preliminary key

Q96 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

A piece of metal has a weight of 49 gm in air and 39 gm in a liquid of density 1.2×10^3 kg/m^3 kept at 32 °C. When the temperature of the liquid is raised to 42 °C the metal piece has a weight of 40 gm. If the density of the liquid at 42 °C is 1.0×10^3 kg/m^3, then the coefficient of linear expansion of the metal is

(A) $\frac{8}{3} \times 10^{-3}/^{\circ}\mathrm{C}$
(B) $\frac{11}{3} \times 10^{-3}/^{\circ}\mathrm{C}$
(C) $\frac{1}{3} \times 10^{-4}/^{\circ}\mathrm{C}$
(D) $\frac{4}{3} \times 10^{-3}/^{\circ}\mathrm{C}$

Answer: (A) $\frac{8}{3} \times 10^{-3}/^{\circ}\mathrm{C}$ · The council's preliminary key

Q97 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

A metal cooking pot has a base area of 0.2 m^2 and thickness 2.0 cm. It boils water at a rate of 3.0 kg/min when placed on a hot plate. The temperature of the part of the hot plate in contact with the

pot is approximately
[Thermal conductivity of metal is 120 $Js^{-1}m^{-1}K^{-1}$, heat of vaporisation of water is 2×10^6 J / kg]

(A) $246\ ^\circ C$
(B) $183\ ^\circ C$
(C) $162\ ^\circ C$
(D) $214\ ^\circ C$

Answer: (B) $183\ ^\circ C$ · The council's preliminary key

Q98 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

176 grams of CO_2 can change its temperature from $0^\circ C$ to $30^\circ C$ by absorbing 3600 joules of thermal energy. Molar specific heat of CO_2 in $J.mol^{-1}\ K^{-1}$ is

(A) 30
(B) 40
(C) 50
(D) 60

Answer: (A) 30 · The council's preliminary key

Q99 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

A solution consists of ether and 5.0 g of water at $0\ ^\circ C$. If the ether evaporates completely to freeze the water, then the mass of the ether in the solution is

(A) 5 g
(B) 4 g
(C) 4.5 g
(D) 6 g

Answer: (B) 4 g · The council's preliminary key

Q100 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

Find the ratio of the length of a steel rod and a copper rod if the steel rod is 4 cm longer than the copper rod at any temperature.
[The coefficient of linear expansion for steel and copper are $1.1 \times 10^{-5}/^\circ C$ and $1.7 \times 10^{-5}/^\circ C$ respectively]

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(A) $\frac{17}{11}$
(B) $\frac{11}{17}$
(C) $\frac{11}{4}$
(D) $\frac{17}{4}$

Answer: (A) $\frac{17}{11}$ · The council's preliminary key

Q101 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

An object cools from $100^{\circ}\mathrm{C}$ to $40^{\circ}\mathrm{C}$ in 10 minutes, when the surrounding temperature is $10^{\circ}\mathrm{C}$. Then the time taken by the object to cool from $70^{\circ}\mathrm{C}$ to $20^{\circ}\mathrm{C}$ is
[Take $\ln 2 = 0.7, \ln 3 = 1.1, \ln 6 = 1.8$]

(A) $30\ \mathrm{min}$
(B) $8.5\ \mathrm{min}$
(C) $22.4\ \mathrm{min}$
(D) $16.3\ \mathrm{min}$

Answer: (D) $16.3\ \mathrm{min}$ · The council's preliminary key

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Q102 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

A hole of diameter 5 cm is drilled in a metal sheet at $30^{\circ}\mathrm{C}$. The linear expansion of metal is $2 \times 10^{-5}\ K^{-1}$. The diameter of the hole when the temperature is raised to $230^{\circ}\mathrm{C}$, is equal to

(A) 5.01 cm
(B) 5.02 cm
(C) 5.03 cm
(D) 5.04 cm

Answer: (B) 5.02 cm · The council's preliminary key

Q103 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

A metal cube absorbs 2100.0 J of heat when its temperature is raised by $2\ ^{\circ}\mathrm{C}$. If the specific heat of the metal is 900 J kg^{-1} K^{-1}, then the mass of the cube is

(A) 1.116 kg
(B) 2.33 kg
(C) 1.66 kg
(D) 1.33 kg

Answer: (A) 1.116 kg · The council's preliminary key

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Q104 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

The change in density of mercury, when it is heated from $10\ ^{\circ}\mathrm{C}$ to $60\ ^{\circ}\mathrm{C}$ is
(The coefficient of volume expansion of mercury is $18.2 \times 10^{-5}\ \mathrm{K}^{-1}$)

(A) $1.82\ \%$
(B) 0.91%
(C) $9.1\ \%$
(D) 0.45%

Answer: (B) 0.91% · The council's preliminary key

Q105 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

A small electric heater is used to heat 200 g of water. The time required to bring all this water from $40\ ^{\circ}\mathrm{C}$ to $100\ ^{\circ}\mathrm{C}$ is 200 s. If specific heat of the water is $4200\ \mathrm{J\,kg^{-1}K^{-1}}$ then the power supplied by the heater is

(A) $155\ \mathrm{W}$
(B) $310\ \mathrm{W}$
(C) $88\ \mathrm{W}$
(D) $252\ \mathrm{W}$

Answer: (D) $252\ \mathrm{W}$ · The council's preliminary key

Q106 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

The coefficient of volume expansion of a material is $5 \times 10^{-4}\ ^{\circ}\mathrm{C}^{-1}$. The fractional change in its density for a $40\ ^{0}$C rise in temperature is nearly

(A) 0.01
(B) 0.02
(C) 0.03
(D) 0.04

Answer: (B) 0.02 · The council's preliminary key

Q107 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

Assertion (A): When a uniform metallic rod rotating about perpendicular bisector with constant angular speed is heated uniformly to raise its temperature slightly, its speed of rotation increases.
Reason (R) : When a metal rod is heated uniformly to raise its temperature slightly its moment of inertia increases.

(A) (A) and (R) are true and R is correct explanation of A.
(B) (A) and (R) are true but (R) is not correct explanation of A
(C) (A) is true, but (R) is false
(D) (A) is false but R is true

Answer: (D) (A) is false but R is true · The council's preliminary key

Q108 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

A metal block of mass 3.3 kg is heated to a temperature of $400\ ^\circ\text{C}$ and then block is placed on a large ice block. The specific heat of the metal is $0.4\ \text{J}\,\text{g}^{-1}\,\text{K}^{-1}$ and heat of fusion of water is $330\ \text{J}\,\text{g}^{-1}$. The maximum amount of ice that can melt is

(A) $1.2\ \text{kg}$
(B) $2.2\ \text{kg}$
(C) $1.6\ \text{kg}$
(D) $2\ \text{kg}$

Answer: (C) $1.6\ \text{kg}$ · The council's preliminary key

Q109 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

5 g of ice at $-30\ ^\circ\text{C}$ and 20 g of water at $35\ ^\circ\text{C}$ are mixed together in a calorimeter. The final temperature of the mixture is (Neglect heat capacity of the calorimeter, specific heat capacity of ice $= 0.5\ \text{cal}\,\text{g}^{-1}\,^\circ\text{C}^{-1}$ and latent heat of fusion of ice $= 80\ \text{cal}\,\text{g}^{-1}$ and specific heat capacity of water $= 1\ \text{cal}\,\text{g}^{-1}\,^\circ\text{C}^{-1}$)

(A) $0\ ^\circ\text{C}$
(B) $4\ ^\circ\text{C}$
(C) $5\ ^\circ\text{C}$
(D) $9\ ^\circ\text{C}$

Answer: (D) $9\ ^\circ\text{C}$ · The council's preliminary key

Q110 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

An iron sphere having diameter D and mass M is immersed in hot water so that the temperature of the sphere increases by δT. If α is the coefficient of linear expansion of the iron then the change in the surface area of the sphere is

(A) $\pi D^2.\alpha.\delta T\ (\alpha.\delta T - 4)$
(B) $\pi D^2.\alpha.\delta T\ (\alpha.\delta T + 4)$
(C) $\pi D^2.\alpha.\delta T\ (\alpha.\delta T - 2)$
(D) $\pi D^2.\alpha.\delta T\ (\alpha.\delta T + 2)$

Answer: (D) $\pi D^2.\alpha.\delta T\ (\alpha.\delta T + 2)$ · The council's preliminary key

Q111 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

The amount of heat needed to heat 200 grams of ice at -10°C to convert it into water at 30°C is

Specific heat capacity of ice = $2100\ \mathrm{Jkg^{-1}K^{-1}}$

Specific heat capacity of water = $4186\ \mathrm{Jkg^{-1}K^{-1}}$

Latent heat of fusion of ice = $3.35 \times 10^{5}\ \mathrm{Jkg^{-1}}$

(A) $96316\ \mathrm{J}$
(B) $67000\ \mathrm{J}$
(C) $92116\ \mathrm{J}$
(D) $71200\ \mathrm{J}$

Answer: (A) $96316\ \mathrm{J}$ · The council's preliminary key

Q112 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

A body cools down from 75°C to 65°C in 10 minutes. It will cool down from 65°C to 55°C in a time

(A) 10 minutes
(B) Less than 10 minutes
(C) More than 10 minutes
(D) Less than or more than 10 minutes depending on its mass

Answer: (C) More than 10 minutes · The council's preliminary key

Q113 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

A sphere of surface area 4 $\mathrm{m^2}$ at temperature 400 K and having emissivity 0.5 is located in an environment of temperature 200 K. The net rate of energy exchange of the sphere is
(Stefan Boltzmann constant $\sigma = 5.67 \times 10^{-8}\ \mathrm{Wm^{-2}\,K^{4}}$)

(A) 3260.8 W
(B) 1632.4 W
(C) 2721.6 W
(D) 4216.4 W

Answer: (C) 2721.6 W · The council's preliminary key

Q114 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

A metal tape is calibrated at 25 °C. On a cold day when the temperature is -15 °C, the percentage error in the measurement of length is
(Coefficient of linear expansion of metal = $1 \times 10^{-5}\ ^{\circ}\mathrm{C^{-1}}$)

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(A) $0.04\ \%$
(B) $0.05\ \%$
(C) $0.1\ \%$
(D) $0.08\ \%$

Answer: (A) $0.04\ \%$ · The council's preliminary key

Q115 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

The coefficient of volume expansion is _____

(A) Less than the coefficient of linear expansion
(B) Twice the coefficient of linear expansion
(C) Equal to the coefficient of linear expansion
(D) Thrice the coefficient of linear expansion

Answer: (D) Thrice the coefficient of linear expansion · The council's preliminary key

Q116 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

A beaker is filled completely with water at $4\,^{\circ}\mathrm{C}$. Identify the incorrect statement:

(A) Water overflows when heated above $4\,^{\circ}\mathrm{C}$
(B) Water overflows when cooled below $4\,^{\circ}\mathrm{C}$
(C) Water overflows either when heated above $4\,^{\circ}\mathrm{C}$ or cooled below $4\,^{\circ}\mathrm{C}$
(D) Water will not overflow when cooled below $4\,^{\circ}\mathrm{C}$

Answer: (D) Water will not overflow when cooled below $4\,^{\circ}\mathrm{C}$ · The council's preliminary key

Q117 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

A wall has two layers A and B, each made of different materials. Both layers are of same thickness. But, the thermal conductivity of material A is twice that of B. If, in the steady state, the temperature difference across the wall is $24\,^{\circ}\mathrm{C}$, then the temperature difference across the layer B is:

(A) $8\,^{\circ}\mathrm{C}$
(B) $12\,^{\circ}\mathrm{C}$
(C) $16\,^{\circ}\mathrm{C}$
(D) $20\,^{\circ}\mathrm{C}$

Answer: (C) $16\,^{\circ}\mathrm{C}$ · The council's preliminary key

Q118 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

Oxygen boils at $-183\,^{\circ}\mathrm{C}$. This temperature is approximately _____

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(A) $215\ ^\circ\mathrm{F}$
(B) $-297\ ^\circ\mathrm{F}$
(C) $329\ ^\circ\mathrm{F}$
(D) $361\ ^\circ\mathrm{F}$

Answer: (B) $-297\ ^\circ\mathrm{F}$ · The council's preliminary key

Q119 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

The water on the surface of a lake is just about to freeze. The most likely temperature at the bottom of the lake is _____

(A) $4\ ^\circ\mathrm{C}$
(B) $0\ ^\circ\mathrm{C}$
(C) $-4\ ^\circ\mathrm{C}$
(D) $-273\ ^\circ\mathrm{C}$

Answer: (A) $4\ ^\circ\mathrm{C}$ · The council's preliminary key

Q120 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

A body cools down from $52.5\ ^\circ\mathrm{C}$ to $47.5\ ^\circ\mathrm{C}$ in 5 minutes and from $47.5\ ^\circ\mathrm{C}$ to $42.5\ ^\circ\mathrm{C}$ in 7.5 minute. Then the temperature of the surroundings is _____

(A) $39\ ^\circ\mathrm{C}$
(B) $25\ ^\circ\mathrm{C}$
(C) $35\ ^\circ\mathrm{C}$
(D) $15\ ^\circ\mathrm{C}$

Answer: (C) $35\ ^\circ\mathrm{C}$ · The council's preliminary key

Q121 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

Two plates of same area are placed in contact. Their thickness as well as their thermal conductivities are in the ratio $2:3$. The outer surface of one plate is maintained at $10\ ^\circ\mathrm{C}$ and that of the other at $0\ ^\circ\mathrm{C}$. Temperature at the common surface is _____

(A) $0\ ^\circ\mathrm{C}$
(B) $25\ ^\circ\mathrm{C}$
(C) $5\ ^\circ\mathrm{C}$
(D) $6.5\ ^\circ\mathrm{C}$

Answer: (C) $5\ ^\circ\mathrm{C}$ · The council's preliminary key

Q122 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

When a meter rod made of silver at $0\ ^\circ C$ is heated to $100\ ^\circ C$, its length increased by $0.19\ cm$. Then find the coefficient of volume expansion of the silver.

