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PHYSICS · EAPCET (EAMCET)

Thermodynamics

Previous Year Questions with answers

285 questions · **148** papers · **2010–2026** · newest paper first

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What is in this PDF: every Thermodynamics 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.

Step-by-step solutions for every question are free in the EdLoop EAPCET app (Google Play) and on app.edloop.in. More chapters: pyq.edloop.in/free-pdfs/

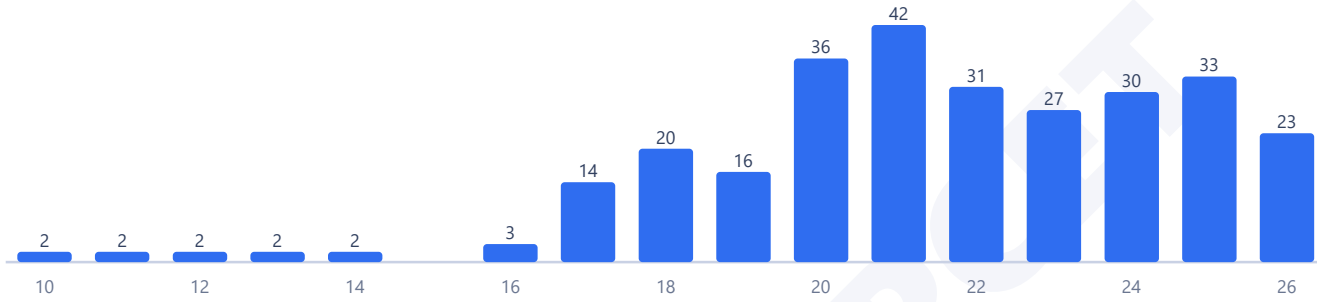
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Chapter at a glance

4.7%	285	77 of 77	285 / 0
of Physics questions, 2022–2026	questions, 2010–2026	papers asked it, 2022–2026	MCQ / numerical, 2010–2026

Trend. Steady: 1.9 questions per paper in 2024–2026 against 1.9 in 2022–2023.

Questions per year



Counts are the questions we hold: 285 in 148 papers. 8 questions in this chapter came back in more than one paper.

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

First Law & Processes	187
Second Law & Engines	87
Basics & Zeroth Law	11

How often it comes up

Thermodynamics is one of the heaviest chapters in Class 11 physics across both Andhra Pradesh and Telangana engineering entrance exams. In the papers we hold for AP and TS EAPCET between 2022 and 2026, the chapter contributed 144 questions across 77 papers. That yields an average of 1.9 questions per paper, making up 4.7% of all physics questions in that recent window. Taking into account all years in our archive from 2010 to 2026, Thermodynamics delivered 285 questions across 149 papers, maintaining an average of 1.9 questions per paper and a 4.8% subject share. During the earlier period from 2010 to 2021, our archive records 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 provided 86 questions across 46 papers, holding a 4.7% share. Longer-term comparisons show that the subject share from 2024 to 2026 is about the same when compared with the early 2010–2021 papers, and about the same when measured against the recent 2022–2026 five-year span.

State-wise data reveals an interesting divergence in weighting. Between 2022 and 2026, AP EAPCET papers in our set contributed 106 questions across 48 papers, averaging 2.2 questions per paper and claiming 5.5% of all AP physics questions. Over the same period, TS EAPCET contributed 38 questions across 29 papers in our set, averaging 1.3 questions per paper and accounting for 3.3% of TS physics questions. Thermodynamics has appeared every year since 2022 and featured in every paper across both states in the recent five-year window. The chapter ranks 5th of 28 physics chapters by question share between 2022 and 2026. The busiest single sitting in our collection was 2021, which produced 42 questions across 17 papers.

Most-asked topics

Questions fall into three syllabus divisions:

- **First Law & Processes**: 98 questions were asked between 2022 and 2026, contributing to an all-time archive total of 187 questions. It tests the first law relation ΔQ = ΔU + ΔW, work done in isobaric, isochoric, isothermal, and

adiabatic processes, polytropic expansions, and cyclic paths on indicator diagrams.

- **Second Law & Engines**: Recent sittings yielded 41 questions, while our complete dataset contains 87 questions. Key concepts include Carnot engine efficiency, heat absorbed and rejected, coefficient of performance of refrigerators, and Kelvin-Planck and Clausius statements.
- **Basics & Zeroth Law**: A smaller pool of 5 questions appeared recently, out of 11 questions across the entire collection. It tests the zeroth law of thermodynamics, thermal equilibrium, and distinctions between extensive and intensive thermodynamic variables.

What the questions look like

The majority of questions require numerical calculation rooted in specific heat ratios and state changes. A common pattern provides an ideal gas expanding under constant pressure and asks for the fraction of supplied heat that converts into mechanical work versus internal energy. For a diatomic gas where the ratio of specific heats is seven-fifths, students must quickly recognize that internal energy change receives five-sevenths of the total heat supplied, with work done consuming two-sevenths.

Carnot cycle calculations form another staple. Questions regularly supply an initial operating efficiency alongside the sink temperature, then ask how much the source temperature must increase to raise efficiency by a specified percentage. P-V indicator diagrams frequently depict closed clockwise or anticlockwise cycles made of rectangular, triangular, or elliptic paths, requiring students to calculate net work from enclosed geometric area.

How to practise it

Start by mastering the sign conventions and work expressions for every standard thermodynamic path. For an isothermal expansion at temperature T, work done is $n R T \ln(V_2 / V_1)$. For an adiabatic expansion following $P V^{\gamma} =$ constant, work done is $(P_1 V_1 - P_2 V_2) / (\gamma - 1) = n R (T_1 - T_2) / (\gamma - 1)$. Notice that internal energy change ΔU depends solely on initial and final temperatures via $n C_v \Delta T$, regardless of whether the path is reversible, irreversible, or polytropic.

Next, focus on heat engine and refrigerator relationships. For a Carnot engine operating between source temperature T_1 and sink temperature T_2, efficiency is $\eta = 1 - (T_2 / T_1) = W / Q_1$. For a domestic refrigerator operating between the same two thermal reservoirs, coefficient of performance is $\beta = Q_2 / W = T_2 / (T_1 - T_2)$. Connect them through the standard identity $\eta \beta = 1 - \eta$.

Finally, practise cyclic processes on P-V diagrams. Remember that clockwise cycles represent heat engines producing positive net work, while anticlockwise cycles represent refrigerators or heat pumps requiring external work input.

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Q1 AP EAPCET 2026 · 18 May · Shift 1 MCQ

The pressure P_1 and density d_1 of a diatomic gas change to P_2 and d_2 during an adiabatic operation. Find the value of $\frac{P_1}{P_2}$, if $\frac{d_2}{d_1} = 32$

(A) 128
(B) $\frac{1}{64}$
(C) 64
(D) $\frac{1}{128}$

Answer: (D) $\frac{1}{128}$ · The council's preliminary key

Q2 AP EAPCET 2026 · 18 May · Shift 1 MCQ

A thermodynamic system goes from states

i) P, V to P, 2V

ii) P_1, V to $2\mathrm{P}_1$, V

Then works done in these two cases are

(A) i) Zero ii) Zero
(B) i) Zero ii) $\mathrm{P}_1\mathrm{V}$
(C) i) PV ii) $\mathrm{P}_1\mathrm{V}$
(D) i) PV ii) Zero

Answer: (D) i) PV ii) Zero · The council's preliminary key

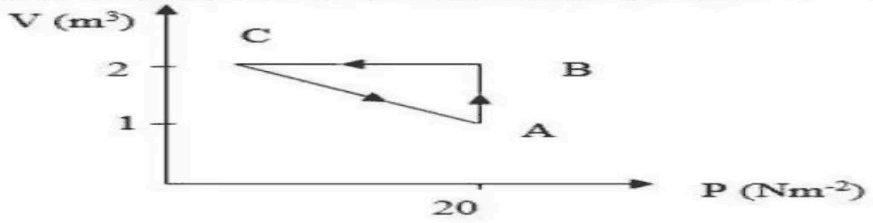
Q3 AP EAPCET 2026 · 18 May · Shift 2 MCQ

An ideal gas is taken through the cycle $A \to B \to C \to A$ as shown in figure. If the net heat supplied to the gas in the cycle is 10 J, the work done in the process $C \to A$ is

(see the figure above)

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An ideal gas is taken through the cycle $A \rightarrow B \rightarrow C \rightarrow A$ as shown in figure. If the net heat supplied to the gas in the cycle is 10 J, the work done in the process $C \rightarrow A$ is



పటంలో చూపిన విధంగా ఒక ఆదర్శవాయువును $A \rightarrow B \rightarrow C \rightarrow A$ చక్రం ద్వారా తీసుకుపోయారు. చక్రంలో వాయువుకు అందజేసిన ఫలిత ఉష్ణం 10 J అయితే, $C \rightarrow A$ ప్రక్రియలో జరిగిన పని

Options :

1. -5 J
2. -10 J
3. +5 J
4. +10 J

(A) -5 J

(B) -10 J

(C) +5 J

(D) +10 J

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

Q4 AP EAPCET 2026 · 15 May · Shift 1 MCQ

The pressure and density of a diatomic gas $\left(\gamma = \frac{7}{5}\right)$ change adiabatically from (p, d) to (p^1, d^1). If $\frac{d^1}{d} = 32$, then $\frac{p^1}{p}$ should be

(A) $\frac{1}{128}$

(B) 32

(C) 128

(D) $\frac{1}{32}$

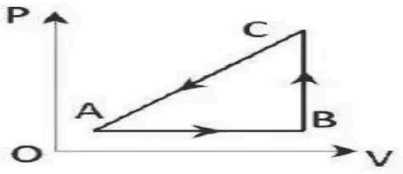
Answer: (C) 128 · The council's preliminary key

Q5 AP EAPCET 2026 · 15 May · Shift 2 MCQ

The P-V diagram of a system undergoing thermodynamic transformation is shown in the figure. The work done on the system in going from A→B→C→ A is 50J and 20 Cal heat is given to the system. The change in internal energy between A and C is

(see the figure above)

The P-V diagram of a system undergoing thermodynamic transformation is shown in the figure. The work done on the system in going from A→B→C→ A is 50J and 20 Cal heat is given to the system. The change in internal energy between A and C is



ఒక వ్యవస్థ యొక్క ఉష్ణ యాంత్రిక పరివర్తనాన్ని తెలియజేసే P–V గ్రాఫ్ పటంలో చూపబడినది. వ్యవస్థ A→B→C→A పరివర్తనంలో, దానిపై జరిగిన పని 50 J మరియు దానికివ్వబడిన ఉష్ణం 20 Cal అయితే A మరియు C స్థితుల మధ్య అంతరిక శక్తిలో భేదం ఎంత?

Options :

1. 34 J
2. 70 J
3. 84 J
4. 134 J

(A) 34 J
(B) 70 J
(C) 84 J
(D) 134 J

Answer: (D) 134 J · The council's preliminary key

Q6 AP EAPCET 2026 · 15 May · Shift 2 MCQ

The coefficient of performance of a refrigerator is 5. If the inside temperature of freezer is -20^0C, then the temperature of the surroundings to which it rejects heat is (approximately)

(A) 41^0C
(B) 11^0C
(C) 21^0C
(D) 31^0C

Answer: (D) 31^0C · The council's preliminary key

Q7 AP EAPCET 2026 · 14 May · Shift 1 MCQ

Two gases 'A' and 'B' are initially at same pressure, volume and temperature. If 'A' is compressed isothermally and 'B' adiabatically to half of the initial volume, then the final pressure of 'A' is

(A) greater than the final pressure of 'B'
(B) equal to the final pressure of 'B'
(C) less than the final pressure of 'B'
(D) twice the final pressure of 'B'

Answer: (C) less than the final pressure of 'B' · The council's preliminary key

Q8 AP EAPCET 2026 · 14 May · Shift 1 MCQ

Assertion (A): When 1 g of ice melts at constant temperature at a pressure of 1 atm, the increase in internal energy is greater than 80 cal (Latent heat of fusion of ice = 80 cal g^{-1})

Reason (R): During melting of ice, work is done on the ice

Choose the correct option from the following

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

Answer: (A) Both A and R are true. R is the correct explanation of A · The council's preliminary key

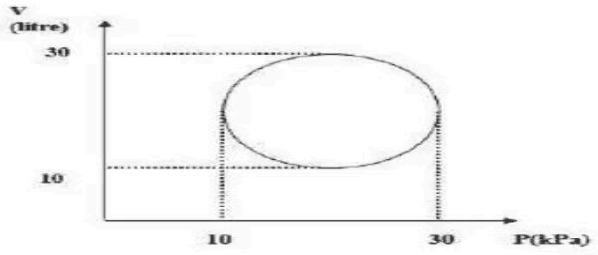
Q9 AP EAPCET 2026 · 14 May · Shift 2 MCQ

Heat energy absorbed by a system in going through a cyclic process shown in the figure is

(see the figure above)

Heat energy absorbed by a system in going through a cyclic process shown in the figure is

పటంలో చూపినట్లు చక్రీయ ప్రక్రియలో నున్న వ్యవస్థ శోషణ చేసుకునే ఉష్ణశక్తి ఎంత?