(A) $0.63 \times 10^{-5}\ ^{\circ}C^{-1}$
(B) $1.9 \times 10^{-5}\ ^{\circ}C^{-1}$
(C) $5.7 \times 10^{-5}\ ^{\circ}C^{-1}$
(D) $16.1 \times 10^{-5}\ ^{\circ}C^{-1}$

Answer: (C) $5.7 \times 10^{-5}\ ^{\circ}C^{-1}$ · The council's preliminary key

Q123 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

Newton's law of cooling holds good provided the temperature difference between body and surrounding is _____

(A) very large
(B) Large
(C) Small
(D) very small

Answer: (C) Small · The council's preliminary key

Q124 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

A bimetallic strip is made of aluminium and steel ($\alpha_{Al} > \alpha_{steel}$). On heating, the strip will _____

(A) remain straight
(B) get twisted
(C) bend with aluminium on concave side
(D) bend with steel on concave side

Answer: (D) bend with steel on concave side · The council's preliminary key

Q125 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

5 g of steam at 100 $^{\circ}$C is mixed with 5 g of ice at 0 $^{\circ}$C. What is the final temperature of the mixture?

(A) 100 $^{\circ}$C
(B) 95 $^{\circ}$C
(C) 90 $^{\circ}$C
(D) 80 $^{\circ}$C

Answer: (A) 100 $^{\circ}$C · The council's preliminary key

Q126 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

50 g of copper is heated to increase its temperature by 10 °C. If the same quantity of heat is given to 10 g of water, the rise in temperature is _____ (specific heat of Cu = 420 $J.kg^{-1}.^{\circ}C^{-1}$ and specific heat of water is 4200 $J.kg^{-1}.^{\circ}C^{-1}$)

(A) $6\ ^{\circ}\mathrm{C}$
(B) $10\ ^{\circ}\mathrm{C}$
(C) $5\ ^{\circ}\mathrm{C}$
(D) $15\ ^{\circ}\mathrm{C}$

Answer: (C) $5\ ^{\circ}\mathrm{C}$ · The council's preliminary key

Q127 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

Match the following?
Column I
(i) Conversion of liquid into solid is
(ii) Conversion of liquid into vapor is
(iii) Conversion of solid into vapor directly is
(iv) Melting of ice caused by pressure is
Column II
(a) Regelation
(b) Sublimation
(c) Fusion
(d) Vaporization

(A) (i-c), (ii-d), (iii-b), (iv-a)
(B) (i-a), (ii-c), (iii-d), (iv-b)
(C) (i-c), (ii-d), (iii-a), (iv-b)
(D) (i-d), (ii-b), (iii-a), (iv-c)

Answer: (A) (i-c), (ii-d), (iii-b), (iv-a) · The council's preliminary key

Q128 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

Boiling water is changing into steam. The specific heat of boiling water is _____.

(A) zero
(B) One
(C) Infinity
(D) less than one

Answer: (C) Infinity · The council's preliminary key

Q129 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

If the volume of a block of metal changes by $0.12\ \%$ when heated through $20\ ^{\circ}\mathrm{C}$, then find its coefficient of linear expansion.

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(A) $4 \times 10^{-5}\ ^{\circ}\mathrm{C}^{-1}$
(B) $4 \times 10^{-4}\ ^{\circ}\mathrm{C}^{-1}$
(C) $2 \times 10^{-5}\ ^{\circ}\mathrm{C}^{-1}$
(D) $2 \times 10^{-4}\ ^{\circ}\mathrm{C}^{-1}$

Answer: (C) $2 \times 10^{-5}\ ^{\circ}\mathrm{C}^{-1}$ · The council's preliminary key

Q130 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

A glass vessel of volume V_o is completely filled with a liquid and its temperature is raised by ΔT. What volume of the liquid will flow over, if the coefficient of linear expansion of glass is α_g and coefficient of volume expansion of the liquid is γ_L

(A) $V_o\,\Delta T\,(\gamma_L - 3\alpha_g)$
(B) $V_o\,\Delta T\,(3\alpha_g - \gamma_L)$
(C) $(\gamma_L - 3\alpha_g)\,\Delta T$
(D) $(3\alpha_g - \gamma_L)\,\Delta T$

Answer: (A) $V_o\,\Delta T\,(\gamma_L - 3\alpha_g)$ · The council's preliminary key

Q131 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

In a steady state, the temperature at the end A and end B of a $20\ cm$ long rod AB are $100\ ^{\circ}$C and $0\ ^{\circ}$C. The temperature of a point, $9\ cm$ from A is _____

(A) $55\ ^{\circ}$C
(B) $45\ ^{\circ}$C
(C) $65\ ^{\circ}$C
(D) $50\ ^{\circ}$C

Answer: (A) $55\ ^{\circ}$C · The council's preliminary key

Q132 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

If two rods of lengths L and $2L$, having coefficients of linear expansion α and 2α respectively are connected end-to-end, then find the average coefficient of linear expansion of the composite rod.

(A) $\frac{3\alpha}{2}$
(B) $\frac{5\alpha}{2}$
(C) $\frac{5\alpha}{4}$
(D) $\frac{5\alpha}{3}$

Answer: (D) $\frac{5\alpha}{3}$ · The council's preliminary key

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Q133 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

A cylinder has a piston at temperature of $30\ ^\circ$C. There is all round clearance of $0.08\ mm$ between the piston and cylinder wall if internal diameter of the cylinder is $15\ cm$. What is the temperature at which piston will fit into the cylinder exactly? ($\alpha_p = 1.6 \times 10^{-5}/^\circ$C and $\alpha_c = 1.2 \times 10^{-5}/^\circ$C)

(A) $298\ ^\circ$C
(B) $273\ ^\circ$C
(C) $305\ ^\circ$C
(D) $268\ ^\circ$C

Answer: (A) $298\ ^\circ$C · The council's preliminary key

Q134 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Expansion during heating:

(A) increases the weight of a material
(B) decreases density of material
(C) Occurs only in solid
(D) Occurs at same rate of all liquids and solids

Answer: (B) decreases density of material · The council's preliminary key

Q135 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Match the following?
A) Ratio of change in time period of a simple pendulum with temperature to its original time period
B) Ratio of the value of a length to its scale reading
C) Reciprocal of coefficient of volume expansion for an ideal gas of constant pressure
D) $\frac{F}{YA} =$
I) $\alpha\Delta T$
II) T
III) $(1 + \alpha\Delta T)$
IV) $\frac{1}{2}\alpha\Delta T$

(A) A-IV, B-II, C-I, D-III
(B) A-III, B-IV, C-II, D-I
(C) A-IV, B-I, C-II, D-III
(D) A-IV, B-III, C-II, D-I

Answer: (D) A-IV, B-III, C-II, D-I · The council's preliminary key

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Q136 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

The moment of inertia I of uniform rod about a perpendicular bisector increases to I + ΔI, if the temperature is increased slightly by ΔT. If the coefficient of linear expansion is α then $\frac{\Delta I}{I}$ is (Assume $\frac{\Delta T}{T} \ll 1$)

(A) $\alpha \Delta T$

(B) $2\alpha \Delta T$

(C) $3\alpha \Delta T$

(D) $4\alpha \Delta T$

Answer: (B) $2\alpha \Delta T$ · The council's preliminary key

Q137 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

The radiated power of a body at $400\ \mathrm{K}$ is $1000\ \mathrm{W}$. If the temperature is raised to $800\ \mathrm{K}$, what would be the radiated power of the body?

(A) $12000\ \mathrm{W}$

(B) $15000\ \mathrm{W}$

(C) $16000\ \mathrm{W}$

(D) $18000\ \mathrm{W}$

Answer: (C) $16000\ \mathrm{W}$ · The council's preliminary key

Q138 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

A metal ball of mass $1\ \mathrm{kg}$ is heated using a $40\ \mathrm{W}$ heater in a room at $30^{\circ}\mathrm{C}$. The temperature of the ball becomes steady at $70^{\circ}\mathrm{C}$. Assuming Newton's law of cooling, the rate of loss of heat to the surrounding when the ball is at $40^{\circ}\mathrm{C}$ is

(A) $20\ \mathrm{W}$

(B) $5\ \mathrm{W}$

(C) $25\ \mathrm{W}$

(D) $10\ \mathrm{W}$

Answer: (D) $10\ \mathrm{W}$ · The council's preliminary key

Q139 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

A body cools from $70\ ^{\circ}\mathrm{C}$ to $40\ ^{\circ}\mathrm{C}$ in 5 min. Calculate the time it takes to cool from $60\ ^{\circ}\mathrm{C}$ to $40\ ^{\circ}\mathrm{C}$. The temperature of the surrounding is $20\ ^{\circ}\mathrm{C}$.

(A) 3.77 min
(B) 3.56 min
(C) 3.68 min
(D) 3.89 min

Answer: (D) 3.89 min · The council's preliminary key

Q140 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

The wavelength of the radiation emitted by a black body is 6 mm and Wein's constant is 3×10^{-3} mK. Then temperature of black body is

(A) 5 K
(B) 3 K
(C) 0.5 K
(D) 50 K

Answer: (C) 0.5 K · The council's preliminary key

Q141 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

The ratio of linear expansivity to the co-efficient of a real expansion of a rectangular sheet of a solid is

(A) 2
(B) 0.5
(C) 1
(D) 1.5

Answer: (B) 0.5 · The council's preliminary key

Q142 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

Two rods whose lengths are l_1 and l_2 with heat conductivity co-efficients k_1 and k_2 are placed end to end. The heat conductivity coefficient of a uniform rod of length $l_1 + l_2$ whose conductivity is same as that of the system of these two rods is

(A) $\frac{(l_1+l_2)k_1k_2}{k_2l_1+k_1l_2}$
(B) $\frac{(l_1+l_2)k_1k_2}{k_1l_1+k_2l_2}$
(C) $\frac{k_1l_1+k_2l_2}{(l_1+l_2)k_1k_2}$
(D) $\frac{k_1l_2+k_2l_1}{(l_1+l_2)k_1k_2}$

Answer: (A) $\frac{(l_1+l_2)k_1k_2}{k_2l_1+k_1l_2}$ · The council's preliminary key

Q143 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

A metal ball initially at pressure of $10^5\ \mathrm{P_a}$ is heated from $20\,^\circ\mathrm{C}$ to $127\,^\circ\mathrm{C}$ keeping its volume constant. The coefficient of linear expansion of metal is $10^{-5}\,^\circ\mathrm{C}^{-1}$ and bulk modulus of metal is $2 \times 10^{11}\ \mathrm{N/m^2}$.

The pressure inside the ball becomes

(A) 2×10^8 Pa
(B) 6×10^8 Pa
(C) 1×10^9 Pa
(D) 4×10^8 Pa

Answer: (B) 6×10^8 Pa · The council's preliminary key

Q144 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

Two spheres of same material and radii 5 m and 2 m are at temperature 2000 K and 2500 K respectively. The ratio of energies radiated by them per second is

(A) $64 : 25$
(B) $36 : 75$
(C) $128 : 625$
(D) $16 : 125$

Answer: (A) $64 : 25$ · Checked by our team

Q145 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

A body takes 10 minutes to cool from $60\ ^\circ C$ to $50\ ^\circ C$. The temperature of same body after next 10 minutes will be _____ (If the temperature of surroundings is $25\ ^\circ C$)

(A) $40\ ^\circ C$
(B) $48\ ^\circ C$
(C) $43\ ^\circ C$
(D) $45.5\ ^\circ C$

Answer: (C) $43\ ^\circ C$ · The council's preliminary key

Q146 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

A $10\ kW$ drilling machine is used to drill a bore in an aluminium block of mass $25\ kg$. If the machine is on for 3 minutes and 50% of the heat liberated is taken up by the block, then the raise in temperature of the block is _____ (specific heat of aluminium is $900\ J\ kg^{-1}K^{-1}$)

(A) $20\ ^\circ C$
(B) $40\ ^\circ C$
(C) $85\ ^\circ C$
(D) $150\ ^\circ C$

Answer: (B) $40\ ^\circ C$ · The council's preliminary key

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Q147 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

When a body is heated, then maximum rise will be in its

(A) Length
(B) Surface area
(C) Volume
(D) Density

Answer: (C) Volume · The council's preliminary key

Q148 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

Two blocks of ice when pressed together join to form one block because _____

(A) Of heat produced during pressing
(B) Of cold produced during pressing
(C) Melting point of ice decreases with increase of pressure
(D) Melting point of ice increases with increase in pressure

Answer: (C) Melting point of ice decreases with increase of pressure · The council's preliminary key

Q149 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

The molecular motion ceases at

(A) $273\ \mathrm{K}$
(B) 273 °C
(C) $-273\ \mathrm{K}$
(D) -273 °C

Answer: (D) -273 °C · The council's preliminary key

Q150 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

Cylindrical rod of copper of length 2 m and cross-sectional area 2 cm^2 is insulated at its curved surface. The one end of rod is maintained in steam chamber and other is maintained in ice at 0 °C. The thermal conductivity of copper is 386 $\mathrm{J.s^{-1}.m^{-1}.^{\circ}C^{-1}}$). Find the temperature at a point which is at a distance of 120 cm from the colder end.

(A) 80 °C
(B) 50 °C
(C) 60 °C
(D) 70 °C

Answer: (C) 60 °C · The council's preliminary key

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Q151 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

The wavelength of maximum emitted energy (λ_m) of a body at 700 K is 4.08 μm. If the temperature of the body is raised to 1400 K. λ_m =

(A) 1.02 μm
(B) 16.32 μm
(C) 8.16 μm
(D) 2.04 μm

Answer: (D) 2.04 μm · The council's preliminary key

Q152 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

Wein's displacement law states _____

(A) $\lambda_m T = \text{constant}$
(B) $\frac{\lambda_m}{T} = \text{constant}$
(C) $\frac{T}{\lambda_m} = \text{constant}$
(D) $\lambda_m + T = \text{constant}$

Answer: (A) $\lambda_m T = \text{constant}$ · The council's preliminary key

Q153 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

The rate of radiation of a black body at $0\ ^\circ\text{C}$ is $E\ \text{J.s}^{-1}$. The rate of radiation of the black body at $273\ ^\circ\text{C}$ will be

(A) $E\ \text{J.s}^{-1}$
(B) $4E\ \text{J.s}^{-1}$
(C) $\frac{E}{2}\ \text{J.s}^{-1}$
(D) $16\,E\ \text{J.s}^{-1}$

Answer: (D) $16\,E\ \text{J.s}^{-1}$ · The council's preliminary key

Q154 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

A steel wire of length $20\ \text{cm}$ and area of cross section $1\ \text{mm}^2$ is tied rigidly at both the ends. When the temperature of the wire is changed from $40\ ^\circ\text{C}$ to $20\ ^\circ\text{C}$, find the change in its tension. Given, the coefficient of linear expansion for steel is $1.1 \times 10^{-5}\ \text{K}^{-1}$ and young's modulus of steel is $2.0 \times 10^{11}\ \text{N.m}^{-2}$.

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(A) $22\ \mathrm{N}$
(B) $44\ \mathrm{N}$
(C) $16\ \mathrm{N}$
(D) $8\ \mathrm{N}$

Answer: (B) $44\ \mathrm{N}$ · The council's preliminary key

Q155 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

A body at $3000\,K$ emits maximum energy at a wavelength of $9660\ \text{Å}$. If the sun emits maximum energy at a wavelength of $4950\ \text{Å}$, what would be the temperature of the sun?

(A) $5855\,K$
(B) $7000\,K$
(C) $4250\,K$
(D) $8000\,K$

Answer: (A) $5855\,K$ · The council's preliminary key

Q156 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

A rectangular metal plate $8\,\mathrm{cm} \times 4\,\mathrm{cm}$ at $127^{\circ}C$ emits $E\,\mathrm{J.s^{-1}}$. If both length and breadth are halved and the temperature is raised to $327^{\circ}C$, the rate of emission is

(A) $\left(\frac{9}{4}\right) E\,\mathrm{J.s^{-1}}$
(B) $\left(\frac{81}{64}\right) E\,\mathrm{J.s^{-1}}$
(C) $\left(\frac{27}{8}\right) E\,\mathrm{J.s^{-1}}$
(D) $\left(\frac{10}{7}\right) E\,\mathrm{J.s^{-1}}$

Answer: (B) $\left(\frac{81}{64}\right) E\,\mathrm{J.s^{-1}}$ · The council's preliminary key

Q157 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

If 60% of the kinetic energy of water falling from $210\,\mathrm{m}$ high water fall is converted into heat, the raise in temperature of water at the bottom of the falls is nearly _____ (specific heat of water $= 4.2 \times 10^3\,\mathrm{J\,kg^{-1}\,K^{-1}}$)

(A) $0.6^{\circ}\mathrm{C}$
(B) $0.3^{\circ}\mathrm{C}$
(C) $1.2\,\mathrm{K}$
(D) $2.4\,\mathrm{K}$

Answer: (B) $0.3^{\circ}\mathrm{C}$ · The council's preliminary key

Q158 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

For a perfect black body, the absorption coefficient is

(A) $a = 1$
(B) $a < 1$
(C) $a > 1$
(D) $a = 0$

Answer: (A) $a = 1$ · The council's preliminary key

Q159 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

300 g of water at $25\ ^\circ\text{C}$ is added to 100 g of ice at $0\ ^\circ\text{C}$. The find temperature of mixture will be

(A) $25\ ^\circ\text{C}$
(B) $0\ ^\circ\text{C}$
(C) $12.5\ ^\circ\text{C}$
(D) $30\ ^\circ\text{C}$

Answer: (B) $0\ ^\circ\text{C}$ · The council's preliminary key

Q160 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

The temperature of a body is measured both in °C and °F. A graph is plotted with °F on x-axis and °C on y-axis. Then the cosine of angle between the graph and the x-axis is _____

(A) 0
(B) $\frac{9}{5}$
(C) $\frac{5}{\sqrt{106}}$
(D) $\frac{9}{\sqrt{106}}$

Answer: (D) $\frac{9}{\sqrt{106}}$ · The council's preliminary key

Q161 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

$5kg$ of water at $20^\circ C$ is added to $10kg$ of water at $60^\circ C$. Neglecting heat capacity of vessel and other losses, the resultant temperature will be nearly

(A) $35\ ^\circ C$
(B) $40\ ^\circ C$
(C) $47\ ^\circ C$
(D) $28\ ^\circ C$

Answer: (C) $47\ ^\circ C$ · The council's preliminary key

Q162 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

$1\ kg$ of steam at $150\ ^\circ C$ is passed from a steam chamber in to a copper coil immersed in 20 litres of water. The steam condenses in the coil and is returned to the steam chamber as water at $90\ ^\circ C$.

Latent heat of steam is $540\ cal.g^{-1}$, specific heat of the steam is $1\ cal.g^{-1}.^{\circ}C^{-1}$. Then, the rise in temperature of water is _____

(A) $75\ ^{\circ}C$
(B) $60\ ^{\circ}C$
(C) $30\ ^{\circ}C$
(D) $20\ ^{\circ}C$

Answer: (C) $30\ ^{\circ}C$ · The council's preliminary key

Q163 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

When 50 g of water at $10\ ^{\circ}C$ is mixed with 50 g of water at $100\ ^{\circ}C$, the resultant temperature is

(A) $80\ ^{\circ}C$
(B) $55\ ^{\circ}C$
(C) $25\ ^{\circ}C$
(D) $45\ ^{\circ}C$

Answer: (B) $55\ ^{\circ}C$ · The council's preliminary key

Q164 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

A calorimeter contains $0.5\ kg$ of water at $30\ ^{\circ}C$. When $0.3\ kg$ of water at $60\ ^{\circ}C$ is added to it, the resulting temperature is found to be $40\ ^{\circ}C$. The water equivalent of the calorimeter is

(A) $0.25\ kg$
(B) $0.1\ kg$
(C) $0.2\ kg$
(D) $0.25\ kg$

Answer: (B) $0.1\ kg$ · The council's preliminary key

Q165 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

Find the stress developed inside a tooth cavity filled with copper when hot tea at temperature of 57 °C is drunk. You can take body (tooth) temperature to be 37 °C and $\alpha = 1.7 \times 10^{-5}\ ^{\circ}\mathrm{C}^{-1}$, Bulk modulus for copper $B = 140 \times 10^{9}\ \mathrm{N.m^{-2}}$.

(A) $1.4 \times 10^{8}\ \mathrm{N.m^{-2}}$
(B) $1.9 \times 10^{8}\ \mathrm{N.m^{-2}}$
(C) $2.0 \times 10^{8}\ \mathrm{N.m^{-2}}$
(D) $3.4 \times 10^{7}\ \mathrm{N.m^{-2}}$

Answer: (A) $1.4 \times 10^{8}\ \mathrm{N.m^{-2}}$ · The council's preliminary key

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Q166 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

Assertion (A): A thermos bottle consists of a double walled glass vessel with the space between the two walls evacuated so that the heat transfer between the contents of the bottle and outside is minimised.
Reason(R) : The vaccum between the two walls inhibits the heat transfer by radiation mechanism.
The correct option among the following is

(A) (A) is true, (R) is true and (R) is the correct explanation for (A)
(B) (A) is true, (R) is true but (R) is not the correct explanation for (A)
(C) (A) is true but (R) is false
(D) (A) is false but (R) is true

Answer: (C) (A) is true but (R) is false · Official TGCHE final key

Q167 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

How much heat energy is supplied when 5 kg of water at 20 °C is brought to its boiling point? (Assume specific heat of water = 4.2 $J/g\,^{\circ}C$)

(A) 1680 kJ
(B) 1740 kJ
(C) 1680 J
(D) 1740 J

Answer: (A) 1680 kJ · Official TGCHE final key

Q168 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

If α_v and T are the coefficient of volume expansion and temperature for an ideal gas respectively, then

(A) $\alpha_v = \frac{1}{T}$
(B) $\alpha_v = \sqrt{T}$
(C) $\alpha_v = \frac{1}{\sqrt{T}}$
(D) $\alpha_v = \frac{1}{T^2}$

Answer: (A) $\alpha_v = \frac{1}{T}$ · Official TGCHE final key

Q169 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

If λ denotes the wavelength at which the radiative emission from a black body at a temperature T is maximum, then

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(A) $\lambda \propto T^{-1}$

(B) $\lambda \propto T^{4}$

(C) λ is independent of T

(D) $\lambda \propto T$

Answer: (A) $\lambda \propto T^{-1}$ · Official TGCHE final key

Q170 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

A heating element of mass 100 g and having specific heat of 1 J/(g °C) is exposed to surrounding air at 27 °C. The element attains a steady state temperature of 127 °C while absorbing 100 W of electric power. If the power is switched off, then approximate time taken by the element to cool down to 126 °C will be
(Neglect radiation)

(A) 0.1 s

(B) 1.0 s

(C) 5.0 s

(D) 10.0 s

Answer: (B) 1.0 s · Official TGCHE final key

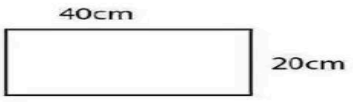
Q171 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

A sheet of steel at 20 °C has size as shown in figure below. If the co-efficient of linear expansion for steel is 10^{-5} °C^{-1} then what is the change in the area at 60 °C ?
(see the figure above)

Question Number : 97 Question Id : 7196501057 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

A sheet of steel at 20 °C has size as shown in figure below. If the co-efficient of linear expansion for steel is 10^{-5} °C^{-1} then what is the change in the area at 60 °C ?

20 °C ఉష్ణోగ్రత వద్ద వున్న ఒక ఉక్కు పలక యొక్క కొలతలు పటంలో చూపిన విధముగా వున్నవి. ఉక్కు యొక్క ఉష్ణవ్యాకోచ గుణకము 10^{-5} °C^{-1} అయితే 60 °C వద్ద ఆ పలక యొక్క వైశాల్యములో మార్పు



Options :

1. 0.84 cm^2

2. 0.64 cm^2

3. 0.24 cm^2

4. 0.14 cm^2

(A) $0.84\ \text{cm}^2$
(B) $0.64\ \text{cm}^2$
(C) $0.24\ \text{cm}^2$
(D) $0.14\ \text{cm}^2$

Answer: (B) $0.64\ \text{cm}^2$ · Official TGCHE final key

Q172 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

Different materials of two identical long bars A and B are coated with wax and have their one end immersed in a hot oil bath. When the steady state is reached, the lengths for which wax melt are l_A and l_B. If k_A and k_B are thermal conductivities of materials, then

(A) $\frac{k_A}{k_B} = \sqrt{\frac{l_A}{l_B}}$
(B) $\frac{k_A}{k_B} = \frac{l_B}{l_A}$
(C) $\frac{k_A}{k_B} = \left(\frac{l_A}{l_B}\right)^2$
(D) $\frac{k_A}{k_B} = \sqrt{\frac{l_B}{l_A}}$

Answer: (C) $\frac{k_A}{k_B} = \left(\frac{l_A}{l_B}\right)^2$ · Official TGCHE final key

Q173 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

A composite slab is prepared with two different materials A and B. The relation between their coefficient of thermal conductivity and thickness is given as $K_A = \frac{K_B}{2}$ and $X_A = 2X_B$ respectively. If the temperature of faces of A and B are 75 °C and 50 °C respectively, what will be the temperature of common surface?