Options :

1. $10^{7}\pi$ J
2. $10^{4}\pi$ J
3. $10^{2}\pi$ J
4. $10^{-3}\pi$ J

(A) $10^{7}\pi$ J
(B) $10^{4}\pi$ J
(C) $10^{2}\pi$ J
(D) $10^{-3}\pi$ J

Answer: (C) $10^{2}\pi$ J · The council's preliminary key

Q10 AP EAPCET 2026 · 14 May · Shift 2 MCQ

The efficiency of Carnot engine is 50% and temperature of sink is 500 K. Keeping the source temperature constant, the required sink temperature to raise the efficiency of the engine to 60% is

(A) 100 K
(B) 400 K
(C) 500 K
(D) 600 K

Answer: (B) 400 K · The council's preliminary key

Q11 AP EAPCET 2026 · 13 May · Shift 1 MCQ

A Carnot engine of 50% efficiency takes heat from a source of 400 K. To change efficiency to 70% without changing the sink temperature, the new temperature of source should be (nearer to)

(A) 765 K
(B) 525 K
(C) 800 K
(D) 667 K

Answer: (D) 667 K · The council's preliminary key

Q12 AP EAPCET 2026 · 13 May · Shift 1 MCQ

In which of the following thermodynamic process, the internal energy of system remains constant

(A) Isobaric
(B) Isochoric
(C) Adiabatic
(D) Isothermal

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

Q13 AP EAPCET 2026 · 13 May · Shift 2 MCQ

An electric heater supplies heat to a system at a rate of 100 W. If system performs work at rate of 75 joules per second. The rate of increase of internal energy is

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(A) $175\ \mathrm{J\,s^{-1}}$
(B) $25\ \mathrm{J\,s^{-1}}$
(C) $-175\ \mathrm{J\,s^{-1}}$
(D) $-25\ \mathrm{J\,s^{-1}}$

Answer: (B) $25\ \mathrm{J\,s^{-1}}$ · The council's preliminary key

Q14 AP EAPCET 2026 · 13 May · Shift 2 MCQ

A Carnot heat engine receives 300 J of heat from the source and rejects 150 J to sink. If source and sink are at $227^{\circ}\mathrm{C}$ and T K, then T is

(A) 125 K
(B) 250 K
(C) 350 K
(D) 227 K

Answer: (B) 250 K · The council's preliminary key

Q15 AP EAPCET 2026 · 12 May · Shift 1 MCQ

Two moles of ideal gas undergo isothermal expansion from volume V to $2V$ at temperature T. The work done during the expansion is

(A) $nRT\ ln\ 2$
(B) $2RT\ ln\ 2$
(C) $RT\ ln\ 2$
(D) $2nRT\ ln\ 2$

Answer: (B) $2RT\ ln\ 2$ · The council's preliminary key

Q16 AP EAPCET 2026 · 12 May · Shift 2 MCQ

Equal amounts of a diatomic ideal gas are contained in two separate cylinders, P and Q. Cylinder P has a movable piston, while cylinder Q has a fixed piston. Both gases are initially at 273 K, and the same amount of heat is supplied to each. If the gas in cylinder P shows a temperature rise of 20 K, then the increase in temperature of the gas in cylinder Q is

(A) 38 K
(B) 20 K
(C) 42 K
(D) 28 K

Answer: (D) 28 K · The council's preliminary key

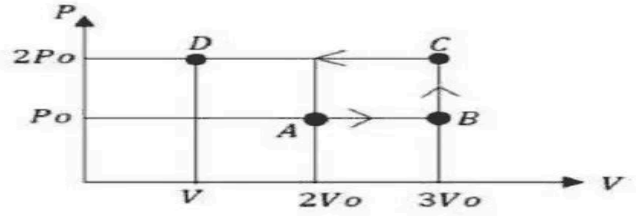
Q17 AP EAPCET 2026 · 12 May · Shift 2 MCQ

Using the $P-V$ diagram, the work done by ideal gas along the path $ABCD$

(see the figure above)

Using the $P-V$ diagram, the work done by ideal gas along the path $ABCD$

$P-V$ పటములో చూపిన విధముగా $ABCD$ పథము వెంబడి, ఒక ఆదర్శ వాయువు చేసిన పని



Options :

1. $4P_0V_0$
2. $3P_0V_0$
3. $-4P_0V_0$
4. $-3P_0V_0$

(A) $4P_0V_0$
(B) $3P_0V_0$
(C) $-4P_0V_0$
(D) $-3P_0V_0$

Answer: (D) $-3P_0V_0$ · The council's preliminary key

Q18 TS EAPCET 2026 · 11 May · Shift 1 MCQ

The temperatures of source and sink of a Carnot heat engine are $127\ ^\circ\mathrm{C}$ and $27\ ^\circ\mathrm{C}$ respectively. If the working substance of the engine is 2 moles of a rigid diatomic gas, then the decrease in the internal energy of the substance during adiabatic expansion process is
(Universal gas constant $= 8.31\ \mathrm{J\,mol^{-1}\,K^{-1}}$)

(A) 2493 J
(B) 4986 J
(C) 3324 J
(D) 4155 J

Answer: (D) 4155 J · The council's preliminary key

Q19 TS EAPCET 2026 · 11 May · Shift 2 MCQ

At a constant pressure of $2 \times 10^5\ \mathrm{N\,m^{-2}}$, if the volume of 4 moles of a monoatomic gas changes from 1000 cc to 1500 cc, then the change in internal energy of the gas is

(A) 150 J
(B) 250 J
(C) 200 J
(D) 600 J

Answer: (A) 150 J · The council's preliminary key

Q20 TS EAPCET 2026 · 10 May · Shift 1 MCQ

When 70 J of heat is supplied to a rigid diatomic gas at a constant pressure P, the change in the volume of the gas is ΔV. If the same amount of heat is supplied to a monoatomic gas at the same constant pressure P, then the change in volume of the monoatomic gas is

(A) $1.4\ \Delta V$
(B) $0.7\ \Delta V$
(C) $2.1\ \Delta V$
(D) $2.8\ \Delta V$

Answer: (A) $1.4\ \Delta V$ · The council's preliminary key

Q21 TS EAPCET 2026 · 10 May · Shift 2 MCQ

The intensive variables among thermodynamic state variables internal energy U, volume V, pressure P, absolute temperature T and total mass M are

(A) M, V
(B) U, M
(C) U, V
(D) P, T

Answer: (D) P, T · The council's preliminary key

Q22 TS EAPCET 2026 · 9 May · Shift 1 MCQ

At constant pressure, if equal amounts of heat are supplied to a monoatomic gas and a rigid diatomic gas, then the ratio of the changes in the internal energies of the monoatomic and diatomic gases is

(A) $3 : 5$
(B) $1 : 1$
(C) $21 : 25$
(D) $14 : 23$

Answer: (C) $21 : 25$ · The council's preliminary key

Q23 TS EAPCET 2026 · 9 May · Shift 2 MCQ

A Carnot's heat engine operates between the temperatures $33\ ^\circ\mathrm{C}$ and $133\ ^\circ\mathrm{C}$. The relation between the absolute temperature (T) and volume (V) of the working substance during adiabatic expansion is

$T\sqrt{V} =$ constant. The work done by 10 moles of the working substance during adiabatic expansion process is
(R – Universal gas constant)

(A) $500R$
(B) $1000R$
(C) $2000R$
(D) $1500R$

Answer: (C) $2000R$ · The council's preliminary key

Q24 AP EAPCET 2025 · 27 May · Shift 1 MCQ

The efficiency of a Carnot's heat engine is $\frac{1}{3}$. If the temperature of the source is decreased by $50\ ^\circ\mathrm{C}$ and the temperature of the sink is increased by $25\ ^\circ\mathrm{C}$, the efficiency of the engine becomes $\frac{3}{16}$. The initial temperature of the sink is

(A) $325\ \mathrm{K}$
(B) $375\ \mathrm{K}$
(C) $350\ \mathrm{K}$
(D) $300\ \mathrm{K}$

Answer: (D) $300\ \mathrm{K}$ · The council's preliminary key

Q25 AP EAPCET 2025 · 27 May · Shift 1 MCQ

The change in internal energy of given mass of a gas, when its volume changes from V to 3V at constant pressure P is
(γ - Ratio of the specific heat capacities of the gas)

(A) $\frac{PV}{\gamma - 1}$
(B) $\frac{2PV}{\gamma - 1}$
(C) $\frac{3PV}{\gamma - 1}$
(D) $\frac{PV}{2\gamma - 1}$

Answer: (B) $\frac{2PV}{\gamma - 1}$ · The council's preliminary key

Q26 AP EAPCET 2025 · 27 May · Shift 1 MCQ

A monatomic gas at a pressure of 100 kPa expands adiabatically such that its final volume becomes 8 times its initial volume. If the work done during the process is 180 J, then the initial volume of the gas is

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(A) $1600\ \mathrm{cm}^3$
(B) $800\ \mathrm{cm}^3$
(C) $1200\ \mathrm{cm}^3$
(D) $2000\ \mathrm{cm}^3$

Answer: (A) $1600\ \mathrm{cm}^3$ · The council's preliminary key

Q27 AP EAPCET 2025 · 26 May · Shift 1 MCQ

The ratio of the efficiencies of two Carnot engines A and B is 1.25 and the temperature difference between the source and the sink is same in both the engines. The ratio of the absolute temperature of the sources of the engines A and B is

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

Answer: (D) $4:5$ · The council's preliminary key

Q28 AP EAPCET 2025 · 26 May · Shift 1 MCQ

The heat supplied to a gas at a constant pressure of 5×10^5 Pa is 1000 kJ. If the volume of gas changes from $1\ \mathrm{m}^3$ to $2.5\ \mathrm{m}^3$, then the change in internal energy of the gas is

(A) 250 kJ
(B) 225 kJ
(C) 200 kJ
(D) 175 kJ

Answer: (A) 250 kJ · The council's preliminary key

Q29 AP EAPCET 2025 · 26 May · Shift 1 MCQ

When an ideal diatomic gas undergoes adiabatic expansion, if the increase in its volume is 0.5%, then the change in the pressure of the gas is

(A) $+0.5\%$
(B) -0.5%
(C) -0.7%
(D) $+0.7\%$

Answer: (C) -0.7% · The council's preliminary key

Q30 AP EAPCET 2025 · 26 May · Shift 2 MCQ

If 5.6 litres of a monoatomic gas at STP is adiabatically compressed to 0.7 litres, then the work done on the gas is nearly

(R - Universal gas constant)

(A) $307R$

(B) $357R$

(C) $367R$

(D) $407R$

Answer: (A) $307R$ · The council's preliminary key

Q31 AP EAPCET 2025 · 24 May · Shift 1 MCQ

When 80 J of heat is supplied to a gas at constant pressure, if the work done by the gas is 20 J, then the ratio of the specific heat capacities of the gas is

(A) $\frac{4}{3}$

(B) $\frac{5}{3}$

(C) $\frac{7}{5}$

(D) $\frac{9}{7}$

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

Q32 AP EAPCET 2025 · 24 May · Shift 1 MCQ

A refrigerator of coefficient of performance 5 that extracts heat from the cooling compartment at the rate of 250 J per cycle is placed in a room. The heat released per cycle to the room by the refrigerator is

(A) 250 J

(B) 50 J

(C) 200 J

(D) 300 J

Answer: (D) 300 J · The council's preliminary key

Q33 AP EAPCET 2025 · 23 May · Shift 1 MCQ

In a Carnot engine, if the work done during isothermal expansion is 25% more than the work done during isothermal compression, then the efficiency of the engine is

(A) 10%

(B) 15%

(C) 20%

(D) 25%

Answer: (C) 20% · The council's preliminary key

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Q34 AP EAPCET 2025 · 23 May · Shift 1 MCQ

The work done to increase the volume of 2 moles of an ideal gas from V to 2V at a constant temperature T is W. The work to be done to increase the volume of 2 moles of the same gas from 2V to 4V at the same constant temperature T is

(A) 0.5W
(B) W
(C) 2W
(D) 4W

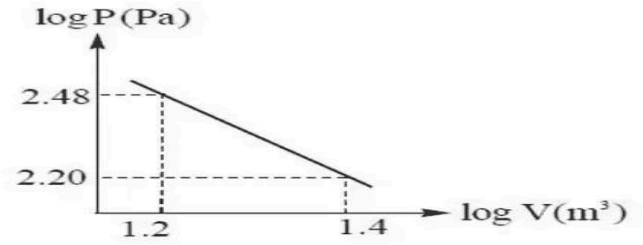
Answer: (B) W · The council's preliminary key

Q35 AP EAPCET 2025 · 23 May · Shift 1 MCQ

If the given graph shows the logarithmic values of pressure (P) and volume (V) of an ideal gas, then the ratio of the specific heat capacities of the gas is

(see the figure above)

If the given graph shows the logarithmic values of pressure (P) and volume (V) of an ideal gas, then the ratio of the specific heat capacities of the gas is
ఇవ్వబడిన గ్రాఫ్ ఒక ఆదర్శ వాయువు యొక్క పీడనం (P) మరియు ఘనపరిమాణం (V) ల సంవర్గమాన విలువలను సూచించిన, ఆ వాయువు యొక్క విశిష్టోష్ణ సామర్థ్యాల నిష్పత్తి



Options :
1. 1.5
2. 1.2
3. 1.4
4. 1.3

(A) 1.5
(B) 1.2
(C) 1.4
(D) 1.3

Answer: (C) 1.4 · The council's preliminary key

Q36 AP EAPCET 2025 · 23 May · Shift 2 MCQ

In a Carnot engine, if the absolute temperature of the source is 25% more than the absolute temperature of the sink, then the efficiency of the engine is

(A) 25%
(B) 50%
(C) 20%
(D) 40%

Answer: (C) 20% · The council's preliminary key

Q37 AP EAPCET 2025 · 23 May · Shift 2 MCQ

The work done by 6 moles of helium gas when its temperature increases by $20\,^{\circ}\mathrm{C}$ at constant pressure is

(Universal gas constant $= 8.31\ \mathrm{J\,mol^{-1}\,K^{-1}}$)

(A) $807.2\ \mathrm{J}$
(B) $887.2\ \mathrm{J}$
(C) $997.2\ \mathrm{J}$
(D) $1007.2\ \mathrm{J}$

Answer: (C) $997.2\ \mathrm{J}$ · The council's preliminary key

Q38 AP EAPCET 2025 · 23 May · Shift 2 MCQ

If a heat engine and a refrigerator are working between the same two temperatures T_1 and T_2 ($T_1 > T_2$), then the ratio of efficiency of heat engine to coefficient of performance of refrigerator is

(A) $\dfrac{(T_1 - T_2)}{T_1 T_2}$
(B) $\dfrac{(T_1 + T_2)}{T_1 T_2}$
(C) $\dfrac{(T_1 - T_2)^2}{T_1 T_2}$
(D) $\dfrac{(T_1 + T_2)^2}{T_1 T_2}$

Answer: (C) $\dfrac{(T_1 - T_2)^2}{T_1 T_2}$ · The council's preliminary key

Q39 AP EAPCET 2025 · 22 May · Shift 1 MCQ

A Carnot heat engine absorbs 600 J of heat from a source at a temperature of 127 °C and rejects 400 J of heat to a sink in each cycle. The temperature of the sink is

(A) 266.7 K
(B) 166.7 K
(C) 133.3 K
(D) 333.3 K

Answer: (A) 266.7 K · The council's preliminary key

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Q40 AP EAPCET 2025 · 22 May · Shift 1 MCQ