(A) 75 °C
(B) 50 °C
(C) 55 °C
(D) 125 °C

Answer: (C) 55 °C · Official TGCHE final key

Q174 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

A solid of 2 kg mass absorbs 50 kJ when its temperature is raised from 20 °C to 70 °C. The specific heat capacity of this solid in unit of J/kg °C is

(A) 500
(B) 1000
(C) 1500
(D) 750

Answer: (A) 500 · Official TGCHE final key

Q175 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

A solid cylinder of radius r_1=2.5 cm, length ℓ_1 =5.0 cm and temperature 40 °C is suspended in an environment of temperature 60 °C. The thermal radiation transfer rate for cylinder is 1.0 Watt. If the cylinder is stretched until its radius becomes r_2 = 0.50 cm, the thermal radiation transfer rate is changed to :

(A) 3.35 W
(B) 4.50 W
(C) 0.75 W
(D) 1.25 W

Answer: (A) 3.35 W · Official TGCHE final key

Q176 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

A steel rod at 25 °C is observed to be 1 m long when measured by another metal scale which is correct at 0 °C. The exact length of steel rod at 0 °C is ($\alpha_{\text{steel}} = 12 \times 10^{-6}/^{\circ}\text{C}$, $\alpha_{\text{metal}} = 20 \times 10^{-6}/^{\circ}\text{C}$)

(A) $1.00002\ \text{m}$
(B) $1.0002\ \text{m}$
(C) $0.998\ \text{m}$
(D) $0.9998\ \text{m}$

Answer: (B) $1.0002\ \text{m}$ · Official TGCHE final key

Q177 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

Latent heat of vaporisation of water is $22.6 \times 10^5\ \text{J/kg}$. The amount of heat needed to convert 100 kg of water into vapor at 100 °C is

(A) $11.3 \times 10^5\ \text{J}$
(B) $11.3 \times 10^6\ \text{J}$
(C) $22.6 \times 10^6\ \text{J}$
(D) $22.6 \times 10^7\ \text{J}$

Answer: (D) $22.6 \times 10^7\ \text{J}$ · Official TGCHE final key

Q178 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

Newton's law of cooling is a special case of

(A) Wien's displacement law
(B) Kirchhoff's law
(C) Stefan's law
(D) Planck's law

Answer: (C) Stefan's law · Official TGCHE final key

Q179 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

How much thermal energy is required to change a 40 g ice cube from solid at -10°C to steam at 110° C. [Assume latent heat of fusion for water = 80 kcal / kg, specific heat of water = 1 k cal / kg °C, specific heat of Ice =0.5 kcal/kg °C, specific heat of steam =0.48 kcal / kg °C, latent heat of vaporisation of water= 540 kcal / kg °C]

(A) 29.192 k cal
(B) 40.288 k cal
(C) 35.188 k cal
(D) 30.188 k cal

Answer: (A) 29.192 k cal · Official TGCHE final key

Q180 TS EAMCET 2019 · 6 May · Shift 1 MCQ

The temperature of a body is increased from $T_1 = 127$ °C to $T_2 = 227$ °C. The ambient temperature is 27 °C. The energies emitted per second by the body at T_1 and T_2 are E_1 and E_2 respectively. The ratio $\frac{E_2}{E_1}$ is

(A) 1.8
(B) 2.7
(C) 3.1
(D) 4.3

Answer: (C) 3.1 · Official TGCHE final key

Q181 TS EAMCET 2019 · 6 May · Shift 1 MCQ

Two thin metallic spherical shells of radii 20 cm and 30 cm, respectively are placed with their centres coinciding. A material of thermal conductivity α is filled in the space between the shells. The inner shell is maintained at 300 K and the outer shell at 310 K. If the rate at which heat flows radially through the material is 40 W, find the value of α (in units of $\mathrm{J\,s^{-1}\,m^{-1}\,K^{-1}}$) :

(A) $\frac{3}{\pi}$
(B) $\frac{4\pi}{3}$
(C) $\frac{5}{3\pi}$
(D) $\frac{\pi}{2}$

Answer: (C) $\frac{5}{3\pi}$ · Official TGCHE final key

Q182 TS EAMCET 2019 · 4 May · Shift 1 MCQ

The wavelength of the radiation emitted by a black body is 1 mm and the Wien's constant is 3×10^{-3} m-K. Then the temperature of the black body will be

(A) 3 K
(B) 30 K
(C) 300 K
(D) 3000 K

Answer: (A) 3 K · Official TGCHE final key

Q183 TS EAMCET 2019 · 4 May · Shift 1 MCQ

A hot body placed in air cools down to a lower temperature. The rate of decrease of temperature is proportional to temperature difference from the surrounding. The body loses 60% and 80% of maximum heat it can loose in time t_1 and t_2 respectively. The ratio t_2/t_1 will be :

(A) $\frac{\ln(10)}{\ln(2)}$
(B) $\frac{\ln(8)}{\ln(6)}$
(C) $\frac{\ln(4)}{\ln(3)}$
(D) $\frac{\ln(5)}{\ln\left(\frac{5}{2}\right)}$

Answer: (D) $\frac{\ln(5)}{\ln\left(\frac{5}{2}\right)}$ · Official TGCHE final key

Q184 TS EAMCET 2019 · 4 May · Shift 2 MCQ

A cup of coffee cools from 150 °F to 144 °F in 1 min in a room at 72 °F. How much time will the coffee take to cool from 110 °F to 104 °F in the same room?

(A) 1.55 min
(B) 2.14 min
(C) 2.89 min
(D) 3.35 min

Answer: (B) 2.14 min · Official TGCHE final key

Q185 TS EAMCET 2019 · 3 May · Shift 1 MCQ

The area of a circular copper coin increases by 0.4% when its temperature is raised by 100 °C. The coefficient of linear expansion of the coin is

(A) $1 \times 10^{-5}/^{\circ}\mathrm{C}$
(B) $2 \times 10^{-5}/^{\circ}\mathrm{C}$
(C) $3 \times 10^{-5}/^{\circ}\mathrm{C}$
(D) $4 \times 10^{-5}/^{\circ}\mathrm{C}$

Answer: (B) $2 \times 10^{-5}/^{\circ}\mathrm{C}$ · Official TGCHE final key

Q186 TS EAMCET 2019 · 3 May · Shift 1 MCQ

A 210 W heater is used to heat 100 g water. The time required to raise the temperature of this water from 25 °C to 100 °C (specific heat capacity of water = 4200 J/kg-°C)

(A) 100 s
(B) 125 s
(C) 150 s
(D) 200 s

Answer: (C) 150 s · Official TGCHE final key

Q187 TS EAMCET 2019 · 3 May · Shift 2 MCQ

Statement A : Convection involves flow of matter within a fluid due to unequal temperatures of its parts.
Statement B : A hot bar placed under a running tap water loses heat due to effect of convection within water.
Statement C : Heat transfer always involves temperature difference between two systems.
Identify the correct option.

(A) A, B, C are true
(B) Only A and C are true
(C) Only A and B are true
(D) Only B and C are true

Options (1) or (2) were accepted. More than one answer was accepted. · Official TGCHE final key

Q188 TS EAMCET 2019 · 3 May · Shift 2 MCQ

A body cools from $70\ ^{\circ}\mathrm{C}$ to $40\ ^{\circ}\mathrm{C}$ in 5 minutes. Calculate the time it takes to cool from $60\ ^{\circ}\mathrm{C}$ to $30\ ^{\circ}\mathrm{C}$. The temperature of the surroundings is $20\ ^{\circ}\mathrm{C}$.

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(A) 1 min.
(B) 7 min.
(C) 6 min.
(D) 15 min.

Answer: (B) 7 min. · Official TGCHE final key

Q189 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

A uniform metal bar of length $10\ \mathrm{m}$ with a crack at its midpoint is clamped between two rigid supports. The bar buckles upward due to a temperature rise of $40\ ^{\circ}\mathrm{C}$. If the coefficient of linear expansion of the metal is $25 \times 10^{-6}\ ^{\circ}\mathrm{C}^{-1}$, the maximum displacement of the mid point of the bar is

(A) $11.3\ \mathrm{cm}$
(B) $22.3\ \mathrm{cm}$
(C) $33.3\ \mathrm{cm}$
(D) $44.3\ \mathrm{cm}$

Answer: (B) $22.3\ \mathrm{cm}$ · Official APSCHE final key

Q190 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

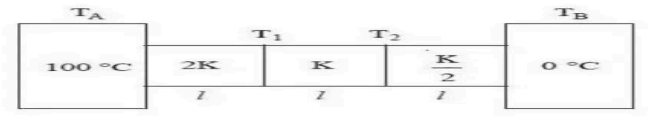
Three rods each of length 'l' and cross sectional area 'A' are joined in series between two heat reservoirs as shown in the figure. Their conductivities are $2K$, K and $\frac{K}{2}$ respectively. Assuming that the conductors are insulated from surroundings, the temperatures T_1 and T_2 of the junctions in steady state condition are respectively

(see the figure above)

Question Number : 96 Question Id : 1874634736 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Three rods each of length 'l' and cross sectional area 'A' are joined in series between two heat reservoirs as shown in the figure. Their conductivities are 2K, K and $\frac{K}{2}$ respectively. Assuming that the conductors are insulated from surroundings, the temperatures T_1 and T_2 of the junctions in steady state condition are respectively

ఒక్కొక్కటి పొడవు 'l', మధ్యచ్ఛేద వైశాల్యం 'A' గల మూడు లోహపు కడ్డీలు పటములో చూపిన విధముగా శ్రేణిసంధానములో రెండు ఉష్ణాశయాల మధ్య అమర్చబడినవి. కడ్డీల ఉష్ణవాహకత్వములు వరుసగా 2K, K మరియు $\frac{K}{2}$. పరిసరములకు ఉష్ణనష్టం లేని విధానములో కడ్డీలు కలవు. నిలకడ స్థితిలో సంధుల వద్ద T_1 మరియు T_2 ఉష్ణోగ్రతలు వరుసగా



Options :

1. $\frac{600}{7}\ ^{\circ}\mathrm{C}, \frac{400}{7}\ ^{\circ}\mathrm{C}$
2. $\frac{600}{7}\ ^{\circ}\mathrm{C}, \frac{700}{4}\ ^{\circ}\mathrm{C}$
3. $\frac{500}{6}\ ^{\circ}\mathrm{C}, \frac{600}{5}\ ^{\circ}\mathrm{C}$
4. $\frac{600}{4}\ ^{\circ}\mathrm{C}, \frac{400}{7}\ ^{\circ}\mathrm{C}$

(A) $\frac{600}{7}\,^{\circ}\mathrm{C},\ \frac{400}{7}\,^{\circ}\mathrm{C}$

(B) $\frac{600}{7}\,^{\circ}\mathrm{C},\ \frac{700}{4}\,^{\circ}\mathrm{C}$

(C) $\frac{500}{6}\,^{\circ}\mathrm{C},\ \frac{600}{5}\,^{\circ}\mathrm{C}$

(D) $\frac{600}{4}\,^{\circ}\mathrm{C},\ \frac{400}{7}\,^{\circ}\mathrm{C}$

Answer: (A) $\frac{600}{7}\,^{\circ}\mathrm{C},\ \frac{400}{7}\,^{\circ}\mathrm{C}$ · Official APSCHE final key

Q191 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

Two metallic spheres P and Q made of same material have same smoothness but the weight of P is 8 times that of Q. If the two are heated to same temperature and left to cool, then the ratio of rate of cooling of Q to that of P is

(A) 4

(B) 8

(C) 2

(D) 1

Answer: (C) 2 · Official APSCHE final key

Q192 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

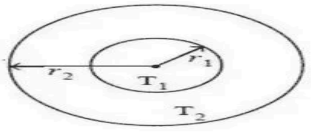
Figure shows a system of two concentric spheres of radii r_1 and r_2 at temperatures T_1 and T_2 respectively. The radial rate of flow of heat in a substance filled between the two concentric spheres is proportional to

(see the figure above)

Question Number : 95 Question Id : 1874634575 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Figure shows a system of two concentric spheres of radii r_1 and r_2 at temperatures T_1 and T_2 respectively. The radial rate of flow of heat in a substance filled between the two concentric spheres is proportional to

పటంలో చూపబడినట్లు ఉన్న రెండు ఏకకేంద్ర గోళాల వ్యాసార్ధాలు r_1 మరియు r_2 లు మరియు వాటి ఉష్ణోగ్రతలు వరుసగా T_1 మరియు T_2 ఆ రెండు ఏకకేంద్ర గోళాల మధ్య నింపిన పదార్థంలో ఉష్ణప్రవాహం యొక్క రేడియల్ రేటు ఈ క్రింది దానికి అనులోమానుపాతంలో ఉంటుంది.



Options :

1. $r_2 - r_1$

2. $\ln\left(\frac{r_2}{r_1}\right)$

3. $\frac{r_2 - r_1}{r_1 r_2}$

4. $\frac{r_1 r_2}{r_2 - r_1}$

(A) $r_2 - r_1$
(B) $\ln\left(\frac{r_2}{r_1}\right)$
(C) $\frac{r_2 - r_1}{r_1 r_2}$
(D) $\frac{r_1 r_2}{r_2 - r_1}$

Answer: (D) $\frac{r_1 r_2}{r_2 - r_1}$ · Official APSCHE final key

Q193 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

A composite bar of uniform cross section is made of $25\ \text{cm}$ of Copper, $10\ \text{cm}$ of Nickel and $15\ \text{cm}$ of Aluminium with perfect thermal contacts. The free copper end of the rod is at $100\ ^\circ\text{C}$ and the free Aluminium end is at $0\ ^\circ\text{C}$. If $K_{\text{Cu}} = 2\,K_{\text{Al}}$ and $K_{\text{Al}} = 3\,K_{\text{Ni}}$, then the temperatures of Cu-Ni and Ni-Al junctions are respectively (Assume no loss of heat occurs from the sides of the rod, K-thermal conductivity)

(A) $82.3\ ^\circ\text{C},\ 31.3\ ^\circ\text{C}$
(B) $78.3\ ^\circ\text{C},\ 26.1\ ^\circ\text{C}$
(C) $70\ ^\circ\text{C},\ 23.3\ ^\circ\text{C}$
(D) $90.3\ ^\circ\text{C},\ 30.1\ ^\circ\text{C}$

Answer: (B) $78.3\ ^\circ\text{C},\ 26.1\ ^\circ\text{C}$ · Official APSCHE final key

Q194 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

The specific heat capacities of three liquids A, B and C are in the ratio 1:2:3 and the masses of the liquids are in the ratio 1:1:1. The temperatures of the liquids A, B and C are $15\ ^\circ\text{C}$, $30\ ^\circ\text{C}$ and $45\ ^\circ\text{C}$ respectively. Then match the resultant temperature of the mixture given in list-II with the corresponding mixture given in list-I.

List-I
A) Mixture of liquids A and B
B) Mixture of liquids B and C
C) Mixture of liquids C and A
D) Mixture of liquids A, B and C

List-II
I) $25\ ^\circ\text{C}$
II) $35\ ^\circ\text{C}$
III) $37.5\ ^\circ\text{C}$
IV) $39\ ^\circ\text{C}$

The correct answer is

(A) A-I, B-II, C-III, D-IV
(B) A-II, B-I, C-IV, D-III
(C) A-I, B-IV, C-III, D-II
(D) A-IV, B-I, C-III, D-II

Answer: (C) A-I, B-IV, C-III, D-II · Official APSCHE final key

Q195 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

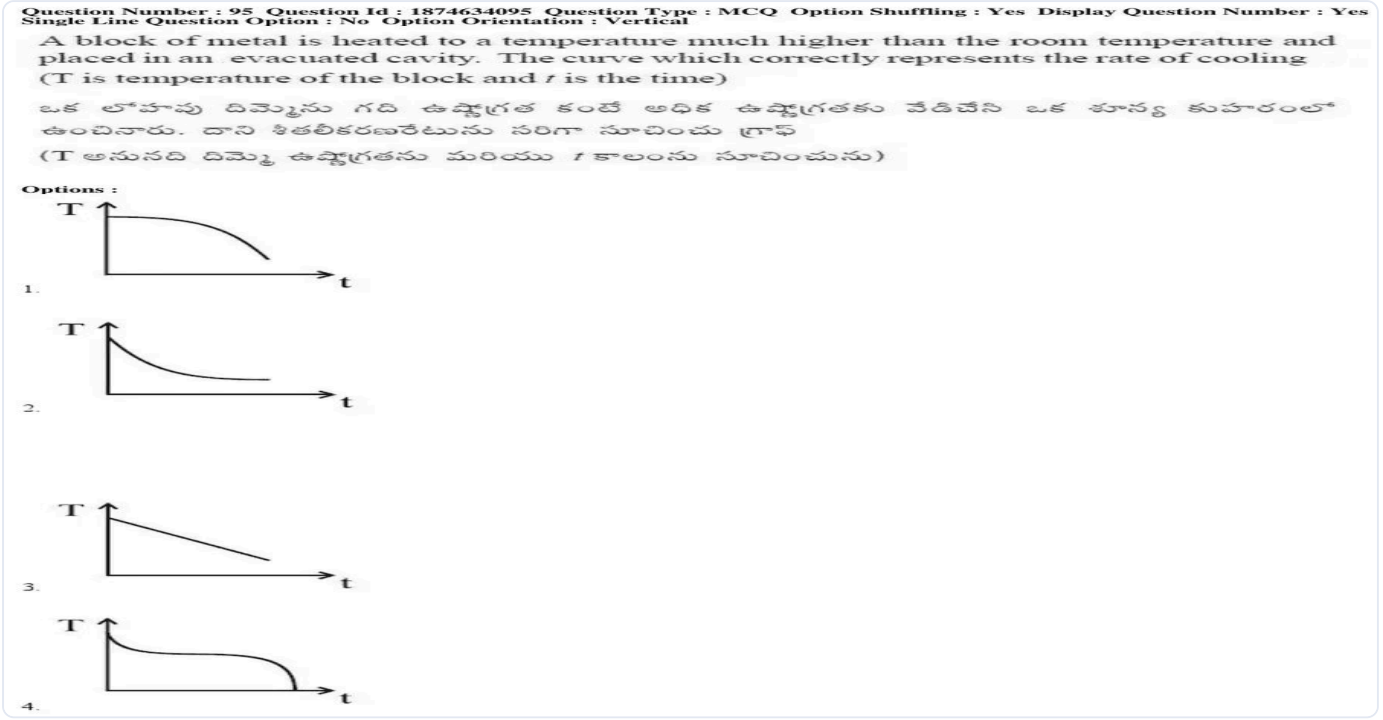
Electrical energy costs 25 paisa per kilowatt hour. Assuming that no energy is wasted, the cost of heating $4.6\ \text{kg}$ of water from $25\ ^\circ\text{C}$ to the boiling point is

(A) 25 paisa
(B) 50 paisa
(C) 20 paisa
(D) 10 paisa

Answer: (D) 10 paisa · Official APSCHE final key

Q196 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

A block of metal is heated to a temperature much higher than the room temperature and placed in an evacuated cavity. The curve which correctly represents the rate of cooling (T is temperature of the block and t is the time)



(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (B) · Official APSCHE final key

Q197 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

A solid copper sphere of density ρ, specific heat capacity C and radius r is initially at 200 K. It is suspended inside a chamber whose walls are at 0 K. The time required (in μs) for the temperature of the sphere to drop to 100 K is (σ is Stefan's constant and all the quantities are in SI units)

(A) $48\,\frac{r\rho C}{\sigma}$
(B) $\frac{1}{48}\,\frac{r\rho C}{\sigma}$
(C) $\frac{27}{7}\,\frac{r\rho C}{\sigma}$
(D) $\frac{7}{27}\,\frac{r\rho C}{\sigma}$

Answer: (B) $\frac{1}{48}\,\frac{r\rho C}{\sigma}$ · Official APSCHE final key

Q198 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

A hammer of mass 200 kg strikes a steel block of mass 200 g with a velocity $8\,\mathrm{ms}^{-1}$. If 23% of the energy is utilized to heat the steel block, the rise in temperature of the block is (specific heat capacity of steel = $460\,\mathrm{J\,kg^{-1}\,K^{-1}}$)

(A) $8\,^{\circ}\mathrm{C}$
(B) $16\,^{\circ}\mathrm{C}$
(C) $12\,^{\circ}\mathrm{C}$
(D) $24\,^{\circ}\mathrm{C}$

Answer: (B) $16\,^{\circ}\mathrm{C}$ · Official APSCHE final key

Q199 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

The walls of a closed cubical box of edge 60 cm are made of material of thickness 1 mm and thermal conductivity $4\times10^{-4}\,\mathrm{cal\,s^{-1}\,cm^{-1}\,^{\circ}C^{-1}}$. The interior of the box is maintained $1000\,^{\circ}\mathrm{C}$ above the outside temperature by a heater placed inside the box and connected across 400 V DC supply. The resistance of the heater is

(A) $4.41\,\Omega$
(B) $44.1\,\Omega$
(C) $0.441\,\Omega$
(D) $441\,\Omega$

Answer: (C) $0.441\,\Omega$ · Official APSCHE final key

Q200 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

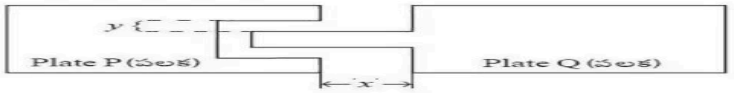
Two metal plates P and Q of same material are arranged as shown in the figure. If both the plates are uniformly heated through same range of temperature, then

(see the figure above)

Question Number : 95 Question Id : 1874634255 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Two metal plates P and Q of same material are arranged as shown in the figure. If both the plates are uniformly heated through same range of temperature, then

ఒకే పదార్థంతో చేయబడిన P మరియు Q అను రెండు లోహపు పలకలు పటంలో చూపిన విధంగా అమర్చబడినవి. రెండు పలకలను ఏకరీతిగా ఒకే ఉష్ణోగ్రత అవధిలో వేడిచేసిన



Options :

1. Both x and y increase
x మరియు y రెండూ పెరుగును
2. Both x and y decrease
x మరియు y రెండూ తగ్గును
3. x decreases and y increases
x తగ్గును మరియు y పెరుగును
4. x increases and y decreases
x పెరుగును మరియు y తగ్గును

(A) Both x and y increase

(B) Both x and y decrease

(C) x decreases and y increases

(D) x increases and y decreases

Answer: (C) x **decreases and** y **increases** · Official APSCHE final key

Q201 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

A liquid of mass 250 g is kept warm in a vessel using an electric heater. The liquid is maintained at $57\ ^\circ\mathrm{C}$ when the power supplied by the heater is 30 W and surrounding temperature is $27\ ^\circ\mathrm{C}$. As the heater is switched off, it took 10 s time for the temperature of the liquid to fall from $47\ ^\circ\mathrm{C}$ to $46.9\ ^\circ\mathrm{C}$. The specific heat capacity of the liquid is

(A) $8000\ \mathrm{J\,kg^{-1}\,K^{-1}}$

(B) $9000\ \mathrm{J\,kg^{-1}\,K^{-1}}$

(C) $6000\ \mathrm{J\,kg^{-1}\,K^{-1}}$

(D) $12000\ \mathrm{J\,kg^{-1}\,K^{-1}}$

Answer: (A) $8000\ \mathrm{J\,kg^{-1}\,K^{-1}}$ · Official APSCHE final key

Q202 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

The focal length of a spherical mirror made of steel is 150 cm. If the temperature of the mirror increases by 200 K, its focal length becomes
(coefficient of linear expansion of steel $= 12 \times 10^{-6}\ ^{\circ}\mathrm{C}^{-1}$)

(A) 186.3 cm
(B) 153.6 cm
(C) 150.036 cm
(D) 150.36 cm

Answer: (D) 150.36 cm · Official APSCHE final key

Q203 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

A metal rod of length 10 cm and area of cross section $2.8 \times 10^{-4}\ \mathrm{m}^2$ is covered with a non-conducting substance. One end of it is maintained at $80\ ^{\circ}\mathrm{C}$, while the other end is put in ice at $0\ ^{\circ}\mathrm{C}$. It is found that 20 g of ice melts in 5 min. The thermal conductivity of the metal in $\mathrm{J\,s^{-1}\,m^{-1}\,K^{-1}}$ is
(Latent heat of ice is $80\ \mathrm{cal\,g^{-1}}$)

(A) 70
(B) 80
(C) 90
(D) 100

Answer: (D) 100 · Official APSCHE final key

Q204 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

The densities of wood and benzene at $0\ ^{\circ}\mathrm{C}$ are $880\ \mathrm{kg\,m^{-3}}$ and $900\ \mathrm{kg\,m^{-3}}$ respectively. The coefficient of volume expansion is $1.2 \times 10^{-3}\ ^{\circ}\mathrm{C}^{-1}$ for wood and $1.5 \times 10^{-3}\ ^{\circ}\mathrm{C}^{-1}$ for benzene. Then the temperature at which a piece of wood just sinks in benzene is

(A) $88\ ^{\circ}\mathrm{C}$
(B) $90\ ^{\circ}\mathrm{C}$
(C) $83.3\ ^{\circ}\mathrm{C}$
(D) $90.3\ ^{\circ}\mathrm{C}$

Answer: (C) $83.3\ ^{\circ}\mathrm{C}$ · Official APSCHE final key

Q205 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

A window used to thermally insulate a room from outside consists of two parallel glass sheets each of area $2.6\ \mathrm{m}^2$ and thickness 1 cm separated by 5 cm thick stagnant air. In the steady state, the room-glass interface is at $18\ ^{\circ}\mathrm{C}$ and the glass-outdoor interface is at $-2\ ^{\circ}\mathrm{C}$. If the thermal conductivities of glass and air are respectively $0.8\ \mathrm{Wm^{-1}K^{-1}}$ and $0.08\ \mathrm{Wm^{-1}K^{-1}}$, the rate of flow of heat through the window is

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(A) 15 W
(B) 40 W
(C) 60 W
(D) 80 W

Answer: (D) 80 W · Official APSCHE final key

Q206 TS EAMCET 2018 · 7 May · Shift 1 MCQ

The resistance of a thermometer is 100 Ω at the triple point of water (273 K) and is 300 Ω at the melting point of gold (∼ 873 K). The temperature at which the resistance of the thermometer is 200 Ω is

(A) 273 K
(B) 373 K
(C) 473 K
(D) 573 K

Answer: (D) 573 K · The council's preliminary key

Q207 TS EAMCET 2018 · 5 May · Shift 1 MCQ

An electric heater with constant heat supply rate is used to convert a certain amount of liquid ammonia to saturated vapour at high pressure. The heater takes 14 minutes to bring the liquid at $15\,^{\circ}\mathrm{C}$ to the boiling point of $50\,^{\circ}\mathrm{C}$ and 92 minutes to convert the liquid at the boiling point wholly to vapour. If the specific heat capacity of liquid ammonia is 4.9 kJ/kg K, the latent heat of vaporization of ammonia in kJ/kg is

(A) 557
(B) 981
(C) 1127
(D) 2250

Answer: (C) 1127 · The council's preliminary key

Q208 TS EAMCET 2018 · 5 May · Shift 1 MCQ

An Aluminium rod of length 1 m and a steel rod of length 2 m both having same cross-sectional area, are soldered together end-to-end. The thermal conductivity of aluminium rod and steel rod is $200\ \mathrm{J\,s^{-1}m^{-1}K^{-1}}$ and $50\ \mathrm{J\,s^{-1}m^{-1}K^{-1}}$ respectively. The temperatures of the free ends are maintained at 300 K and 500 K. What is the temperature of the junction

(A) 322 K
(B) 350 K
(C) 367 K
(D) 400 K

Answer: (A) 322 K · The council's preliminary key

Q209 TS EAMCET 2018 · 5 May · Shift 2 MCQ

The pressure to be applied to the ends of a steel cylinder to keep its length constant upon raising its temperature by $100\ ^\circ\mathrm{C}$ is
(Thermal expansion coefficient, $\alpha = 11 \times 10^{-6}$ /K, Young's Modulus $= 200\ \mathrm{GPa}$)

(A) $0.22 \times 10^{9}\ \mathrm{Pa}$
(B) $5.5 \times 10^{-6}\ \mathrm{Pa}$
(C) $0.22\ \mathrm{Pa}$
(D) $55\ \mathrm{Pa}$

Answer: (A) $0.22 \times 10^{9}\ \mathrm{Pa}$ · The council's preliminary key

Q210 TS EAMCET 2018 · 5 May · Shift 2 MCQ

A glass beaker contains $200\ \mathrm{gm}$ of carbonated water initially at $20\ ^\circ\mathrm{C}$. How much ice should be added to obtain the final temperature of $0\ ^\circ\mathrm{C}$ with all ice melted, if the initial temperature of ice is $-10\ ^\circ\mathrm{C}$. Neglect heat capacity of glass
[Use : $C_{\text{water}} = 4190\ \mathrm{J/kg\,^\circ C}$, $C_{\text{ice}} = 2100\ \mathrm{J/kg\,^\circ C}$, $L_F = 3.34 \times 10^{5}\ \mathrm{J/kg}$]

(A) $47\ \mathrm{gm}$
(B) $76\ \mathrm{gm}$
(C) $200\ \mathrm{gm}$
(D) $22\ \mathrm{gm}$