During adiabatic expansion, if the temperature of 3 moles of a diatomic gas decreases by $50\ ^{\circ}\mathrm{C}$, then the work done by the gas is

(R - Universal gas constant)

(A) $375R$
(B) $750R$
(C) $1500R$
(D) $825R$

Answer: (A) $375R$ · The council's preliminary key

Q41 AP EAPCET 2025 · 22 May · Shift 1 MCQ

The fundamental limitation to the coefficient of performance of a refrigerator is given by

(A) first law of thermodynamics
(B) Newton's law of cooling
(C) zeroth law of thermodynamics
(D) second law of thermodynamics

Answer: (D) second law of thermodynamics · The council's preliminary key

Q42 AP EAPCET 2025 · 22 May · Shift 2 MCQ

Water of mass $5\ \mathrm{kg}$ in a closed vessel is at a temperature of $20\ ^{\circ}\mathrm{C}$. If the temperature of the water when heated for a time of 10 minutes becomes $30\ ^{\circ}\mathrm{C}$, then the increase in the internal energy of the water is

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

(A) $100\ \mathrm{kJ}$
(B) $420\ \mathrm{kJ}$
(C) $510\ \mathrm{kJ}$
(D) $210\ \mathrm{kJ}$

Answer: (D) $210\ \mathrm{kJ}$ · The council's preliminary key

Q43 AP EAPCET 2025 · 22 May · Shift 2 MCQ

A Carnot engine A working between temperatures 600 K and T ($<$ 600 K) and another Carnot engine B working between temperatures T ($>$ 400 K) and 400 K are connected in series. If the work done by both the engines is same, then T =

(A) 550 K
(B) 500 K
(C) 575 K
(D) 525 K

Answer: (B) 500 K · The council's preliminary key

Q44 AP EAPCET 2025 · 22 May · Shift 2 MCQ

When an ideal diatomic gas is heated at constant pressure, the fraction of the heat utilised to increase the internal energy of the gas is

(A) $\frac{2}{5}$
(B) $\frac{3}{5}$
(C) $\frac{3}{7}$
(D) $\frac{5}{7}$

Answer: (D) $\frac{5}{7}$ · The council's preliminary key

Q45 AP EAPCET 2025 · 21 May · Shift 1 MCQ

According to zeroth law of thermodynamics, the physical quantity which is same for two bodies in thermal equilibrium is

(A) heat
(B) temperature
(C) volume
(D) pressure

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

Q46 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If a refrigerator of coefficient of performance of 5 has a freezer at a temperature of $-13\ ^{\circ}\mathrm{C}$, then the room temperature is

(A) $325\ ^{\circ}\mathrm{C}$
(B) $225\ ^{\circ}\mathrm{C}$
(C) $39\ ^{\circ}\mathrm{C}$
(D) $29\ ^{\circ}\mathrm{C}$

Answer: (C) $39\ ^{\circ}\mathrm{C}$ · The council's preliminary key

Q47 AP EAPCET 2025 · 21 May · Shift 1 MCQ

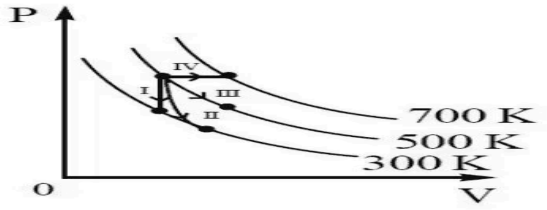
From the figure shown for a thermodynamic system, match the curves with their respective thermodynamic processes.
(P - Pressure and V - volume)

(see the figure above)

Curve	Process
I	a) Adiabatic
II	b) Isobaric
III	c) Isochoric
IV	d) Isothermal

From the figure shown for a thermodynamic system, match the curves with their respective thermodynamic processes.
(P - Pressure and V - volume)
ఒక ఉష్ణగతిక వ్యవస్థకు సంబంధించి పటంలో చూపిన వక్రాలను, వాటి ఉష్ణయాంత్రిక ప్రక్రియలతో జతపరుచుము.
(P - పీడనం మరియు V - ఘనపరిమాణం)

Curve వక్రం		Process ప్రక్రియ
I	a)	Adiabatic స్థిరోష్ణక
II	b)	Isobaric సమ పీడన
III	c)	Isochoric సమ ఘనపరిమాణ
IV	d)	Isothermal సమ ఉష్ణోగ్రత



Options :

1. I-c, II-a, III-d, IV-b
2. I-c, II-d, III-b, IV-a
3. I-d, II-b, III-a, IV-c
4. I-a, II-c, III-d, IV-b

(A) I-c, II-a, III-d, IV-b
(B) I-c, II-d, III-b, IV-a
(C) I-d, II-b, III-a, IV-c
(D) I-a, II-c, III-d, IV-b

Answer: (A) I-c, II-a, III-d, IV-b · The council's preliminary key

Q48 AP EAPCET 2025 · 21 May · Shift 2 MCQ

If a gas of volume 400 cc at an initial pressure P is suddenly compressed to 100 cc, then its final pressure is

(The ratio of the specific heat capacities of the gas at constant pressure and constant volume is 1.5)

(A) $\frac{P}{32}$
(B) $8P$
(C) $32P$
(D) $16P$

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

Q49 AP EAPCET 2025 · 21 May · Shift 2 MCQ

A Carnot engine having efficiency 60% receives heat from a source at a temperature 600 K. For the same sink temperature, to increase its efficiency to 80%, the temperature of the source is

(A) 300 K
(B) 900 K
(C) 1200 K
(D) 720 K

Answer: (C) 1200 K · The council's preliminary key

Q50 TS EAPCET 2025 · 4 May · Shift 1 MCQ

The ratio of the work done, change in internal energy and heat absorbed when a diatomic gas expands at constant pressure is

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

Answer: (D) $2:5:7$ · The council's preliminary key

Q51 TS EAPCET 2025 · 4 May · Shift 2 MCQ

A Carnot engine uses diatomic gas as a working substance. During the adiabatic expansion part of the cycle, if the volume of the gas becomes 32 times its initial volume, then the efficiency of the engine is

(A) 100 %
(B) 75 %
(C) 50 %
(D) 25 %

Answer: (B) 75 % · The council's preliminary key

Q52 TS EAPCET 2025 · 3 May · Shift 1 MCQ

The power of a refrigerator that can make 15 kg of ice at $0\ ^{\circ}\mathrm{C}$ from water at $30\ ^{\circ}\mathrm{C}$ in one hour is

(A) 6600 W
(B) 1925 W
(C) 2200 W
(D) 4620 W

Answer: (B) 1925 W · The council's preliminary key

Q53 TS EAPCET 2025 · 3 May · Shift 1 MCQ

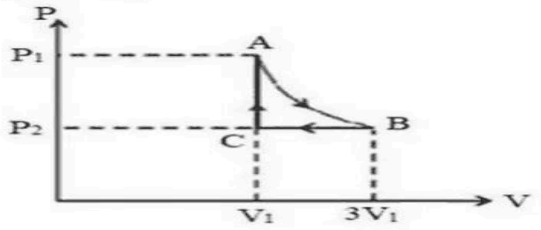
Three moles of an ideal gas undergoes a cyclic process ABCA as shown in the figure. The pressure, volume and absolute temperature at points A, B and C are respectively (P_1, V_1, T_1), $(P_2, 3V_1, T_1)$ and (P_2, V_1, T_2). Then the total work done in the cycle ABCA is (R- Universal gas constant).

(see the figure above)

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Three moles of an ideal gas undergoes a cyclic process ABCA as shown in the figure. The pressure, volume and absolute temperature at points A, B and C are respectively (P_1, V_1, T_1), (P_2, $3V_1$, T_1) and (P_2, V_1, T_2). Then the total work done in the cycle ABCA is (R- Universal gas constant).

3 మోలుల ఒక ఆదర్శ వాయువు పటములో చూపిన విధంగా ABCA అను చక్రీయ ప్రక్రియకు లోనైనది. ఈ ప్రక్రియలో A, B మరియు C బిందువుల వద్ద పీడనం, ఘనపరిమాణం మరియు పరమ ఉష్ణోగ్రతలు వరుసగా (P_1, V_1, T_1), (P_2, $3V_1$, T_1) మరియు (P_2, V_1, T_2). ఈ ABCA చక్రీయ ప్రక్రియలో జరిగిన మొత్తం పని (R-సార్వత్రిక వాయు స్థిరాంకం)



Options :

1. $RT_1[3\ln(3)+2]$
2. $RT_1[3\ln(2)]$
3. $3RT_1(\ln 3)$
4. $RT_1[3\ln(3)-2]$

(A) $RT_1[3\ln(3)+2]$

(B) $RT_1[3\ln(2)]$

(C) $3RT_1(\ln 3)$

(D) $RT_1[3\ln(3)-2]$

Answer: (D) $RT_1[3\ln(3)-2]$ · The council's preliminary key

Q54 TS EAPCET 2025 · 3 May · Shift 2 MCQ

At constant pressure, equal amounts of heat are supplied to a monatomic gas and a diatomic gas separately. The ratio of the increases in internal energies of the two gases is

(A) $1:1$

(B) $9:49$

(C) $3:7$

(D) $21:25$

Answer: (D) $21:25$ · The council's preliminary key

Q55 TS EAPCET 2025 · 2 May · Shift 1 MCQ

Two moles of a gas at a temperature of $327\ ^{\circ}\mathrm{C}$ expands adiabatically such that its volume increases by 700%. If the ratio of the specific heat capacities of the gas is $\frac{4}{3}$, then the work done by the gas is (Universal gas constant $= 8.3\,\mathrm{J\,mol^{-1}\,K^{-1}}$)

(A) 14.94 kJ
(B) 29.88 kJ
(C) 44.82 kJ
(D) 59.76 kJ

Answer: (A) 14.94 kJ · The council's preliminary key

Q56 TS EAPCET 2025 · 2 May · Shift 2 MCQ

A gas is suddenly compressed such that its absolute temperature is doubled. If the ratio of the specific heat capacities of the gas is 1.5, then the percentage decrease in the volume of the gas is

(A) 30
(B) 50
(C) 25
(D) 75

Answer: (D) 75 · The council's preliminary key

Q57 AP EAPCET 2024 · 23 May · Shift 1 MCQ

When 2 moles of a monatomic gas expands adiabatically from a temperature of $80^{\circ}\mathrm{C}$ to $50^{\circ}\mathrm{C}$, the work done is W. The work done when 3 moles of a diatomic gas expands adiabatically from $50^{\circ}\mathrm{C}$ to $20^{\circ}\mathrm{C}$, is

(A) 7 W
(B) 5 W
(C) 2.5 W
(D) 3.5 W

Answer: (C) 2.5 W · The council's preliminary key

Q58 AP EAPCET 2024 · 23 May · Shift 1 MCQ

A gas absorbs 18 J of heat and work done on the gas is 12 J. Then the change in internal energy of the gas

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(A) 24 J
(B) 36 J
(C) 6 J
(D) 30 J

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

Q59 AP EAPCET 2024 · 23 May · Shift 1 MCQ

If the ratio of the absolute temperature of the sink and source of a Carnot engine is changed from $2:3$ to $3:4$, the efficiency of the engine changes by

(A) 25%
(B) 40%
(C) 50%
(D) 15%

Answer: (A) 25% · The council's preliminary key

Q60 AP EAPCET 2024 · 22 May · Shift 1 MCQ

The efficiency of a heat engine that works between the temperatures where Celsius-Fahrenheit scales coincides and Kelvin-Fahrenheit scales coincides is (approximately)

(A) 45%
(B) 35%
(C) 60%
(D) 50%

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

Q61 AP EAPCET 2024 · 22 May · Shift 1 MCQ

Initially the pressure of 1 mole of an ideal gas is $10^5\ \mathrm{Nm}^{-2}$ and its volume is 16 litre. When it is adiabatically compressed, its final volume is 2 litre. Work done on the gas is [molar specific heat at constant volume $= \frac{3R}{2}$]

(A) 72 kJ
(B) 7.2 kJ
(C) 720 kJ
(D) 360 kJ

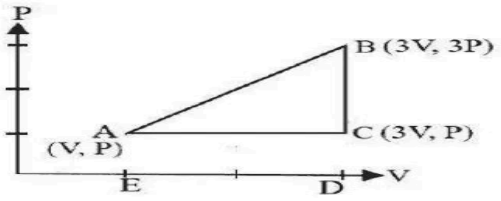
Answer: (B) 7.2 kJ · The council's preliminary key

Q62 AP EAPCET 2024 · 22 May · Shift 1 MCQ

An ideal gas is taken around ABCA as shown in the P-V diagram. The work done during a cycle is

(see the figure above)

An ideal gas is taken around ABCA as shown in the P-V diagram. The work done during a cycle is
ఒక ఆదర్శ వాయువు ను క్రింది P-V పటంలో చూపినట్లు ABCA చక్రీయ ప్రక్రియకు గురిచేయడానికి చేయవలసిన పని ఎంత?