Answer: (A) $47\ \mathrm{gm}$ · The council's preliminary key

Q211 TS EAMCET 2018 · 5 May · Shift 2 MCQ

Heat loss takes place from a body maintained at a temperature of $400\ ^\circ\mathrm{C}$ to the surrounding air at $30\ ^\circ\mathrm{C}$ by convection and to the surrounding surfaces at $30\ ^\circ\mathrm{C}$ by radiation. The Newton's cooling coefficient is $20\ \mathrm{W/m^2\,K}$ and the Stefan-Boltzmann constant is $5.67 \times 10^{-8}\ \mathrm{W/m^2\,K^4}$. If the rate of heat loss by convection is equal to the rate of heat loss by radiation, the emissivity of the body surface is

(A) 0.35
(B) 0.46
(C) 0.55
(D) 0.66

Answer: (D) 0.66 · The council's preliminary key

Q212 TS EAMCET 2018 · 4 May · Shift 2 MCQ

A container is filled with liquid that cools from $100\,^{\circ}\mathrm{C}$ to $70\,^{\circ}\mathrm{C}$ in 5 min, when kept at room temperature of $30\,^{\circ}\mathrm{C}$. The time that it must have taken to cool down to $80\,^{\circ}\mathrm{C}$ from its initial temperature approximately is

(A) 1.7 min
(B) 2.6 min
(C) 8.2 min
(D) 4.1 min

Answer: (B) 2.6 min · The council's preliminary key

Q213 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

The temperature of a spherical black body is inversely proportional to its radius. If its radius is doubled then the power radiating from it will be

(A) Doubled
(B) $\frac{1}{4}$ times of initial value
(C) Halved
(D) 4 times of initial value

Answer: (B) $\frac{1}{4}$ times of initial value · The council's preliminary key

Q214 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

A metal sphere immersed in water weighs W_1 at $0\,^{\circ}\mathrm{C}$ and W_2 at $50\,^{\circ}\mathrm{C}$. The coefficient of cubical expansion of the metal is less than that of water. Then

(A) $W_1 > W_2$
(B) $W_1 < W_2$
(C) $W_1 = W_2$
(D) $W_1 = 2W_2$

Answer: (B) $W_1 < W_2$ · The council's preliminary key

Q215 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

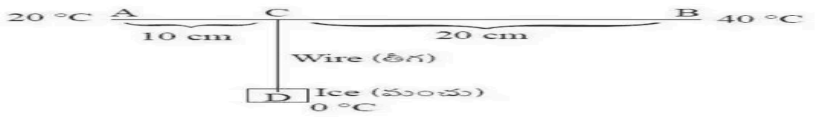
In the figure shown, AB is a rod of length $30\ \mathrm{cm}$, area of cross-section $1\ \mathrm{cm}^2$ and thermal conductivity 336 SI units. The ends A and B are at constant temperatures $20\ ^\circ\mathrm{C}$ and $40\ ^\circ\mathrm{C}$ respectively. A point C of the rod is connected to ice at $0\ ^\circ\mathrm{C}$ in a thermally insulated box D through a highly conducting wire of negligible heat capacity. The rate at which ice melts in the box is ($L_{\mathrm{ice}} = 80\ \mathrm{cal\,g^{-1}}$)

(see the figure above)

Question Number : 96 Question Id : 4557344576 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In the figure shown, AB is a rod of length 30 cm, area of cross-section 1 cm² and thermal conductivity 336 SI units. The ends A and B are at constant temperatures 20 °C and 40 °C respectively. A point C of the rod is connected to ice at 0 °C in a thermally insulated box D through a highly conducting wire of negligible heat capacity. The rate at which ice melts in the box is (L_{ice} = 80 cal g⁻¹)

పటములో చూపబడిన AB అను కడ్డీ పొడవు 30 cm, మధ్యచ్ఛేద వైశాల్యము 1 cm² మరియు ఉష్ణ వాహకత్వం 336 SI ప్రమాణాలు. కడ్డీ యొక్క A మరియు B కొనల స్థిరఉష్ణోగ్రతలు వరుసగా 20 °C మరియు 40 °C. కడ్డీలోని C బిందువుని విస్మరించదగిన ఉష్ణధారణ సామర్థ్యాన్ని, అత్యంత ఎక్కువ ఉష్ణవహనం కలిగిన తీగతో ఉష్ణబంధక పెట్టె D లో 0 °C ఉష్ణోగ్రత వద్ద ఉన్న మంచుకు కలిపారు. పెట్టెలోని మంచు కరుగురేటు ($L_{మంచు}$ = 80 cal g⁻¹)



Options :
1. 84 mgs⁻¹
2. 84 gs⁻¹
3. 20 mgs⁻¹
4. 40 mgs⁻¹

(A) $84\ \mathrm{mgs^{-1}}$
(B) $84\ \mathrm{gs^{-1}}$
(C) $20\ \mathrm{mgs^{-1}}$
(D) $40\ \mathrm{mgs^{-1}}$

Answer: (D) $40\ \mathrm{mgs^{-1}}$ · The council's preliminary key

Q216 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

The time taken for a calorimeter containing 75 g of water at $62\ ^\circ\mathrm{C}$ to cool to $58\ ^\circ\mathrm{C}$ is 9 minutes. When the calorimeter contains 105 g of water, it takes 12 minutes to cool from $62\ ^\circ\mathrm{C}$ to $58\ ^\circ\mathrm{C}$. The water equivalent of the calorimeter is _____

(A) 10 g
(B) 15 g
(C) 20 g
(D) 30 g

Answer: (B) 15 g · The council's preliminary key

Q217 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

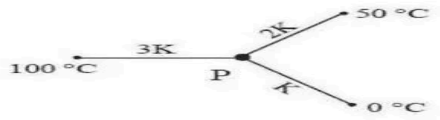
Three rods of same dimensions have thermal conductivites 3K, 2K and K. They are arranged as shown in the figure below. Then in the steady state the temperature of the junction 'P' is

(see the figure above)

Question Number : 96 Question Id : 4557344096 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Three rods of same dimensions have thermal conductivites 3K, 2K and K. They are arranged as shown in the figure below. Then in the steady state the temperature of the junction 'P' is

ఒకే కొలతలు గల మూడు కడ్డీల ఉష్ణవాహన గుణకాలు 3K, 2K మరియు K. ఆ కడ్డీలను క్రింది పటములో చూపినట్లుగా ఏర్పాటు చేసినారు. నిలకడ స్థితిలో వాటి సంధి 'P' వద్ద ఉష్ణోగ్రత



Options :

1. $\frac{200}{3}$ °C
2. $\frac{100}{3}$ °C
3. 75 °C
4. $\frac{50}{3}$ °C

(A) $\frac{200}{3}\ ^\circ\mathrm{C}$
(B) $\frac{100}{3}\ ^\circ\mathrm{C}$
(C) $75\ ^\circ\mathrm{C}$
(D) $\frac{50}{3}\ ^\circ\mathrm{C}$

Answer: (A) $\frac{200}{3}\ ^\circ\mathrm{C}$ · The council's preliminary key

Q218 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

Steam at $100\ ^\circ\mathrm{C}$ is passed into $1\ \mathrm{kg}$ of water contained in a calorimeter at $9\ ^\circ\mathrm{C}$ till the temperature of water and calorimeter is increased to $90\ ^\circ\mathrm{C}$. The mass of the steam condensed is nearly
(Water equivalent of calorimeter $= 0.1\ \mathrm{kg}$
Specific heat of water $= 1\ \mathrm{calg}^{-1}\ ^\circ\mathrm{C}^{-1}$
Latent heat of vapourisation $= 540\ \mathrm{calg}^{-1}$)

(A) $81\ \mathrm{g}$
(B) $162\ \mathrm{g}$
(C) $243\ \mathrm{g}$
(D) $486\ \mathrm{g}$

Answer: (B) $162\ \mathrm{g}$ · The council's preliminary key

Q219 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

Three very large plates of same area are kept parallel and close to each other. They are considered as ideal black surfaces and have very high thermal conductivity. First and third plates are maintained at absolute temperatures 2T and 3T respectively. Temperature of the middle plate in steady state is

(A) $\left(\frac{65}{2}\right)^{\frac{1}{4}}T$
(B) $\left(\frac{97}{4}\right)^{\frac{1}{4}}T$
(C) $\left(\frac{97}{2}\right)^{\frac{1}{4}}T$
(D) $(97)^{\frac{1}{4}}T$

Answer: (C) $\left(\frac{97}{2}\right)^{\frac{1}{4}}T$ · The council's preliminary key

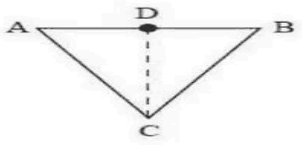
Q220 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

As shown in the figure, an equilateral triangle ABC is formed by joining three rods of equal lengths and D is the midpoint of AB. Coefficient of linear expansion of the material of AB is α_1 and that of AC and BC is α_2. If the length DC remains constant for small changes in temperature, then
(see the figure above)

Question Number : 95 Question Id : 4557343935 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

As shown in the figure, an equilateral triangle ABC is formed by joining three rods of equal lengths and D is the midpoint of AB. Coefficient of linear expansion of the material of AB is α_1 and that of AC and BC is α_2. If the length DC remains constant for small changes in temperature, then

పటంలో చూపిన విధంగా సమాన పొడవుగల మూడు కడ్డీలతో ABC సమబాహుత్రిభుజాన్ని ఏర్పాటు చేశారు. AB మధ్య బిందువు D. కడ్డీ AB పదార్థ దైర్ఘ్య వ్యాకోచ గుణకము α_1. కడ్డీలు AC మరియు BC పదార్థాల దైర్ఘ్యవ్యాకోచ గుణకము α_2, స్వల్ప ఉష్ణోగ్రత మార్పులకు DC పొడవు స్థిరముగా ఉంటే,



Options :
1. $\alpha_1 = \alpha_2$
2. $\alpha_1 = 4\alpha_2$
3. $\alpha_2 = 4\alpha_1$
4. $\alpha_1 = \frac{\alpha_2}{2}$

(A) $\alpha_1 = \alpha_2$
(B) $\alpha_1 = 4\alpha_2$
(C) $\alpha_2 = 4\alpha_1$
(D) $\alpha_1 = \frac{\alpha_2}{2}$

Answer: (B) $\alpha_1 = 4\alpha_2$ · The council's preliminary key

Q221 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

Match the following List - I with List - II.
List - I
A) When ice melts into water
B) When water changes into steam
C) Melting point of ice
D) Boiling point of water
List - II
I) Volume increases
II) Volume decreases
III) Increases with increase of pressure
IV) Decreases with increase in pressure
The correct answer is

(A) A-I, B-II, C-III, D-IV
(B) A-II, B-I, C-IV, D-III
(C) A-III, B-II, C-IV, D-I
(D) A-II, B-I, C-III, D-IV

Answer: (B) A-II, B-I, C-IV, D-III · The council's preliminary key

Q222 TS EAMCET 2017 · 12 May · Offline MCQ

A metre scale made of steel reads accurately at $25\,^{\circ}\text{C}$. Suppose in an experiment an accuracy of 0.06 mm in 1 m is required, the range of temperature in which the experiment can be performed with this metre scale is (coefficient of linear expansion of steel is $11 \times 10^{-6}/^{\circ}\text{C}$)

(A) $19\,^{\circ}\text{C}$ to $31\,^{\circ}\text{C}$
(B) $25\,^{\circ}\text{C}$ to $32\,^{\circ}\text{C}$
(C) $18\,^{\circ}\text{C}$ to $25\,^{\circ}\text{C}$
(D) $18\,^{\circ}\text{C}$ to $32\,^{\circ}\text{C}$

Answer: (A) $19\,^{\circ}\text{C}$ to $31\,^{\circ}\text{C}$ · The council's preliminary key

Q223 TS EAMCET 2017 · 12 May · Offline MCQ

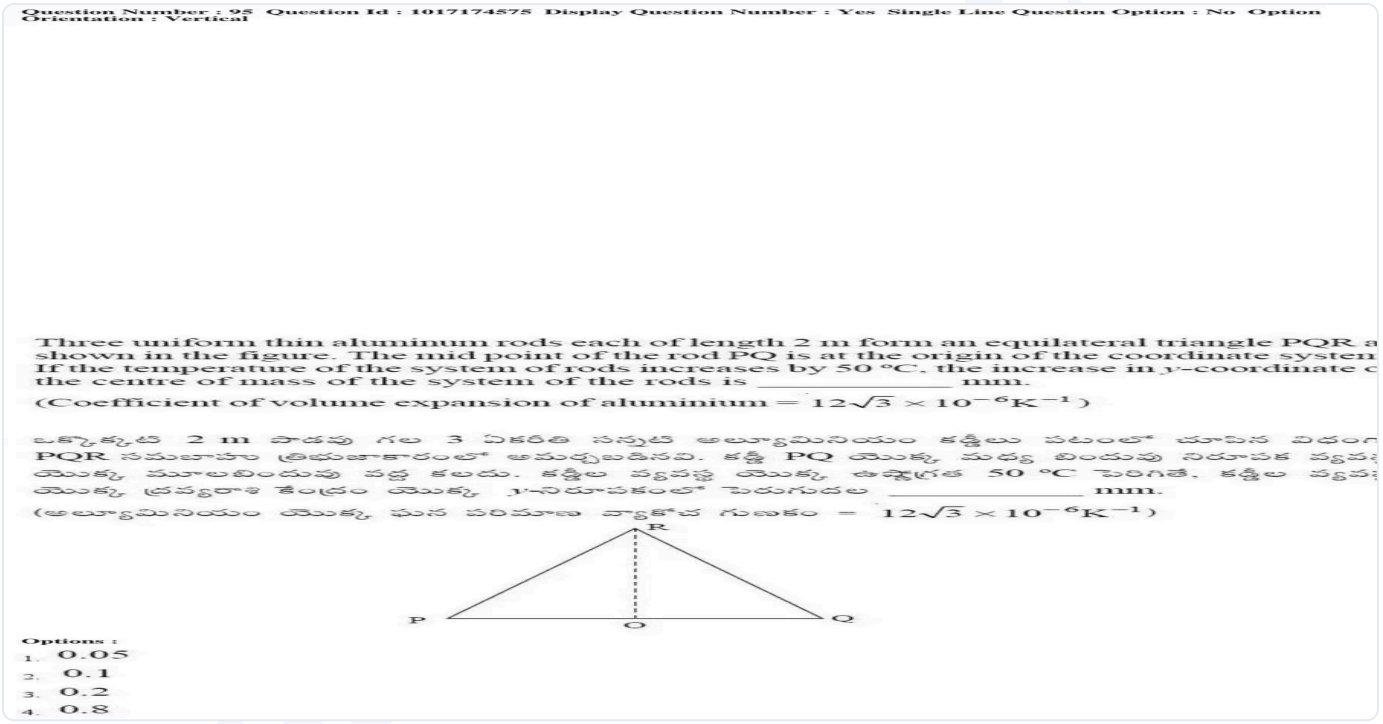
A thermocol box has a total wall area (including the lid) of $1.0\,\text{m}^2$ and wall thickness of 3 cm. It is filled with ice at $0\,^{\circ}\text{C}$. If the average temperature outside the box is $30\,^{\circ}\text{C}$ throughout the day, the amount of ice that melts in one day is
[use $K_{\text{thermocol}} = 0.03\,\text{W/m K}$, $L_{\text{fusion(ice)}} = 3.00 \times 10^5\,\text{J/kg}$]

(A) 1 kg
(B) 2.88 kg
(C) 25.92 kg
(D) 8.64 kg

Answer: (D) 8.64 kg · The council's preliminary key

Q224 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

Three uniform thin aluminum rods each of length 2 m form an equilateral triangle PQR as shown in the figure. The mid point of the rod PQ is at the origin of the coordinate system. If the temperature of the system of rods increases by $50\,^{\circ}\mathrm{C}$, the increase in y-coordinate of the centre of mass of the system of the rods is _____ mm.
(Coefficient of volume expansion of aluminium $= 12\sqrt{3} \times 10^{-6}\,\mathrm{K}^{-1}$)
(see the figure above)



(A) 0.05
(B) 0.1
(C) 0.2
(D) 0.8

Answer: (C) 0.2 · The council's preliminary key

Q225 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

A wall is made of equally thick layers 'P' and 'Q' of different materials. Thermal conductivity of 'Q' is half of that of the 'P'. In the steady state, if the temperature difference across the wall is 24 °C, then the temperature difference across the layer 'P' is _____

(A) $12\,^{\circ}\mathrm{C}$
(B) $8\,^{\circ}\mathrm{C}$
(C) $16\,^{\circ}\mathrm{C}$
(D) $4\,^{\circ}\mathrm{C}$

Answer: (B) $8\,^{\circ}\mathrm{C}$ · The council's preliminary key

Q226 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

If equal masses of 10 liquids of specific heats s, 2s, 3s, ... 10s at temperatures $10\,^{\circ}\mathrm{C}$, $20\,^{\circ}\mathrm{C}$, $30\,^{\circ}\mathrm{C}$, ... $100\,^{\circ}\mathrm{C}$ respectively are mixed, the resultant temperature of the mixture is _____

(A) $60\,^{\circ}\mathrm{C}$
(B) $50\,^{\circ}\mathrm{C}$
(C) $70\,^{\circ}\mathrm{C}$
(D) $80\,^{\circ}\mathrm{C}$

Answer: (C) $70\,^{\circ}\mathrm{C}$ · The council's preliminary key

Q227 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

Two closed containers of same dimensions made of different materials are completely filled with ice. The ice in the first container takes 20 minutes and that in the second container takes 10 minutes, respectively for complete melting. The ratio of the thermal conductivities of the materials of the two containers is _____.

(A) $1:2$
(B) $2:1$
(C) $3:1$
(D) $1:3$

Answer: (A) $1:2$ · The council's preliminary key

Q228 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

A pellet of mass 'm' and specific heat capacity 'c' fired from an air gun hits a steel plate with speed 'v'. During the impact, 50% of the pellet's kinetic energy is converted to thermal energy in it. The rise in the temperature of the pellet is

(A) $\frac{v^2}{2c}$
(B) $\frac{v^2}{4c}$
(C) $\frac{mv^2}{2c}$
(D) $\frac{mv^2}{4c}$

Answer: (B) $\frac{v^2}{4c}$ · The council's preliminary key

Q229 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

A hail stone of mass 42 g falls from a height 1.8 km and if its entire potential energy is converted into latent heat, the mass of the hail stone on reaching the ground is ($g = 10\ ms^{-2}$, $L_{ice} = 3.36 \times 10^5\ J\,kg^{-1}$)

(A) 40.75 g
(B) 39.75 g
(C) 38.75 g
(D) 37.75 g

Answer: (B) 39.75 g · The council's preliminary key

Q230 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

One end of a uniform metal rod of length 100 cm is placed in ice and the other end is placed in boiling water. A point of the rod which is at a distance of 60 cm from the ice end is maintained at a constant temperature of $325\ ^\circ C$. If 2 g of water is converted into steam per second, the mass of ice melted per second in steady state is
(Latent heat of steam = 6.75 times latent heat of fusion of ice)

(A) 13 g
(B) 4 g
(C) 6.75 g
(D) 8 g

Answer: (A) 13 g · The council's preliminary key

Q231 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

If a 4 kg of ice is inside a closed cubical thermocol box of side length 20 cm and wall thickness 4 cm then the mass of the ice remaining after 10 hours is nearly
(The out side temperature = $50\ ^\circ C$
co-efficient of thermal conductivity of thermocol = $0.01\ Js^{-1}m^{-1}\,^\circ C^{-1}$
Latent heat of fusion of ice = $335 \times 10^3\ J\,kg^{-1}$)

(A) $3.678\ \text{kg}$
(B) $6.378\ \text{kg}$
(C) $2.87\ \text{kg}$
(D) $1.87\ \text{kg}$

Answer: (A) $3.678\ \text{kg}$ · The council's preliminary key

Q232 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

2 kg of ice at $-20\ ^\circ\text{C}$ is mixed with 5 kg of water at $20\ ^\circ\text{C}$. Final mass of water formed is

(A) 7 kg
(B) 6 kg
(C) 4 kg
(D) 2 kg

Answer: (B) 6 kg · The council's preliminary key

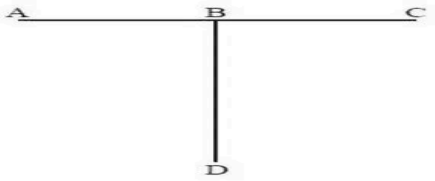
Q233 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

Three conducting rods AB, BC and BD made of same material and same cross section are arranged as shown in the figure. Temperatures at the points A, D and C are maintained at 20°C, 90°C and 0°C respectively. The ratio of lengths of BD to BC when there is no heat flow in AB, is
(see the figure above)

Question Number : 96 Question Id : 1017173776 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Three conducting rods AB, BC and BD made of same material and same cross section a arranged as shown in the figure. Temperatures at the points A, D and C are maintained 20°C, 90°C and 0°C respectively. The ratio of lengths of BD to BC when there is no he flow in AB, is

ఒకే పదార్థముతో చేయబడి, ఒకే మధ్యచ్ఛేద వైశాల్యం గల మూడు వాహక కడ్డీలు AB, BC మరియ BDలు పటములో చూపిన విధముగా అమర్చబడినవి. A, D మరియు C ల బిందువుల ఉష్ణోగ్రతల వరుసగా 20 °C, 90 °C మరియు 0 °C వద్ద ఉంచబడినవి. AB లో ఉష్ణ ప్రసరణ లేనపుడు B మరియు BC కడ్డీల పొడవుల నిష్పత్తి



Options :
1. $\frac{2}{9}$
2. $\frac{7}{2}$
3. $\frac{2}{7}$
4. $\frac{9}{2}$

(A) $\frac{2}{9}$

(B) $\frac{7}{2}$

(C) $\frac{2}{7}$

(D) $\frac{9}{2}$

Answer: (B) $\frac{7}{2}$ · The council's preliminary key

Q234 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

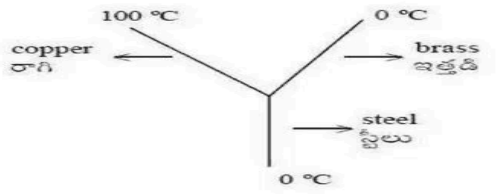
Three metal rods made of copper, brass and steel each of area of cross-section $4\ \text{cm}^2$ are joined as shown in the figure. Their lengths are respectively 46 cm, 13 cm and 12 cm. Their coefficients of thermal conductivity are respectively 0.92, 0.26 and 0.12, all in CGS units. The rods are thermally insulated from the surroundings except at the ends. Rate of flow of heat through the copper rod, in cal s^{-1} is

(see the figure above)

Question Number : 95 Question Id : 1017173935 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Three metal rods made of copper, brass and steel each of area of cross-section 4 cm^2 are joined as shown in the figure. Their lengths are respectively 46 cm, 13 cm and 12 cm. Their coefficients of thermal conductivity are respectively 0.92, 0.26 and 0.12, all in CGS units. The rods are thermally insulated from the surroundings except at the ends. Rate of flow of heat through the copper rod, in cal s^{-1} is

ఒక్కొక్కటి 4 cm^2 మధ్యచ్ఛేద వైశాల్యము గల మూడు లోహపు కడ్డీలు వరుసగా రాగి, ఇత్తడి మరియు స్టీలుతో చేయబడి, పటంలో చూపిన విధంగా అతికించబడ్డాయి. వాని పొడవులు వరుసగా 46 cm, 13 cm మరియు 12 cm. వాని ఉష్ణవాహకత్వ గుణకాలు వరుసగా 0.92, 0.26 మరియు 0.12 (అన్నీ CGS ప్రమాణాలలో). కడ్డీ కొనలు తప్ప మిగిలినవన్నీ పరిసరాలతో ఉష్ణ బంధనం చేయబడ్డాయి. రాగి కడ్డీలో ఉష్ణప్రవాహ రేటు, cal s^{-1} లలో



Options :

1. 2.4
2. 6.0
3. 4.8
4. 8.2

(A) 2.4

(B) 6.0

(C) 4.8

(D) 8.2

Answer: (C) 4.8 · The council's preliminary key

Q235 TS EAMCET 2016 · 15 May · Offline MCQ

A slab of stone area $3600\ \text{cm}^2$ and thickness 10 cm is exposed on the lower surface to steam at 100°C. A block of ice at 0°C rests on upper surface of the slab. In one hour 4.8 kg of ice is melted. The

thermal conductivity of the stone in $\mathrm{Js^{-1}m^{-1}k^{-1}}$ is (Latent heat of ice $= 3.36 \times 10^5$ J/kg)

(A) 12.0
(B) 10.5
(C) 1.02
(D) 1.24

Answer: (D) 1.24 · Official TGCHE final key

Q236 TS EAMCET 2016 · 15 May · Offline MCQ

The surface of a black body is at a temperature 727°C and its cross section is $1\ \mathrm{m^2}$. Heat radiated from this surface in one minute in Joules is (Stefan's constant $= 5.7 \times 10^{-8}\ \mathrm{W/m^2/k^4}$)

(A) 34.2×10^5
(B) 2.5×10^5
(C) 3.42×10^5
(D) 2.5×10^6

Answer: (A) 34.2×10^5 · Official TGCHE final key

Q237 AP EAMCET 2016 · 29 Apr · Offline MCQ

A hunter fired a metallic bullet of mass 'm' kg from a gun towards an obstacle and it just melts when it is stopped by the obstacle. The initial temperature of the bullet is 300 K. If $\frac{1}{4}^{th}$ of heat is absorbed by the obstacle, then the minimum velocity of the bullet is
[Melting point of bullet = 600 K,
Specific heat of bullet = $0.03\ \mathrm{cal\,g^{-1}\,^\circ C^{-1}}$,
Latent heat of fusion of bullet = $6\ \mathrm{cal\,g^{-1}}$]

(A) $410\ \mathrm{ms^{-1}}$
(B) $260\ \mathrm{ms^{-1}}$
(C) $460\ \mathrm{ms^{-1}}$
(D) $310\ \mathrm{ms^{-1}}$

Answer: (A) $410\ \mathrm{ms^{-1}}$ · The council's preliminary key

Q238 AP EAMCET 2016 · 29 Apr · Offline MCQ

'M' kg of water at 't' °C is divided into two parts so that one part of mass 'm' kg when converted into ice at 0°C would release enough heat to vapourise the other part, then $\frac{m}{M}$ is equal to
[Specific heat of water = $1\ \mathrm{cal\,g^{-1}\,^\circ C^{-1}}$,
Latent heat of fusion of ice = $80\ \mathrm{cal\,g^{-1}}$,
Latent heat of steam = $540\ \mathrm{cal\,g^{-1}}$]

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(A) $640 - t$
(B) $\frac{720 - t}{640}$
(C) $\frac{640 + t}{720}$
(D) $\frac{640 - t}{720}$

Answer: (D) $\frac{640 - t}{720}$ · The council's preliminary key

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Q239 AP EAMCET 2014 · 22 May · Offline MCQ

A steam at 100°C is passed into 1 kg of water contained in a calorimeter of water equivalent 0.2 kg at 9°C, till the temperature of the calorimeter and water in it is increased to 90°C. The mass of steam condensed in kg is nearly (sp. heat of water = 1 cal/g-$^{\circ}$C, Latent heat of vaporisation = 540 cal/g)