Options :

1. 2PV
2. PV
3. $\frac{1}{2}$ PV
4. Zero
సున్న

(A) 2PV
(B) PV
(C) $\frac{1}{2}$PV
(D) Zero

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

Q63 AP EAPCET 2024 · 22 May · Shift 2 MCQ

Two ideal gases A and B of same number of moles expand at constant temperatures T_1 and T_2 respectively such that the pressure of gas A decreases by 50 % and the pressure of gas B decreases by 75 %. If the work done by both the gases is same, then $T_1 : T_2$

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

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

Q64 AP EAPCET 2024 · 22 May · Shift 2 MCQ

When 80 J of heat is absorbed by a monotonic gas, its volume increases by $16 \times 10^{-5}\ \mathrm{m}^3$. The pressure of the gas is

(A) $2 \times 10^5\ \mathrm{Nm}^{-2}$
(B) $4 \times 10^5\ \mathrm{Nm}^{-2}$
(C) $6 \times 10^5\ \mathrm{Nm}^{-2}$
(D) $5 \times 10^5\ \mathrm{Nm}^{-2}$

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

Q65 AP EAPCET 2024 · 22 May · Shift 2 MCQ

The efficiency of a Carnot heat engine is $25\ \%$ and the temperature of its source is $127\ ^{\circ}\mathrm{C}$. Without changing the temperature of the source, if absolute temperature of the sink is decreased by $10\ \%$, the efficiency of the engine is

(A) $27.5\ \%$
(B) $17.5\ \%$
(C) $32.5\ \%$
(D) $22.5\ \%$

Answer: (C) $32.5\ \%$ · The council's preliminary key

Q66 AP EAPCET 2024 · 21 May · Shift 1 MCQ

In a Carnot engine, when the temperatures are $T_2 = 0^{\circ}C$ and $T_1 = 200^{\circ}C$, its efficiency is η_1 and when the temperatures are $T_1 = 0^{\circ}C$ and $T_2 = -200^{\circ}C$, its efficiency is η_2. Then the value of $\frac{\eta_1}{\eta_2}$ is

(A) 0.58
(B) 0.73
(C) 0.64
(D) 0.42

Answer: (A) 0.58 · The council's preliminary key

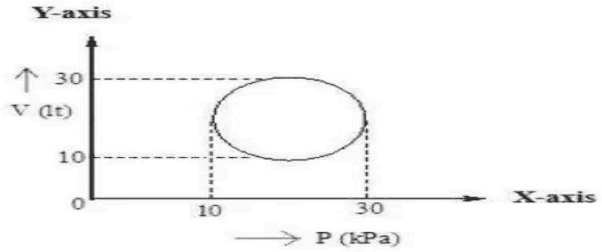
Q67 AP EAPCET 2024 · 21 May · Shift 1 MCQ

Heat energy absorbed by a system going through the cyclic process shown in the figure is

(see the figure above)

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Heat energy absorbed by a system going through the cyclic process shown in the figure is
పటంలో చూపిన విధంగా చక్రీయ ప్రక్రియకు ఒక వ్యవస్థను గురిచేస్తే, అది శోషణం చేసుకునే ఉష్ణ శక్తి



Options :

1. $10^7\pi$ J
2. $10^4\pi$ J
3. $10^2\pi$ J
4. $10^{-3}\pi$ J

(A) $10^7\pi$ J
(B) $10^4\pi$ J
(C) $10^2\pi$ J
(D) $10^{-3}\pi$ J

Answer: (C) $10^2\pi$ J · The council's preliminary key

Q68 AP EAPCET 2024 · 21 May · Shift 2 MCQ

An ideal gas is found to obey $PV^{\frac{3}{2}}$ = constant during an adiabatic process. If such a gas initially at a temperature T is adiabatically compressed to $\frac{1}{4}^{th}$ of its volume, then its final temperature is

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

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

Q69 AP EAPCET 2024 · 21 May · Shift 2 MCQ

The condition $dw = dq$ holds good in the following process

(A) Adiabatic process
(B) Isothermal process
(C) Isochoric process
(D) Isobaric process

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

Q70 AP EAPCET 2024 · 21 May · Shift 2 MCQ

The efficiency of a Carnot engine found to increase from 25% to 40% on increasing the temperature (T_1) of source alone through 100 K. The temperature (T_2) of the sink is given by

(A) 300 K
(B) 250 K
(C) 325 K
(D) 125 K

Answer: (A) 300 K · The council's preliminary key

Q71 AP EAPCET 2024 · 20 May · Shift 1 MCQ

The efficiency of a Carnot cycle is $\frac{1}{6}$. By lowering the temperature of sink by 65 K, it increases to $\frac{1}{3}$. The initial and final temperature of the sink are

(A) 400 K, 310 K
(B) 525 K, 65 K
(C) 309 K, 235 K
(D) 325 K, 260 K

Answer: (D) 325 K, 260 K · The council's preliminary key

Q72 AP EAPCET 2024 · 20 May · Shift 1 MCQ

In a cold storage, ice melts at the rate of 2 kg per hour when the external temperature is 20 °C. The minimum power output of the motor used to drive the refrigerator which just prevents the ice from melting is (latent heat of fusion of ice = 80 cal g^{-1})

(A) 28.5 W
(B) 13.6 W
(C) 9.75 W
(D) 16.4 W

Answer: (B) 13.6 W · The council's preliminary key

Q73 AP EAPCET 2024 · 20 May · Shift 1 MCQ

A Carnot engine has the same efficiency between 800 K and 500 K, and x > 600 K and 600 K. The value of 'x' is

(A) 1000 K
(B) 960 K
(C) 846 K
(D) 754 K

Answer: (B) 960 K · The council's preliminary key

Q74 AP EAPCET 2024 · 20 May · Shift 2 MCQ

A certain volume of a gas at 300 K expands adiabatically until its volume is doubled. The resultant fall in temperature of the gas is nearly (The ratio of the specific heats of the gas = 1.5)

(A) 88 K
(B) 77 K
(C) 67 K
(D) 54 K

Answer: (A) 88 K · The council's preliminary key

Q75 AP EAPCET 2024 · 20 May · Shift 2 MCQ

The efficiency of a Carnot's engine is 25%, when the temperature of sink is 300 K. The increase in the temperature of source required for the efficiency to become 50% is

(A) 225 K
(B) 400 K
(C) 200 K
(D) 100 K

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

Q76 AP EAPCET 2024 · 20 May · Shift 2 MCQ

When 100 J of heat is supplied to a gas, the increase in the internal energy of the gas is 60 J. Then the gas is/can

(A) be triatomic or diatomic gas
(B) Triatomic gas
(C) Monoatomic gas
(D) Diatomic gas

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

Q77 AP EAPCET 2024 · 19 May · Shift 2 MCQ

An ideal heat engine operates in Carnot cycle between 127 °C and 27 °C. It absorbs 5×10^4 cal of heat at higher temperature. Amount of heat converted to work is

(A) 4.8×10^4 cal
(B) 2.4×10^4 cal
(C) 1.25×10^4 cal
(D) 6×10^4 cal

Answer: (C) 1.25×10^4 cal · The council's preliminary key

Q78 AP EAPCET 2024 · 19 May · Shift 2 MCQ

A Carnot heat engine has an efficiency of 10 %. If the same engine is worked backward to obtain a refrigerator, then the coefficient of performance of the refrigerator is

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

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

Q79 AP EAPCET 2024 · 18 May · Shift 1 MCQ

The work done by an ideal gas of 2 moles in increasing its volume from V to 2V at constant temperature T is W. The work done by an ideal gas of 4 moles in increasing its volume from V to 8V at constant temperature $\frac{T}{2}$ is

(A) W
(B) 2W
(C) 3W
(D) 4W

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

Q80 AP EAPCET 2024 · 18 May · Shift 1 MCQ

When 40 J of heat is absorbed by a monatomic gas, the increase in the internal energy of the gas is

(A) 12 J
(B) 16 J
(C) 24 J
(D) 32 J

Answer: (C) 24 J · The council's preliminary key

Q81 AP EAPCET 2024 · 18 May · Shift 1 MCQ

In a Carnot engine, the absolute temperature of the source is 25% more than the absolute temperature of the sink. The efficiency of the engine is

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

Answer: (D) 20% · The council's preliminary key

Q82 TS EAPCET 2024 · 11 May · Shift 1 MCQ

For a gas in a thermodynamic process, the relation between internal energy (U), the pressure (P) and the volume (V) is $U = 3 + 1.5PV$. The ratio of the specific heat capacities of the gas at constant volume and constant pressure is

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

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

Q83 TS EAPCET 2024 · 10 May · Shift 1 MCQ

The ratio of the specific heat capacities of a gas is 1.5. When the gas undergoes an adiabatic process, its volume is doubled and pressure becomes P_1. When the gas undergoes isothermal process, its volume is doubled and pressure becomes P_2. If $P_1 = P_2$, the ratio of the initial pressures of the gas when it undergoes adiabatic and isothermal processes is

(A) $\sqrt{3} : \sqrt{2}$
(B) $1 : 1$
(C) $\sqrt{3} : 1$
(D) $\sqrt{2} : 1$

Answer: (D) $\sqrt{2} : 1$ · The council's preliminary key

Q84 TS EAPCET 2024 · 10 May · Shift 2 MCQ

When Q_1 amount of heat is supplied to a monatomic gas, the work done by the gas is W. When Q_2 amount of heat is supplied to a diatomic gas, the work done by the gas is 2W. Then $Q_1 : Q_2 =$

(A) $2 : 3$
(B) $3 : 5$
(C) $5 : 7$
(D) $5 : 14$

Answer: (D) $5 : 14$ · The council's preliminary key

Q85 TS EAPCET 2024 · 9 May · Shift 1 MCQ

The efficiency of a reversible heat engine working between two temperatures is 50%. The coefficient of performance of a refrigerator working between the same two temperatures but in reverse direction is

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

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

Q86 TS EAPCET 2024 · 9 May · Shift 2 MCQ

If dQ, dU and dW are heat energy absorbed, change in internal energy and external work done respectively by a diatomic gas at constant pressure, then dW : dU : dQ is

(A) 5:3:2
(B) 7:5:2
(C) 4:3:1
(D) 2:5:7

Answer: (D) 2:5:7 · The council's preliminary key

Q87 AP EAPCET 2023 · 19 May · Shift 1 MCQ

The change in internal energy when 20 g of a gas is heated from $25\ ^{\circ}\mathrm{C}$ to $35\ ^{\circ}\mathrm{C}$ at constant volume is (Specific heat capacity of the gas at constant volume = $0.2\ \mathrm{cal\ g^{-1}\ ^{\circ}C^{-1}}$ and J = 4200 J /kcal).

(A) 74 J
(B) 336 J
(C) 136 J
(D) 168 J

Answer: (D) 168 J · The council's preliminary key

Q88 AP EAPCET 2023 · 19 May · Shift 1 MCQ

A gas of mass 'm' and molecular weight 'M' is flowing in an insulated tube with a velocity '2V'. If the flow of the gas is suddenly stopped and all the kinetic energy is utilized to compress the gas, the increase in the temperature of the gas is

(γ is ratio of specific heats, R is universal gas constant)

(A) $\frac{2MV^2(\gamma-1)}{R}$
(B) $\frac{mV^2(\gamma-1)}{2MR}$
(C) $\frac{mV^2\gamma}{2R}$
(D) $\frac{MV^2\gamma}{2R}$

Answer: (A) $\frac{2MV^2(\gamma-1)}{R}$ · The council's preliminary key

Q89 AP EAPCET 2023 · 18 May · Shift 1 MCQ

In a thermodynamic process if 'ΔW' and 'ΔU' are the work done and change in the internal energy of a system respectively, then

(A) $\Delta U = \Delta W$ in adiabatic process
(B) $\Delta U = \Delta W$ in isothermal process
(C) $\Delta U = -\Delta W$ in isothermal process
(D) $\Delta U = -\Delta W$ in adiabatic process

Answer: (D) $\Delta U = -\Delta W$ **in adiabatic process** · The council's preliminary key

Q90 AP EAPCET 2023 · 18 May · Shift 1 MCQ

A gas is expanded from an initial state to a final state along a path that consists of (a) an isothermal expansion doing 40 J work, (b) an adiabatic expansion doing W work, (c) an isothermal expansion doing 30 J work. If the total change in the internal energy of the gas is − 20 J, the work done by the gas during the adiabatic expansion W =

(A) 50 J
(B) 90 J
(C) 70 J
(D) 20 J

Answer: (D) 20 J · The council's preliminary key

Q91 AP EAPCET 2023 · 18 May · Shift 2 MCQ

The relation between volume (V) and absolute temperature (T) of a gas in an adiabatic process is

(A) $TV^{\gamma} = \text{constant}$
(B) $VT^{\gamma} = \text{constant}$
(C) $TV^{1-\gamma} = \text{constant}$
(D) $TV^{\gamma-1} = \text{constant}$

Answer: (D) $TV^{\gamma-1} = \text{constant}$ · The council's preliminary key

Q92 AP EAPCET 2023 · 18 May · Shift 2 MCQ

A diatomic gas has an initial internal energy of 80 cal. A work of 18 cal is done on the gas and the gas releases heat energy of 42 J. The final internal energy of the gas is

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(A) 20 J
(B) 369.6 J
(C) 54 J
(D) 20 cal

Answer: (B) 369.6 J · The council's preliminary key

Q93 AP EAPCET 2023 · 18 May · Shift 2 MCQ

Three moles of a gas at a temperature 'T' is heated to thrice its volume by keeping the pressure constant. If 'γ' is the ratio of specific heats, then the increase in internal energy of the gas is

(A) $\frac{3RT}{\gamma-1}$
(B) $\frac{6RT}{\gamma-1}$
(C) $\frac{8R}{\gamma-1}$
(D) $\frac{3R}{2(\gamma-1)}$

Answer: (B) $\frac{6RT}{\gamma-1}$ · The council's preliminary key

Q94 AP EAPCET 2023 · 17 May · Shift 1 MCQ

A work of 166.28 J is done to adiabatically compress one mole of a gas. If the increase in the temperature of the gas is 8 °C, the gas is

$(R = 8.314\ \text{J mol}^{-1}\ \text{K}^{-1})$

(A) monatomic
(B) diatomic
(C) polyatomic
(D) mixture of diatomic and polyatomic

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

Q95 AP EAPCET 2023 · 17 May · Shift 1 MCQ

In a Carnot's engine, as the gas absorbs heat energy from the source, then the temperature of the source

(A) decreases
(B) increases
(C) remains constant
(D) becomes zero

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

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Q96 AP EAPCET 2023 · 17 May · Shift 2 MCQ

In a Carnot's engine if the temperatures of the source and the sink are decreased by 100 K each then the efficiency of the engine

(A) increases
(B) decreases
(C) remains constant
(D) becomes one

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

Q97 AP EAPCET 2023 · 17 May · Shift 2 MCQ

The relation between absolute temperature (T) and pressure (P) of a gas in an adiabatic process is

(A) $P^{\gamma}T^{1-\gamma} = \text{constant}$
(B) $P^{1-\gamma}T^{\gamma} = \text{constant}$
(C) $P^{\gamma-1}T^{\gamma} = \text{constant}$
(D) $P^{\gamma}T^{\gamma-1} = \text{constant}$

Answer: (B) $P^{1-\gamma}T^{\gamma} = \text{constant}$ · The council's preliminary key

Q98 AP EAPCET 2023 · 16 May · Shift 1 MCQ

When a monatomic gas expands at constant pressure, the percentages of heat supplied that is used to do external work and to increase its internal energy are respectively

(A) 40, 60
(B) 25, 75
(C) 60, 40
(D) 75, 25

Answer: (A) 40, 60 · The council's preliminary key

Q99 AP EAPCET 2023 · 16 May · Shift 1 MCQ

The heat energy supplied to a diatomic gas at constant pressure is 210 J, then the work done by the gas is

(A) 60 J
(B) 150 J
(C) 90 J
(D) 210 J

Answer: (A) 60 J · The council's preliminary key

Q100 AP EAPCET 2023 · 16 May · Shift 1 MCQ

A monatomic gas at 630 K expands adiabatically to 27 times its initial volume. The final temperature of the gas is

(A) 30 K
(B) 130 K
(C) 170 K
(D) 70 K

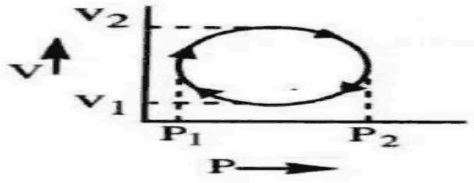
Answer: (D) 70 K · The council's preliminary key

Q101 AP EAPCET 2023 · 16 May · Shift 2 MCQ

In the cyclic process given in the P-V diagram, the work done is

(see the figure above)

In the cyclic process given in the P-V diagram, the work done is
P-V రేఖాచిత్రంలో ఇవ్వబడిన చక్రీయ ప్రక్రియలో, చేసిన పని



Options :

1. $\pi\left(\frac{P_2 - P_1}{2}\right)^2$
2. $\pi\left(\frac{V_2 - V_1}{2}\right)^2$
3. $\pi(P_2V_2 - P_1V_1)$
4. $\frac{\pi}{4}(P_2 - P_1)(V_2 - V_1)$

(A) $\pi\left(\frac{P_2-P_1}{2}\right)^2$
(B) $\pi\left(\frac{V_2-V_1}{2}\right)^2$
(C) $\pi(P_2V_2 - P_1V_1)$
(D) $\frac{\pi}{4}(P_2 - P_1)(V_2 - V_1)$

Answer: (D) $\frac{\pi}{4}(P_2 - P_1)(V_2 - V_1)$ · The council's preliminary key

Q102 AP EAPCET 2023 · 16 May · Shift 2 MCQ

In a Carnot's engine, as the gas gives heat energy to the sink, then the temperature of the sink

(A) increases
(B) decreases
(C) remains constant
(D) becomes zero

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

Q103 AP EAPCET 2023 · 16 May · Shift 2 MCQ

The work done by a gas is maximum when it expands from a volume V_1 to V_2, then the expansion is

(A) Isothermal expansion
(B) Adiabatic expansion
(C) Isobaric expansion
(D) Free expansion

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

Q104 AP EAPCET 2023 · 15 May · Shift 1 MCQ

2 moles of a monatomic gas requires heat energy Q to be heated from $30\ ^\circ\mathrm{C}$ to $40\ ^\circ\mathrm{C}$ at constant volume. The heat energy required to raise the temperature of 4 moles of a diatomic gas from $28\ ^\circ\mathrm{C}$ to $33\ ^\circ\mathrm{C}$ at constant volume is

(A) $2Q$
(B) $\frac{7Q}{2}$
(C) $\frac{4Q}{3}$
(D) $\frac{5Q}{3}$

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

Q105 AP EAPCET 2023 · 15 May · Shift 2 MCQ

The temperature of the sink of a Carnot's engine is 300 K and the efficiency of the engine is 0.25. If the temperature of the source of the engine is increased by 100 K, the efficiency of the engine increases by

(A) 0.50
(B) 0.25
(C) 0.15
(D) 0.40

Answer: (C) 0.15 · The council's preliminary key

Q106 AP EAPCET 2023 · 15 May · Shift 2 MCQ

A monatomic gas of volume 'V' and pressure 'P' expands isothermally to a volume '27V' and then compressed adiabatically to a volume 'V'. The final pressure of the gas is

(A) 3P
(B) 2P
(C) 9P
(D) 4P

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

Q107 TS EAMCET 2023 · 14 May · Shift 1 MCQ

In a process, the work done by the system is equal to the decrease in its internal energy. The process that the system undergoes is

(A) isothermal process
(B) adiabatic process
(C) isobaric process
(D) isochoric process

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

Q108 TS EAMCET 2023 · 14 May · Shift 2 MCQ

Two moles of a triatomic gas $\left(\gamma = \frac{4}{3}\right)$ at temperature $327^{\circ}\mathrm{C}$ expands adiabatically such that its volume becomes 8 times its initial volume. Later the temperature of the gas is doubled in an isochoric process. The total work done in the two processes is
(R – universal gas constant)

(A) $900\ R$
(B) $1800\ R$
(C) $1200\ R$
(D) $300\ R$

Answer: (B) $1800\ R$ · The council's preliminary key

Q109 TS EAMCET 2023 · 13 May · Shift 1 MCQ

Two identical containers A and B with frictionless pistons contain the same ideal gas at the same temperature and same volume V. The mass of the gas in A is m_A and that in B is m_B. The gas in each cylinder is now allowed to expand isothermally to the same final volume 2V. The changes in the pressures of the gases in A and B are found to be $2\Delta P$ and $3\Delta P$ respectively. Then the relation between m_A and m_B is

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(A) $3m_A = 4m_B$
(B) $3m_A = 2m_B$
(C) $2m_A = 3m_B$
(D) $4m_A = 3m_B$

Answer: (B) $3m_A = 2m_B$ · The council's preliminary key

Q110 TS EAMCET 2023 · 13 May · Shift 2 MCQ

When some amount of heat energy is supplied to a monatomic gas, the percentage of heat energy used for increasing the internal energy of the gas ($\gamma = 5/3$) is

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

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

Q111 TS EAMCET 2023 · 12 May · Shift 1 MCQ

The percentage of heat supplied to a diatomic ideal gas that is converted into work in an isobaric process is

(A) 62.7
(B) 71.4
(C) 28.6
(D) 34.6

Answer: (C) 28.6 · The council's preliminary key

Q112 TS EAMCET 2023 · 12 May · Shift 2 MCQ

An ideal gas at $127\ ^\circ\mathrm{C}$ is compressed suddenly to $\frac{8}{27}$ of its initial volume. If $\gamma = \frac{5}{3}$ for an ideal gas, then rise in its temperature is

(A) 450 K
(B) 500 K
(C) 225 K
(D) 405 K

Answer: (B) 500 K · The council's preliminary key

Q113 TS EAMCET 2023 · 12 May · Shift 2 MCQ

An insulating cylinder contains 4 moles of an ideal diatomic gas. When a heat Q is supplied to it, 2 moles of the gas molecules dissociate. If the temperature of the gas remains constant, then the value of Q is

(R – universal gas constant)

(A) $2RT$

(B) RT

(C) $3RT$

(D) $4RT$

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

Q114 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

Assertion (A): The zeroth law of thermodynamics leads to the concept of temperature.
Reason (R) : The zeroth law states that two systems in thermal equilibrium with a third system are in thermal equilibrium with each other.
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: (A) (A) is true, (R) is true and (R) is the correct explanation for (A) · The council's preliminary key

Q115 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

When a gas expands adiabatically, its volume is doubled while its absolute temperature is decreased by a factor of 2. The value of the adiabatic constant is

(A) 1

(B) 5/3

(C) 2

(D) 7/5

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

Q116 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

An amount of 700 J of heat is transferred to a diatomic gas allowing it to expand with the pressure held constant. The work done on the gas is

(A) 200 J

(B) 100 J

(C) 300 J

(D) 500 J

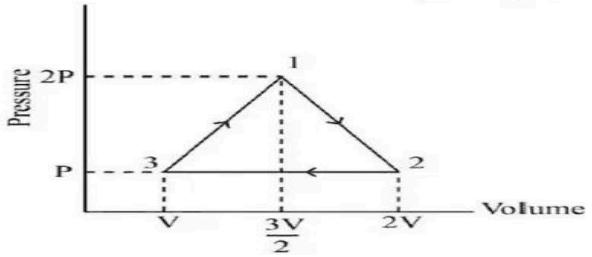
Answer: (A) 200 J · The council's preliminary key

Q117 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

A gas system is taken through the thermodynamic cyclic process $1 \rightarrow 2 \rightarrow 3 \rightarrow 1$ as shown below. The amount of heat released by the system is

(see the figure above)

A gas system is taken through the thermodynamic cyclic process $1 \rightarrow 2 \rightarrow 3 \rightarrow 1$ as shown below. The amount of heat released by the system is



Options :

1. $-P\frac{V}{2}$
2. PV
3. $\frac{PV}{2}$
4. $\frac{-3PV}{2}$

(A) $-P\frac{V}{2}$

(B) PV

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

(D) $\frac{-3PV}{2}$

Answer: (A) $-P\frac{V}{2}$ · The council's preliminary key

Q118 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

An ideal gas at pressure P is enclosed in a container that is placed in a reservoir at temperature T. If the volume of the gas is increased to two times its original value, then the new pressure $P' =$ _____ P

(A) $\frac{1}{2}$

(B) 2

(C) 1

(D) Cannot be determined

Answer: (A) $\frac{1}{2}$ · The council's preliminary key

Q119 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

A quantity of monoatomic gas undergoes a process in which pressure is changed linearly with volume. The pressure and volume are changed from initial value ($\mathrm{P_o}$, $\mathrm{V_o}$) to final value ($3\mathrm{P_o}$, $3\mathrm{V_o}$). The heat absorbed by the gas during the process is

(A) $8\ \mathrm{P_oV_o}$
(B) $12\ \mathrm{P_oV_o}$
(C) $16\ \mathrm{P_oV_o}$
(D) $20\ \mathrm{P_oV_o}$

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

Q120 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

An ideal gas having initial pressure P, volume V and temperature T is allowed to expand adiabatically until its volume becomes 4V, while its temperature falls to $\frac{T}{2}$. If the work done by the gas during the expansion is αPV, the value of α is

(A) 1.25
(B) 1.0
(C) 1.50
(D) 2.0

Answer: (B) 1.0 · The council's preliminary key

Q121 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

Assertion(A) : Heat and work are modes of energy transfer to a system resulting in change in its internal energy.
Reason(R) : Heat and work in thermodynamics are state variables.
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 · The council's preliminary key

Q122 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

An ideal gas at pressure P_0 undergoes an isothermal expansion until its volume is 8.0 times its initial volume. The gas is slowly and adiabatically compressed back to its original volume. If the adiabatic constant of the gas is $\gamma = 4/3$, then the ratio of the average kinetic energy per molecule in this final state to that in the initial state is

(A) 1.44
(B) 1.68
(C) 2.0
(D) 1.2

Answer: (C) 2.0 · The council's preliminary key

Q123 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

1.00 kg of liquid water at $100\ ^{\circ}\mathrm{C}$ undergoes a phase change into steam at $100\ ^{\circ}\mathrm{C}$ at 1.0 atm (take it to be 1.00×10^{5} Pa). The initial volume of the liquid water was $1.00 \times 10^{-3}\ \mathrm{m}^3$ which is changed to $2.001\ \mathrm{m}^3$ of steam. Find the change in the internal energy of the system.
[Use heat of vaporization $\simeq 2000\ \mathrm{kJ/kg}$]

(A) $1800\ \mathrm{kJ}$
(B) $200\ \mathrm{kJ}$
(C) $2000\ \mathrm{kJ}$
(D) $180\ \mathrm{kJ}$

Answer: (A) $1800\ \mathrm{kJ}$ · The council's preliminary key

Q124 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

A monoatomic gas does 100 J of work when it is expanded isobarically. How much of heat is given to the gas in the process

(A) $150\ \mathrm{J}$
(B) $200\ \mathrm{J}$
(C) $250\ \mathrm{J}$
(D) $300\ \mathrm{J}$

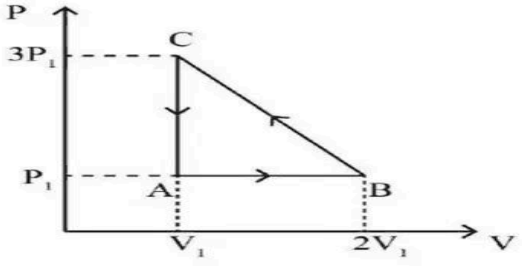
Answer: (C) $250\ \mathrm{J}$ · The council's preliminary key

Q125 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

The net work done by an ideal gas going through the cycle as shown in the P – V diagram below is
(see the figure above)

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The net work done by an ideal gas going through the cycle as shown in the P – V diagram below is



Options :

1. 0
2. P_1V_1
3. $\frac{3}{2}P_1V_1$
4. $\frac{1}{2}P_1V_1$

(A) 0
(B) P_1V_1
(C) $\frac{3}{2}P_1V_1$
(D) $\frac{1}{2}P_1V_1$

Answer: (B) P_1V_1 · The council's preliminary key

Q126 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

A diatomic gas $\left(C_P = \frac{7}{2}R\right)$ does 200 J of work when it is expanded isobarically. The heat given to the gas in the process is

(A) 600 J
(B) 800 J
(C) 900 J
(D) 700 J

Answer: (D) 700 J · The council's preliminary key

Q127 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

Temperature of a cold reservoir of a Carnot engine is $127\ ^\circ\text{C}$. If the efficiency of the Carnot engine is 20%, then the temperature of the hot reservoir is

(A) $500\ ^\circ\mathrm{C}$
(B) $227\ ^\circ\mathrm{C}$
(C) $273\ ^\circ\mathrm{C}$
(D) $400\ ^\circ\mathrm{C}$

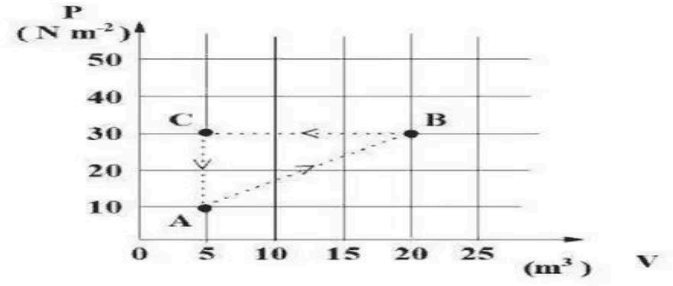
Answer: (B) $227\ ^\circ\mathrm{C}$ · The council's preliminary key

Q128 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

A gas in a closed container undergoes the cycle ABCA as shown in the figure. The net heat absorbed by the gas after it has completed 10 cycles is
(see the figure above)