(A) 0.81
(B) 0.18
(C) 0.27
(D) 0.54

Answer: (B) 0.18 · The council's preliminary key

Q240 AP EAMCET 2014 · 22 May · Offline MCQ

A very small hole in an electric furnace is used for heating metals. The hole nearly acts as a black body. The area of the hole is 200 mm^2. To keep a metal at 727°C, heat energy flowing through this hole per sec, in joules is ($\sigma = 5.67 \times 10^{-8}\ \mathrm{Wm^{-2}k^{-4}}$)

(A) 22.68
(B) 2.268
(C) 1.134
(D) 11.34

Answer: (D) 11.34 · The council's preliminary key

Q241 AP EAMCET 2013 · 10 May · Offline MCQ

A glass flask of volume one litre is filled completely with mercury at $0^{\circ}\mathrm{C}$. The flask is now heated to $100^{\circ}\mathrm{C}$. Coefficient of volume expansion of mercury is $1.82 \times 10^{-4}/^{\circ}\mathrm{C}$ and coefficient of linear expansion of glass is $0.1 \times 10^{-4}/^{\circ}\mathrm{C}$. During this process, amount of mercury which overflows is

(A) 21.2 cc
(B) 15.2 cc
(C) 2.12 cc
(D) 18.2 cc

Answer: (B) 15.2 cc · The council's preliminary key

Q242 AP EAMCET 2013 · 10 May · Offline MCQ

On a temperature scale Y, water freezes at -160° Y and boils at -50° Y. On this Y scale, a temperature of 340 K is

(A) -106.3° Y
(B) -96.3° Y
(C) -86.3° Y
(D) -76.3° Y

Answer: (C) -86.3° Y · The council's preliminary key

Q243 AP EAMCET 2013 · 10 May · Offline MCQ

Two bodies A and B of equal surface area have thermal emissivities of 0.01 and 0.81 respectively. The two bodies are radiating energy at the same rate. Maximum energy is radiated from the two bodies A and B at wavelengths λ_A and λ_B respectively. Difference in these two wavelengths is 1 μm. If the temperature of the body A is 5802 K, then value of λ_B is

(A) $\frac{1}{2}\ \mu\text{m}$
(B) $1\ \mu\text{m}$
(C) $2\ \mu\text{m}$
(D) $\frac{3}{2}\ \mu\text{m}$

Answer: (D) $\frac{3}{2}\ \mu\text{m}$ · The council's preliminary key

Q244 AP EAMCET 2013 · 10 May · Offline MCQ

The ends of an element of zinc wire are kept at a small temperature difference ΔT and a small current (I) is passed through the wire. Then, the heat developed per unit time

(A) is proportional to ΔT and I
(B) is proportional to I^3 and ΔT
(C) is proportional to Thomson coefficient of the metal
(D) is proportional to ΔT only

Answer: (A) is proportional to ΔT and I · The council's preliminary key

Q245 AP EAMCET 2012 · 12 May · Offline MCQ

When a liquid is heated in copper vessel its coefficient of apparent expansion is $6 \times 10^{-6}/^\circ\text{C}$. When the same liquid is heated in a steel vessel its coefficient of apparent expansion is $24 \times 10^{-6}/^\circ\text{C}$. If coefficient of linear expansion for copper is $18 \times 10^{-6}/^\circ\text{C}$, the coefficient of linear expansion for steel is

(A) $20 \times 10^{-6}/^{\circ}\mathrm{C}$
(B) $24 \times 10^{-6}/^{\circ}\mathrm{C}$
(C) $36 \times 10^{-6}/^{\circ}\mathrm{C}$
(D) $12 \times 10^{-6}/^{\circ}\mathrm{C}$

Answer: (D) $12 \times 10^{-6}/^{\circ}\mathrm{C}$ · Official APSCHE final key

Q246 AP EAMCET 2012 · 12 May · Offline MCQ

When the temperature of a body increases from T to T + ΔT, its moment of inertia increases from I to I + ΔI. If α is the coefficient of linear expansion of the material of the body, then $\frac{\Delta I}{I}$ is (neglect higher orders of α)

(A) $\alpha \Delta T$
(B) $2\alpha \Delta T$
(C) $\frac{\Delta T}{\alpha}$
(D) $\frac{2\alpha}{\Delta T}$

Answer: (B) $2\alpha \Delta T$ · Official APSCHE final key

Q247 AP EAMCET 2012 · 12 May · Offline MCQ

Power radiated by a black body at temperature T_1 is P and it radiates maximum energy at a wavelength λ_1. If the temperature of the black body is changed from T_1 to T_2, it radiates maximum energy at a wavelength $\frac{\lambda_1}{2}$. The power radiated at T_2 is

(A) 2 P
(B) 4 P
(C) 8 P
(D) 16 P

Answer: (D) 16 P · Official APSCHE final key

Q248 AP EAMCET 2012 · 12 May · Offline MCQ

Total emf produced in a thermocouple does not depend on

(A) the metals in the thermocouple
(B) thomson coefficients of the metals in the thermocouple
(C) temperature of the junctions
(D) the duration of time for which the current is passed through thermocouple

Answer: (D) the duration of time for which the current is passed through thermocouple · Official APSCHE final key

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Q249 AP EAMCET 2011 · 8 May · Offline MCQ

A non-conducting body floats in a liquid at $20^{\circ}\mathrm{C}$ with $\frac{2}{3}$ of its volume immersed in the liquid. When liquid temperature is increased to $100^{\circ}\mathrm{C}$, $\frac{3}{4}$ of body's volume is immersed in the liquid. Then the coefficient of real expansion of the liquid is (neglecting the expansion of container of the liquid) :

(A) $15.6 \times 10^{-4}\ {}^{\circ}\mathrm{C}^{-1}$
(B) $156 \times 10^{-4}\ {}^{\circ}\mathrm{C}^{-1}$
(C) $1.56 \times 10^{-4}\ {}^{\circ}\mathrm{C}^{-1}$
(D) $0.156 \times 10^{4}\ {}^{\circ}\mathrm{C}^{-1}$

Answer: (A) $15.6 \times 10^{-4}\ {}^{\circ}\mathrm{C}^{-1}$ · The council's preliminary key

Q250 AP EAMCET 2011 · 8 May · Offline MCQ

Two slabs A and B of different materials but of the same thickness are joined end to end to form a composite slab. The thermal conductivities of A and B are 'k_1' and 'k_2' respectively. A steady temperature difference of $12^{\circ}\mathrm{C}$ is maintained across the composite slab. If $k_1 = \frac{k_2}{2}$, the temperature difference across slab A is :

(A) $4^{\circ}\mathrm{C}$
(B) $6^{\circ}\mathrm{C}$
(C) $8^{\circ}\mathrm{C}$
(D) $10^{\circ}\mathrm{C}$

Answer: (C) $8^{\circ}\mathrm{C}$ · The council's preliminary key

Q251 AP EAMCET 2011 · 8 May · Offline MCQ

The thermo e.m.f. of a hypothetical thermocouple varies with the temperature θ of hot junction as $E = a\theta + b\theta^2$ in volts, where the ratio a/b is $700^{\circ}\mathrm{C}$. If the cold junction is kept at $0^{\circ}\mathrm{C}$, then the neutral temperature is :

(A) $700^{\circ}\mathrm{C}$
(B) $1400^{\circ}\mathrm{C}$
(C) $390^{\circ}\mathrm{C}$
(D) no neutral temperature is possible for this thermocouple

Answer: (D) no neutral temperature is possible for this thermocouple · The council's preliminary key

Q252 AP EAMCET 2010 · 30 May · Offline MCQ

A bimetallic strip is formed out of two identical strips, one of copper and the other of brass. The coefficients of linear expansion of the two metals are α_C and α_B. On heating, the temperature of the strip increases by ΔT and the strip bends to form an arc of radius R. Then R is proportional to :

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(A) ΔT
(B) $\frac{1}{\Delta T}$
(C) $\sqrt{\Delta T}$
(D) $\frac{1}{\sqrt{\Delta T}}$

Answer: (B) $\frac{1}{\Delta T}$ · Official APSCHE final key

Q253 AP EAMCET 2010 · 30 May · Offline MCQ

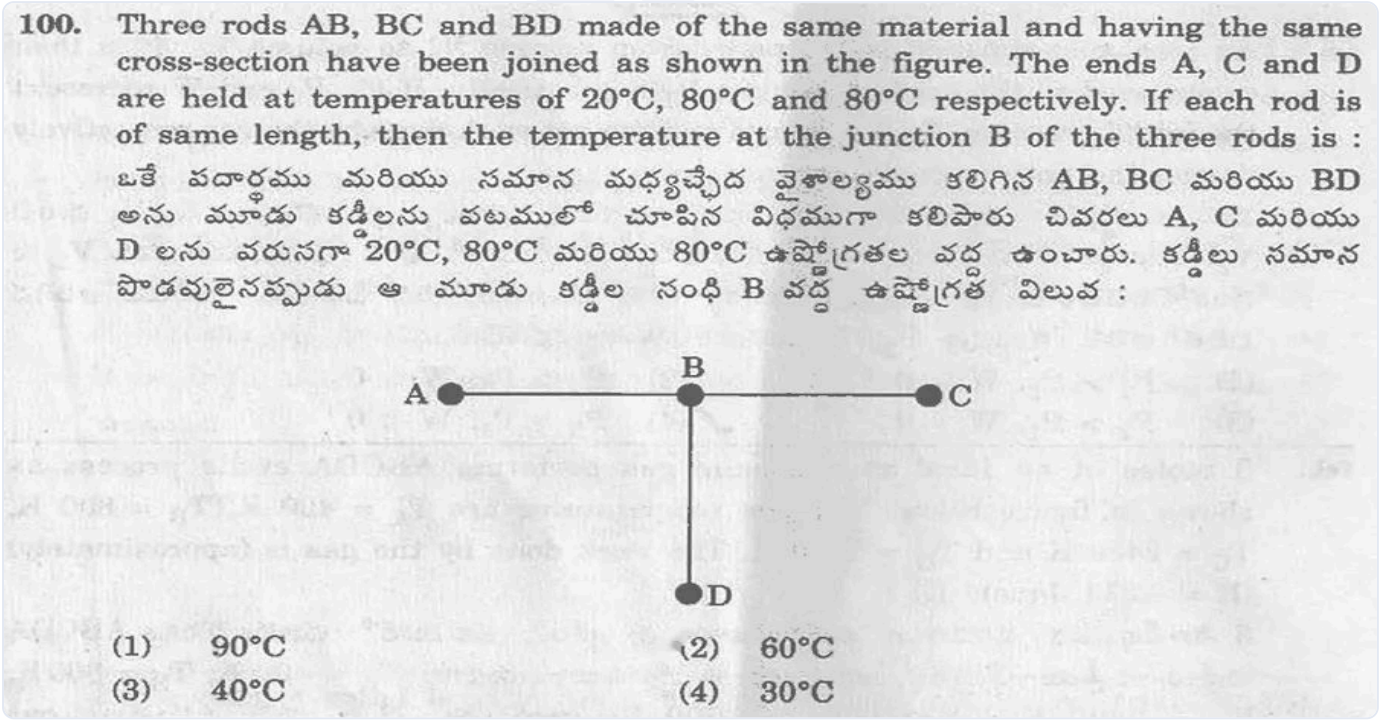
Three rods of equal lengths are joined to form an equilateral triangle ABC. D is the mid-point of AB. The coefficient of linear expansion is α_1 for material of rod AB and α_2 for material of rods AC and BC. If the distance DC remains constant for small changes in temperature, then :

(A) $\alpha_1 = 2\alpha_2$
(B) $\alpha_1 = 4\alpha_2$
(C) $\alpha_1 = 8\alpha_2$
(D) $\alpha_1 = \alpha_2$

Answer: (B) $\alpha_1 = 4\alpha_2$ · Official APSCHE final key

Q254 AP EAMCET 2010 · 30 May · Offline MCQ

Three rods AB, BC and BD made of the same material and having the same cross-section have been joined as shown in the figure. The ends A, C and D are held at temperatures of $20^\circ C$, $80^\circ C$ and $80^\circ C$ respectively. If each rod is of same length, then the temperature at the junction B of the three rods is : *(see the figure above)*


100. Three rods AB, BC and BD made of the same material and having the same cross-section have been joined as shown in the figure. The ends A, C and D are held at temperatures of 20°C, 80°C and 80°C respectively. If each rod is of same length, then the temperature at the junction B of the three rods is :
ఒకే పదార్థము మరియు సమాన మధ్యచ్ఛేద వైశాల్యము కలిగిన AB, BC మరియు BD అను మూడు కడ్డీలను పటములో చూపిన విధముగా కలిపారు చివరలు A, C మరియు D లను వరుసగా 20°C, 80°C మరియు 80°C ఉష్ణోగ్రతల వద్ద ఉంచారు. కడ్డీలు సమాన పొడవులైనప్పుడు ఆ మూడు కడ్డీల సంధి B వద్ద ఉష్ణోగ్రత విలువ :

(1) 90°C (2) 60°C
(3) 40°C (4) 30°C

(A) $90^{\circ}\mathrm{C}$
(B) $60^{\circ}\mathrm{C}$
(C) $40^{\circ}\mathrm{C}$
(D) $30^{\circ}\mathrm{C}$

Answer: (B) $60^{\circ}\mathrm{C}$ · Official APSCHE final key

Q255 AP EAMCET 2010 · 30 May · Offline MCQ

The Thermo e.m.f of a thermo-couple is given by, $\varepsilon = aT + bT^2$, where $a/b = -200^{\circ}\mathrm{C}$. If the cold function (sic) is kept at $30^{\circ}\mathrm{C}$, then the inversion temperature is (ε in volts, T is in centigrade) :

(A) $103\ \mathrm{K}$
(B) $143\ \mathrm{K}$
(C) $333\ \mathrm{K}$
(D) $443\ \mathrm{K}$

Answer: (D) $443\ \mathrm{K}$ · Official APSCHE final key

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