A gas in a closed container undergoes the cycle ABCA as shown in the figure. The net heat absorbed by the gas after it has completed 10 cycles is

మూసి ఉన్న పాత్రలో ఉన్న ఒక వాయువు పటంలో చూపిన విధంగా చక్రీయ మార్గం ABCA కు లోను కాబడింది. ఈ మార్గంలో వాయువు 10 చక్రాలు పూర్తి చేసిన, వాయువు శోషణం చేసిన నికర ఉష్ణం



Options :
1. - 1.5 kJ
2. + 1.5 kJ
3. + 2.25 kJ
4. - 2.25 kJ

(A) $-1.5\ \mathrm{kJ}$
(B) $+1.5\ \mathrm{kJ}$
(C) $+2.25\ \mathrm{kJ}$
(D) $-2.25\ \mathrm{kJ}$

Answer: (A) $-1.5\ \mathrm{kJ}$ · The council's preliminary key

Q129 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

An ideal gas has specific heat capacity at constant pressure $\frac{11}{10}R$. If one mole of this ideal gas at $125\ ^\circ\mathrm{C}$ does 83 J of work adiabatically, then the final temperature of the gas would be
(Universal gas constant, $R = 8.3\ \mathrm{J\,K^{-1}mol^{-1}}$)

(A) $25\ ^\circ\mathrm{C}$
(B) $50\ ^\circ\mathrm{C}$
(C) $75\ ^\circ\mathrm{C}$
(D) $100\ ^\circ\mathrm{C}$

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

Q130 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

As ideal monatomic gas of 1.5 moles is heated at a constant pressure 2 atm so that its temperature increases from $30\ ^\circ\mathrm{C}$ to $130\ ^\circ\mathrm{C}$. Work done by the gas is
(Universal gas constant = $8.3\ \mathrm{J\,mol^{-1}K^{-1}}$)

(A) $2500\ \mathrm{J}$
(B) $1450\ \mathrm{J}$
(C) $1245\ \mathrm{J}$
(D) $555\ \mathrm{J}$

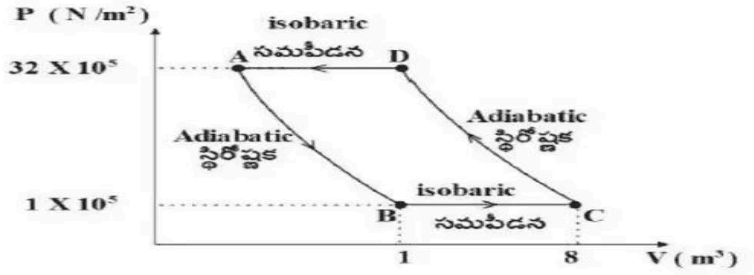
Answer: (C) $1245\ \mathrm{J}$ · The council's preliminary key

Q131 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

One mole of an ideal monatomic gas undergoes the process $A \rightarrow B \rightarrow C \rightarrow D \rightarrow A$ as shown in the graph. The work done during the process is
(see the figure above)

One mole of an ideal monatomic gas undergoes the process A → B → C → D → A as shown in the graph. The work done during the process is

ఒక మోల్ ఆదర్శ ఏక పరమాణుక వాయువు గ్రాఫులో చూపిన విధంగా A → B → C → D → A ప్రక్రియకు లోనైనది. ఈ ప్రక్రియలో జరిగిన పని



Options :

1. $-52.5 \times 10^5\ \mathrm{J}$
2. $-11.5 \times 10^5\ \mathrm{J}$
3. $-64 \times 10^5\ \mathrm{J}$
4. $-36 \times 10^5\ \mathrm{J}$

(A) -52.5×10^5 J
(B) -11.5×10^5 J
(C) -64×10^5 J
(D) -36×10^5 J

Answer: (A) -52.5×10^5 J · The council's preliminary key

Q132 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

A monatomic gas ($\gamma = \frac{5}{3}$, printed as r) at a pressure of 4 atm is compressed adiabatically so that its temperature rises from $27\ ^\circ\mathrm{C}$ to $327\ ^\circ\mathrm{C}$. The pressure of the gas in its final state is

(A) $2^{\frac{5}{3}}$ atm
(B) $2^{\frac{10}{3}}$ atm
(C) $2^{\frac{5}{2}}$ atm
(D) $2^{\frac{9}{2}}$ atm

Answer: (D) $2^{\frac{9}{2}}$ atm · The council's preliminary key

Q133 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

The change in the internal energy of 3 moles of a gas heated at constant volume from $20\ ^\circ\mathrm{C}$ to $40\ ^\circ\mathrm{C}$ is 1080 J. The molar specific heat of the gas at constant volume in $\mathrm{J\,mol^{-1}\,K^{-1}}$ is

(A) 21
(B) 18
(C) 24
(D) 12

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

Q134 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

A gas at $37\ ^\circ\mathrm{C}$ is compressed adiabatically to half of its volume, then the final temperature of the gas is
(Ratio of specific heat capacities of the gas is 1.5)

(A) $165.3\ ^\circ\mathrm{C}$
(B) $438.3\ ^\circ\mathrm{C}$
(C) $400\ ^\circ\mathrm{C}$
(D) $0\ ^\circ\mathrm{C}$

Answer: (A) $165.3\ ^\circ\mathrm{C}$ · The council's preliminary key

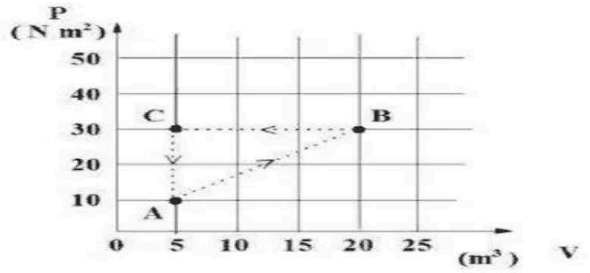
Q135 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

A gas in a closed container undergoes the cycle ABCA as shown in the figure. The net heat released by the gas after it has undergone 20 cycles is

(see the figure above)

A gas in a closed container undergoes the cycle ABCA as shown in the figure. The net heat released by the gas after it has undergone 20 cycles is

పటంలో చూపిన విధంగా మూసిన పాత్రలోని ఒక వాయువు ABCA చక్రమునకు లోబడినది. 20 చక్రాల తర్వాత ఆ వాయువు విడుదల చేసిన నికర ఉష్ణము



Options :

1. 3 k J
2. 2 k J
3. 1.5 k J
4. 4.5 k J

(A) 3 k J

(B) 2 k J

(C) 1.5 k J

(D) 4.5 k J

Answer: (A) 3 k J · The council's preliminary key

Q136 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

A vessel containing nitrogen gas is supplied a heat of 498 J, so as to raise the temperature of the gas by $40\ ^{\circ}\text{C}$ at constant pressure. The mass of nitrogen gas in the vessel is
(Molecular mass of nitrogen = 28 g; Universal gas constant = $8.3\ \text{J}\,\text{mol}^{-1}\text{K}^{-1}$)

(A) 18 g

(B) 12 g

(C) 20 g

(D) 15 g

Answer: (B) 12 g · The council's preliminary key

Q137 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

An ideal monatomic gas expands at constant pressure. The work done by the gas on its environment is 200 J, then the heat absorbed by the gas during the process is

(A) 500 J
(B) 300 J
(C) 200 J
(D) 600 J

Answer: (A) 500 J · The council's preliminary key

Q138 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

The work done by a Carnot engine operating between 300 K and 400 K is 400 J. The energy exhausted by the engine is

(A) 800 J
(B) 1200 J
(C) 400 J
(D) 1600 J

Answer: (B) 1200 J · The council's preliminary key

Q139 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

The slopes of the isothermal and adiabatic p - v graphs of a gas are by S_I and S_A respectively. If the heat capacity ratio of the gas is $\frac{3}{2}$, then $\frac{S_I}{S_A} =$

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

Answer: (B) $\frac{2}{3}$ · The council's preliminary key

Q140 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

A Carnot engine operating between temperatures 600 K and 300 K, absorbs 800 J of heat from the source. The mechanical work done per cycle is

(A) 400 J
(B) 650 J
(C) 750 J
(D) 600 J

Answer: (A) 400 J · The council's preliminary key

Q141 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

A Carnot engine operates between a source and a sink. The efficiency of the engine is 40 % and the temperature of the sink is 27 °C. If the efficiency is to be increased to 50 % then the temperature of the source must the increased by

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(A) 80 K
(B) 120 K
(C) 100 K
(D) 160 K

Answer: (C) 100 K · The council's preliminary key

Q142 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

A car engine has a power of 20 kW. The car makes a roundtrip of 1 hour. If the thermal efficiency of the engine is 40 % and the ambient temperature is 300 K. The energy generated by fuel combustion is

(A) 180000 kJ
(B) 240000 kJ
(C) 360000 kJ
(D) 270000 kJ

Answer: (A) 180000 kJ · The council's preliminary key

Q143 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

A gas is expanded from an initial state to a final state along a path on a P-V diagram. The path consists of (i) an isothermal expansion of work 50 J, (ii) an adiabatic expansion and (iii) an isothermal expansion of work 20 J. If the internal energy of gas is changed by -30 J, then the work done by gas during adiabatic expansion is

(A) 40 J
(B) 100 J
(C) 30 J
(D) 20 J

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

Q144 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

The temperature of the sink of a Carnot engine is 250 K. In order to increase the efficiency of the Carnot engine from 25 % to 50 %, the temperature of the source should be increased by

(A) $\frac{1}{3} \times 10^3$ K
(B) $\frac{1}{2} \times 10^3$ K
(C) 200 K
(D) $\frac{1}{6} \times 10^3$ K

Answer: (D) $\frac{1}{6} \times 10^3$ K · The council's preliminary key

Q145 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

Temperature determines the direction of net change of _____

(A) gross Kinetic energy
(B) gross Potential energy
(C) intermolecular Potential energy
(D) intermolecular Kinetic energy

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

Q146 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

A Carnot engine whose low-temperature reservoir is at 27 °C, has an efficiency 37.5 %. The high temperature reservoir is at _____

(A) $480\ ^\circ\mathrm{C}$
(B) $327\ ^\circ\mathrm{C}$
(C) $307\ ^\circ\mathrm{C}$
(D) $207\ ^\circ\mathrm{C}$

Answer: (D) $207\ ^\circ\mathrm{C}$ · The council's preliminary key

Q147 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

An electric refrigerator extracts 2000 calories from ice trays. If the coefficient of performance is 5, then the work done by the motor is _____ calories

(A) 5
(B) 400
(C) 2000
(D) 10000

Answer: (B) 400 · The council's preliminary key

Q148 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

Find the ratio of $\frac{\Delta Q}{\Delta W}$ in an isobaric process, if the ratio of molar specific heat capacities of the gas used is $\frac{C_P}{C_V} = \gamma$

(A) $\frac{\gamma}{\gamma-1}$
(B) $\frac{\gamma-1}{\gamma}$
(C) $\frac{\gamma+1}{\gamma}$
(D) $\frac{\gamma}{\gamma+1}$

Answer: (A) $\frac{\gamma}{\gamma-1}$ · The council's preliminary key

Q149 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

Which of the following, in general, is a slow process?

(A) Isothermal
(B) Adiabatic
(C) Isobaric
(D) Isochoric

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

Q150 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

$\Delta W = 0$ for the process _____

(A) Isobaric
(B) Isochoric
(C) Isothermal
(D) Adiabatic

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

Q151 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

A given system undergoes a change in which the work done by the system equals the decrease in its internal energy. The system must have undergone an _____

(A) Isothermal change
(B) Adiabatic change
(C) Isobaric change
(D) Isochoric change

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

Q152 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

Molar specific heat at constant pressure C_P is related to internal energy U and absolute temperature T as $C_P =$ _____

(A) $\frac{U}{T}$
(B) $\frac{dU}{dT}$
(C) $\frac{dU}{dT} + R$
(D) $U \times T$

Answer: (C) $\frac{dU}{dT} + R$ · The council's preliminary key

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Q153 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

Three designs are proposed for an engine which is to operate between $500\ K$ and $300\ K$. Design A claims to produce 150 J of work per 1000 J of heat input, design B 450 J of work per 1000 J and design C 300 J of work per 1000 J. Which of the designs would you choose?

(A) A
(B) B
(C) C
(D) None is suitable

Answer: (C) C · Checked by our team

Q154 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

A Carnot engine having an efficiency $1/5$ as a heat engine, is used as a refrigerator. If the work done on the system is 50 J, the amount of energy absorbed from the reservoir at lower temperature is _____

(A) 90 J
(B) 99 J
(C) 200 J
(D) 1 J

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

Q155 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

A Carnot engine whose efficiency is $40\ \%$ takes in heat from source maintained at a temperature of $500\ K$. It is desired to have an engine of efficiency $60\ \%$. Then, the intake temperature for the same exhaust (sink) temperature must be _____

(A) $1200\ K$
(B) $750\ K$
(C) $600\ K$
(D) $800\ K$

Answer: (B) $750\ K$ · The council's preliminary key

Q156 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

Work done by a gas in the process shown in the figure will be _____

(see the figure above)

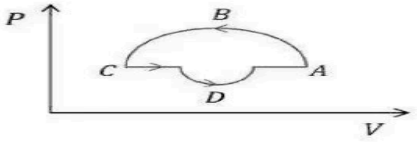
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Mandatory : No

AP EAPCET 2021
AP EAPCET 2021

Work done by a gas in the process shown in the figure will be _____

ఈ క్రింది పటములో చూపిన ప్రక్రియలో వాయువు చేసిన పని _____



Options :

1. Positive
ధనాత్మకము

2. Negative
ఋణాత్మకము

3. Zero
శూన్యము

4. Can't be determined
నిర్ధారించలేము

(A) Positive
(B) Negative
(C) Zero
(D) Can't be determined

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

Q157 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

The efficiency of Carnot heat engine _____

(A) is independent of the temperature of the source and the sink
(B) is independent of the working substance
(C) can be 100 %
(D) is no affected by the thermal capacity of the source or the sink.

Answer: (B) is independent of the working substance · The council's preliminary key

Q158 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

In a thermodynamic process the pressure of a fixed mass of a gas is changed in such a manner that the gas released 30 joules of heat and 18 joules of work was done on the gas. If the initial internal energy of the gas was 60 joules, the final internal energy will be:

(A) 32 J
(B) 48 J
(C) 72 J
(D) 96 J

Answer: (B) 48 J · The council's preliminary key

Q159 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

When the ideal gas is compressed isothermally, then its pressure _____

(A) Increases
(B) Decreases
(C) remains the same
(D) first increases and then decreases

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

Q160 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

Which of the following is the best container for a gas during adiabatic process?

(A) Glass vessel
(B) Copper vessel
(C) Wood vessel
(D) Thermos flask

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

Q161 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

Match the following?
Column-I | Column-II
a) Ratio of $\Delta Q/\Delta U$ in an isobaric process | i) $\frac{T_1}{(T_1-T_2)}$
b) Ratio of $\Delta Q/\Delta W$ in an isobaric process | ii) $\frac{T_2}{(T_1-T_2)}$
c) Coefficient of performance of a refrigerator | iii) $\frac{\gamma}{\gamma-1}$
d) Coefficient of performance of a heat pump | iv) γ

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

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

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Q162 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

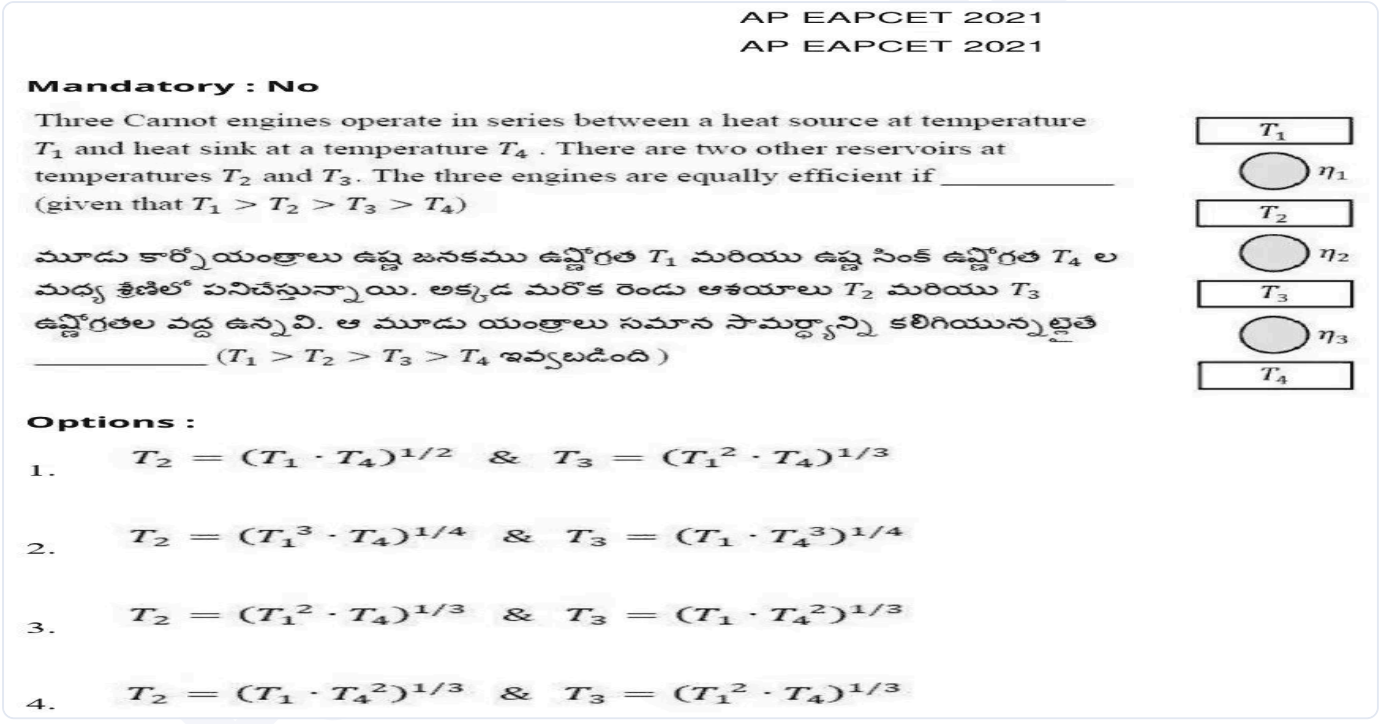
Specific heat of a gas undergoing adiabatic change is _____

(A) Zero
(B) Infinite
(C) Positive
(D) Negative

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

Q163 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

Three Carnot engines operate in series between a heat source at temperature T_1 and heat sink at a temperature T_4. There are two other reservoirs at temperatures T_2 and T_3. The three engines are equally efficient if _____ (given that $T_1 > T_2 > T_3 > T_4$)
(see the figure above)


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AP EAPCET 2021

Mandatory : No

Three Carnot engines operate in series between a heat source at temperature T_1 and heat sink at a temperature T_4 . There are two other reservoirs at temperatures T_2 and T_3. The three engines are equally efficient if _____ (given that $T_1 > T_2 > T_3 > T_4$)

మూడు కార్నో యంత్రాలు ఉష్ణ జనకము ఉష్ణోగ్రత T_1 మరియు ఉష్ణ సింక్ ఉష్ణోగ్రత T_4 ల మధ్య శ్రేణిలో పనిచేస్తున్నాయి. అక్కడ మరొక రెండు ఆశయాలు T_2 మరియు T_3 ఉష్ణోగ్రతల వద్ద ఉన్నవి. ఆ మూడు యంత్రాలు సమాన సామర్థ్యాన్ని కలిగియున్నట్లైతే _____ ($T_1 > T_2 > T_3 > T_4$ ఇవ్వబడింది)

T_1 η_1 T_2 η_2 T_3 η_3 T_4

Options :

1. $T_2 = (T_1 \cdot T_4)^{1/2}$ & $T_3 = (T_1^2 \cdot T_4)^{1/3}$
2. $T_2 = (T_1^3 \cdot T_4)^{1/4}$ & $T_3 = (T_1 \cdot T_4^3)^{1/4}$
3. $T_2 = (T_1^2 \cdot T_4)^{1/3}$ & $T_3 = (T_1 \cdot T_4^2)^{1/3}$
4. $T_2 = (T_1 \cdot T_4^2)^{1/3}$ & $T_3 = (T_1^2 \cdot T_4)^{1/3}$

(A) $T_2 = (T_1 \cdot T_4)^{1/2}$ & $T_3 = (T_1^2 \cdot T_4)^{1/3}$
(B) $T_2 = (T_1^3 \cdot T_4)^{1/4}$ & $T_3 = (T_1 \cdot T_4^3)^{1/4}$
(C) $T_2 = (T_1^2 \cdot T_4)^{1/3}$ & $T_3 = (T_1 \cdot T_4^2)^{1/3}$
(D) $T_2 = (T_1 \cdot T_4^2)^{1/3}$ & $T_3 = (T_1^2 \cdot T_4)^{1/3}$

Answer: (C) $T_2 = (T_1^2 \cdot T_4)^{1/3}$ & $T_3 = (T_1 \cdot T_4^2)^{1/3}$ · The council's preliminary key

Q164 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

Two containers A and B contain equal volumes of an identical gas at the same pressure and temperature. The gas in container A is compressed to half its original volume isothermally, while the

gas in container B is compressed to half its original volume adiabatically. The ratio of the final pressure of gas in container B to that of gas in container A is _____

(A) $(2)^{\gamma-1}$

(B) $\left(\frac{1}{2}\right)^{\gamma-1}$

(C) $\left(\frac{1}{1-\gamma}\right)^{2}$

(D) $\left(\frac{1}{\gamma-1}\right)^{2}$

Answer: (A) $(2)^{\gamma-1}$ · The council's preliminary key

Q165 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

In a given process, for an ideal gas, $\Delta W = 0$ and $\Delta Q < 0$. Then for the gas, _____

(A) The temperature will decrease

(B) The volume will increase

(C) The pressure will remain constant

(D) The temperature will increase

Answer: (A) The temperature will decrease · The council's preliminary key

Q166 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

Isothermal process is the graph between:

(A) Pressure and Temperature

(B) Pressure and volume

(C) Volume and temperature

(D) PV and Temperature

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

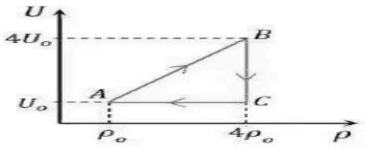
Q167 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

For a monoatomic ideal gas following the cyclic process $ABCA$ shown in the U vs ρ plot, identify the incorrect option: *(see the figure above)*

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Mandatory : No

For a monoatomic ideal gas following the cyclic process $ABCA$ shown in the U vs ρ plot, identify the incorrect option:



కింద చూపబడిన U - ρ గ్రాఫ్‌లో ఒక ఏక పరమాణు ఆదర్శ వాయువు విషయంలో $ABCA$ చక్రీయ ప్రక్రియను సూచిస్తుంది. అయితే ఈ కింది వాటిలో సరికానిది

Options :

1. Molar heat capacity of the process AB is $\frac{R}{2}$
   AB ప్రక్రియలో మోలార్ ఉష్ణ సామర్థ్యము $\frac{R}{2}$
2. Heat is rejected by the system in path BC
   BC మార్గములో వ్యవస్థ చేత ఉష్ణము తిరస్కరించబడుతుంది
3. AP EAPCET 2021
   AP EAPCET 2021
   Molar heat capacity for the process BC is $\frac{2R}{3}$
   BC ప్రక్రియలో మోలార్ ఉష్ణ సామర్థ్యము $\frac{2R}{3}$
4. Work done by the system in the process CA is $\frac{2U_0}{3}\ln 4$
   CA ప్రక్రియలో వ్యవస్థ చేత జరిగిన పని $CA = \frac{2U_0}{3}\ln 4$

(A) Molar heat capacity of the process AB is $\frac{R}{2}$

(B) Heat is rejected by the system in path BC

(C) Molar heat capacity for the process BC is $\frac{2R}{3}$

(D) Work done by the system in the process CA is $\frac{2U_0}{3}\ln 4$

Answer: (C) Molar heat capacity for the process BC is $\frac{2R}{3}$ · The council's preliminary key

Q168 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

A Carnot engine whose heat sink is at $27\ ^\circ\text{C}$ has an efficieny (sic) of $40\ \%$. By how much should its source temperature be changed so as to increase its efficiency to $60\ \%$?

(A) $250\ \text{K}$

(B) $100\ \text{K}$

(C) $500\ \text{K}$

(D) $350\ \text{K}$

Answer: (A) $250\ \text{K}$ · The council's preliminary key

Q169 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

A diatomic gas is heated at constant pressure, what fraction of the heat energy is used to increase the internal energy?

(A) $\frac{3}{5}$
(B) $\frac{3}{7}$
(C) $\frac{5}{7}$
(D) $\frac{5}{9}$

Answer: (C) $\frac{5}{7}$ · The council's preliminary key

Q170 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

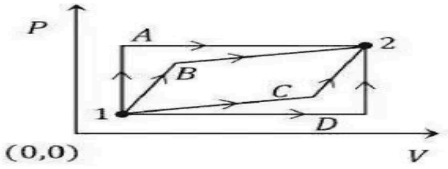
An ideal gas is taken from state-1 to state-2 through optional path A, B, C and D as shown in the P-V diagram. Let Q, W and U represent the heat supplied, work done and change internal energy respectively, then
(see the figure above)

Mandatory : No

AP EAPCET 2021
AP EAPCET 2021

An ideal gas is taken from state-1 to state-2 through optional path A, B, C and D as shown in the P-V diagram. Let Q, W and U represent the heat supplied, work done and change internal energy respectively, then

ఒక ఆదర్శ వాయువు స్థితి 1 నుండి స్థితి 2 కి P-V గ్రాఫ్ పటములో చూపిన విధముగా A, B, C మరియు D మార్గముల ద్వారా తీసుకుని రాబడినది. Q, W మరియు U లు క్రమముగా వాయువుకు అందించిన ఉష్ణము, జరిగిన పని మరియు అంతరిక శక్తి మార్పులను సూచిస్తే, అప్పుడు _____



Options :

1. $Q_A - Q_D = W_A - W_D$
2. $Q_B - W_B > Q_C - W_C$
3. $W_A < W_B < W_C < W_D$
4. $Q_A < Q_B < Q_C < Q_D$

(A) $Q_A - Q_D = W_A - W_D$
(B) $Q_B - W_B > Q_C - W_C$
(C) $W_A < W_B < W_C < W_D$
(D) $Q_A < Q_B < Q_C < Q_D$

Answer: (A) $Q_A - Q_D = W_A - W_D$ · The council's preliminary key

Q171 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

A system is taken from state-A to state-B along two different paths. The heat absorbed and work done by the system along these two paths are Q_1, Q_2 and W_1, W_2 respectively, then ___

(A) $Q_1 = Q_2$
(B) $W_1 = W_2$
(C) $Q_1 - W_1 = Q_2 - W_2$
(D) $Q_1 + W_1 = Q_2 + W_2$

Answer: (C) $Q_1 - W_1 = Q_2 - W_2$ · The council's preliminary key

Q172 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

A gas ($\gamma = 1.5$) is suddenly compressed to $(1/4)^{th}$ its initial volume. Then find the ratio of its final to initial pressure.

(A) $1:16$
(B) $1:8$
(C) $1:4$
(D) $8:1$

Answer: (D) $8:1$ · The council's preliminary key

Q173 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Which of the following is NOT a reversible process?

(A) Melting of ice
(B) Conduction of heat
(C) Isothermal expansion of gas
(D) Adiabatic expansion of gas

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

Q174 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

A refrigerator with coefficient of performance 0.25 releases 250 J of heat to a hot reservoir. The work done on the working substance is _____

(A) $\frac{100}{3}$ J
(B) 150 J
(C) 200 J
(D) 50 J

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

Q175 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

An ideal Carnot engine whose efficiency is 50%, receives heat at 500 K. If the efficiency is to be 60%, the intake temperature for the same exhaust temperature is

(A) 600 K
(B) 625 K
(C) 650 K
(D) 700 K

Answer: (B) 625 K · The council's preliminary key

Q176 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

An engine performs 2000 J of mechanical work and discards 4000 J of heat each cycle. What is the thermal efficiency of the engine?

(A) 45.5 %
(B) 31.4%
(C) 25%
(D) 33.3%

Answer: (D) 33.3% · The council's preliminary key

Q177 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

A polyatomic gas follows a law T^2V^α = constant. Find 'α' for which the heat exchange of gas in the process becomes zero

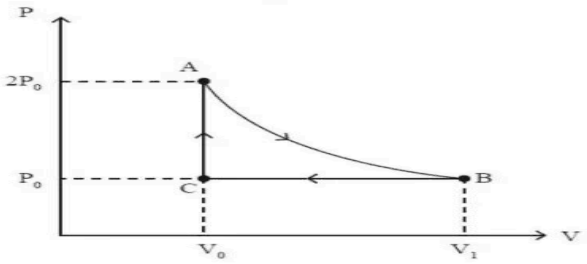
(A) $\alpha = 3/2$
(B) $\alpha = 2/3$
(C) $\alpha = 4/3$
(D) $\alpha = 3/4$

Answer: (B) $\alpha = 2/3$ · The council's preliminary key

Q178 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

An ideal gas goes through a process $A \to B \to C \to A$ cycle. The process $A \to B$ is adiabatic. Calculate the work done in the process $A \to B$.
(see the figure above)

An ideal gas goes through a process $A \rightarrow B \rightarrow C \rightarrow A$ cycle. The process $A \rightarrow B$ is adiabatic. Calculate the work done in the process $A \rightarrow B$.



Options :

1. P_0V_0
2. $\frac{P_0V_0\left(2^{1/\gamma}-2\right)}{(1-\gamma)}$
3. $P_0V_0\ln(2)$
4. $\frac{P_0V_0\left(2^{1/\gamma}-1\right)}{(\gamma-1)}$

(A) P_0V_0

(B) $\frac{P_0V_0\left(2^{1/\gamma}-2\right)}{(1-\gamma)}$

(C) $P_0V_0\ln(2)$

(D) $\frac{P_0V_0\left(2^{1/\gamma}-1\right)}{(\gamma-1)}$

Answer: (B) $\frac{P_0V_0\left(2^{1/\gamma}-2\right)}{(1-\gamma)}$ · The council's preliminary key

Q179 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

An ideal gas undergoes an adiabatic process. If the pressure of the gas is reduced by 0.1 % then the volume is changed by (Given $r = \frac{C_p}{C_v} = 5/3$)

(A) 0.1 %

(B) 0.05 %

(C) 0.06 %

(D) -0.05 %

Answer: (C) 0.06 % · The council's preliminary key

Q180 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

The carnot heat engine have an efficiency of 50 %. The temperature of sink is maintained at 500 K. To increase the efficiency upto 80 %, the increment in the source temperature is

(A) 1500 K
(B) 2500 K
(C) 500 K
(D) 2000 K

Answer: (A) 1500 K · The council's preliminary key

Q181 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

An ideal monoatomic gas of volume V is adiabatically expanded to a volume 3 V at 27 °C. The final temperature in Kelvins is
(use $\frac{C_P}{C_V} = \frac{5}{3}$)

(A) 144.2
(B) 170.3
(C) 50.4
(D) 100.2

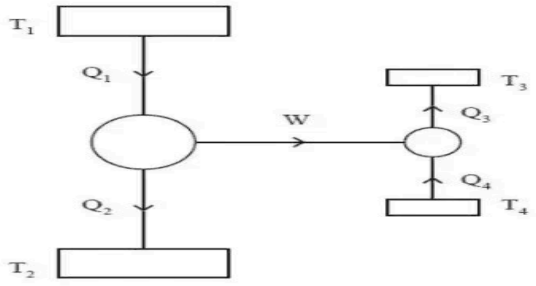
Answer: (A) 144.2 · The council's preliminary key

Q182 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

The following figure shows a Carnot engine that works between temperatures T_1 = 400 K and T_2 = 200 K and drives a Carnot refrigeration that works between temperatures T_3 = 350 K and T_4 = 250 K. The quantity $\frac{Q_3}{Q_1}$ will be

(see the figure above)

The following figure shows a Carnot engine that works between temperatures $T_1 = 400$ K and $T_2 = 200$ K and drives a Carnot refrigeration that works between temperatures $T_3 = 350$ K and $T_4 = 250$ K. The quantity $\frac{Q_3}{Q_1}$ will be



Options :

1. 1.5
2. 2.0
3. 2.25
4. 1.75

(A) 1.5
(B) 2.0
(C) 2.25
(D) 1.75

Answer: (D) 1.75 · The council's preliminary key

Q183 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

Consider a two stage Carnot engine. In the first stage heat Q_1 is absorbed at temperature T and heat Q_2 is expelled at temperature αT (where $\alpha < 1$). In the second stage heat Q_2 is absorbed at temperature αT and heat Q_3 is expelled at temperature βT ($\beta < \alpha$). The efficiency of the Carnot engine will be

(A) $1 - \alpha - \beta$
(B) $1 - \alpha$
(C) $1 - \beta$
(D) $1 - \alpha\beta$

Answer: (C) $1 - \beta$ · The council's preliminary key

Q184 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

A diatomic gas of volume $2\ \mathrm{m}^3$ at a pressure $2 \times 10^5\ \mathrm{N/m^2}$ is compressed adiabatically to a volume $0.5\ \mathrm{m}^3$. The work done in this process is.
[Use $4^{1.4} = 6.96$]

(A) 2.96×10^5 J
(B) -2.96×10^5 J
(C) -7.4×10^5 J
(D) 7.4×10^5 J

Answer: (C) -7.4×10^5 J · The council's preliminary key

Q185 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

500 g of water is heated from $30\,^\circ\mathrm{C}$ to $90\,^\circ\mathrm{C}$. What is the change in its internal energy?
(Specific heat of water is $4184\ \mathrm{J\,kg^{-1}K^{-1}}$)

(A) 1.25×10^5 J
(B) 2.0×10^5 J
(C) 1.3×10^4 J
(D) 2.0×10^4 J

Answer: (A) 1.25×10^5 J · The council's preliminary key

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Q186 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

A tyre pumped to a pressure of 2 atmosphere, suddenly bursts. If the temperature of air before expansion is T then the air temperature after the tyre busts is
(Assume the expansion is adiabatic and adiabatic constant $\gamma = \frac{3}{2}$)

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

Dropped by TGCHE. Full marks to everyone. · The council's preliminary key

Q187 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

A gas container A is in thermal equilibrium with another gas of the same mass in container B. If we denote the corresponding pressures and volumes by the suffixes A and B, then which of the following statement is most likely to be true.

(A) $\mathrm{P_A} = \mathrm{P_B}\ ,\ \mathrm{V_A} \neq \mathrm{V_B}$
(B) $\mathrm{P_A} \neq \mathrm{P_B}\ ,\ \mathrm{V_A} = \mathrm{V_B}$
(C) $\mathrm{P_A V_B} = \mathrm{P_B V_A}$
(D) $\mathrm{P_A V_A} = \mathrm{P_B V_B}$

Answer: (D) $\mathrm{P_A V_A} = \mathrm{P_B V_B}$ · The council's preliminary key

Q188 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

If source is at a temperature T_1 and sink is at a temperature T_2, the efficiency of the Carnot engine is maximum when _____

(A) T_1 and T_2 are equal
(B) T_1 is low and T_2 is high
(C) T_1 is high and T_2 is low
(D) Both T_1 and T_2 are high

Answer: (C) T_1 is high and T_2 is low · The council's preliminary key

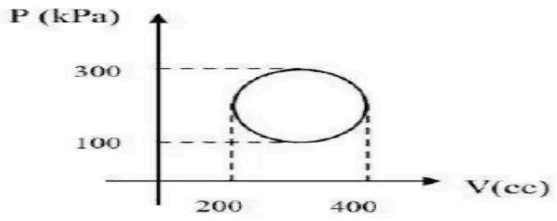
Q189 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

Calculate the heat absorbed by the system in going through the process shown in figure
(see the figure above)

EdLoop EAPCET

Calculate the heat absorbed by the system in going through the process shown in figure

పటము లో చూపిన ప్రక్రియ ద్వారా పోతున్న వ్యవస్థ శోషణ చేసే ఉష్ణాన్ని గణింపుము.



Options :

1. 31.4 J

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AP EAMCET 2020

2. 3.14 J

3. 3.14×10^4 J

4. 3.14×10^6 J

(A) 31.4 J

(B) 3.14 J

(C) 3.14×10^4 J

(D) 3.14×10^6 J

Answer: (A) 31.4 J · The council's preliminary key

Q190 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

The first law of thermodynamics confirms the law of _____

(A) Conservation of momentum of molecules

(B) Conservation of energy

(C) Flow of heat in a particular direction

(D) Conservation of heat energy and mechanical energy

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

Q191 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

One mole of an ideal diatomic gas undergoes a transition from A to B along a path AB as shown in figure. The change in internal energy of the gas during the transition is

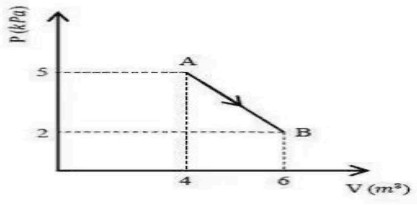
(see the figure above)

Orientation : Vertical

AP EAMCET 2020
AP EAMCET 2020

One mole of an ideal diatomic gas undergoes a transition from A to B along a path AB as shown in figure. The change in internal energy of the gas during the transition is

పటంలో చూపిన విధంగా ఒక మోల్ ద్విపరమాణుక ఆదర్శ వాయువు A నుండి B కు AB పథం ద్వారా మారిందనుకొనుము. ఇలా మారేటప్పుడు దాని అంతర్గత శక్తిలోని మార్పు ఎంత?



Options :

1. $-20\ kJ$
2. $20\ J$
3. $-12\ kJ$
4. $20\ kJ$

(A) -20 kJ

(B) 20 J

(C) -12 kJ

(D) 20 kJ

Answer: (A) -20 kJ · The council's preliminary key

Q192 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

A system goes from A to B via two processes I and II as shown in the figure. If ΔU_1 and ΔU_2 are the changes in internal energies in the processes I and II respectively, then

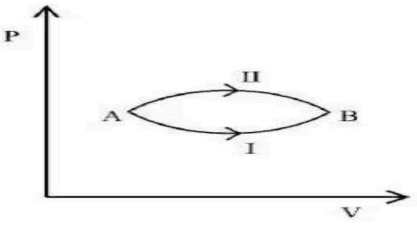
(see the figure above)

Orientation : Vertical

AP EAMCET 2020
AP EAMCET 2020

A system goes from A to B via two processes I and II as shown in the figure. If ΔU_1 and ΔU_2 are the changes in internal energies in the processes I and II respectively, then

ఒక వ్యవస్థ A నుండి B కు రెండు పద్ధతులలో I మరియు II పటంలో చూపిన విధంగా మారినవి. పద్ధతి I మరియు II ల లో అంతర్గత శక్తులలో భేదాలు వరుసగా ΔU_1 మరియు ΔU_2 , అయిన



Options :

1. $\Delta U_1 = \Delta U_2$
2. $\Delta U_1 > \Delta U_2$
3. $\Delta U_1 < \Delta U_2$
4. $\Delta U_1 \neq \Delta U_2$

(A) $\Delta U_1 = \Delta U_2$
(B) $\Delta U_1 > \Delta U_2$
(C) $\Delta U_1 < \Delta U_2$
(D) $\Delta U_1 \neq \Delta U_2$

Answer: (A) $\Delta U_1 = \Delta U_2$ · The council's preliminary key

Q193 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

An electrical refrigerator with $\beta = 5$ extracts $5000\ \mathrm{J}$ from the contents of the refrigerator. During this process, find the electrical energy utilized by its motor.

(A) $1\ \mathrm{kJ}$
(B) $0.5\ \mathrm{kJ}$
(C) $0.8\ \mathrm{kJ}$
(D) $1.2\ \mathrm{kJ}$

Answer: (A) $1\ \mathrm{kJ}$ · The council's preliminary key

Q194 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

A Carnot engine takes 3×10^6 calories of heat from reservoir at $627\,^\circ\mathrm{C}$ and gives it to a sink at $27\,^\circ\mathrm{C}$. The work done by the engine is

(A) Zero
(B) $8.4 \times 10^6\ \mathrm{J}$
(C) $4.2 \times 10^6\ \mathrm{J}$
(D) $16.8 \times 10^6\ \mathrm{J}$

Answer: (B) $8.4 \times 10^6\ \mathrm{J}$ · The council's preliminary key

Q195 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

During phase change, entropy _____

(A) remains constant
(B) Always increases
(C) Always decreases
(D) May increase or decrease

Answer: (D) May increase or decrease · The council's preliminary key

Q196 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

A Carnot's engine has an efficiency of 25% when its sink is at 27°C. If it has to be increased to 40%, what should be the temperature of the sink keeping the temperature of the source constant?

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(A) 320 K
(B) 375 K
(C) 340 K
(D) 300 K

Answer: (C) 340 K · The council's preliminary key

Q197 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

The efficiency of an ideal Carnot engine working between temperatures T_1 and T_2 is 1/3. If the temperature of the sink is reduced by 40%, then its efficiency will be

(A) 50 %
(B) 25 %
(C) 60 %
(D) 75 %

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

Q198 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

An ideal heat engine has an efficiency 'η' the coefficient of performance of the engine when driven backward will be

(A) $1-\left[\frac{1}{\eta}\right]$
(B) $\eta-\left[\frac{1}{\eta}\right]$
(C) $\left[\frac{1}{\eta}\right]-1$
(D) $\frac{1}{1-\eta}$

Answer: (C) $\left[\frac{1}{\eta}\right]-1$ · The council's preliminary key

Q199 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

In a thermodynamic process pressure of a fixed mass of a gas is changed in such a manner that the gas releases 30 J of heat and 10 J of work was done on the gas. If the initial internal energy of the gas was 30 J, then the final internal energy will be

(A) 2 J
(B) −18 J
(C) 10 J
(D) 58 J

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

Q200 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

A gas is compressed from a volume of $2\ \mathrm{m}^3$ to a volume of $1\ \mathrm{m}^3$ at a constant pressure of $100\ \mathrm{N.m}^{-2}$. Then it is heated at constant volume by supplying $150\ \mathrm{J}$ of energy. As a result, the internal energy of the gas _____

(A) increases by $250\ \mathrm{J}$
(B) decreases by $250\ \mathrm{J}$
(C) decreases by $50\ \mathrm{J}$
(D) increases by $50\ \mathrm{J}$

Answer: (A) increases by $250\ \mathrm{J}$ · The council's preliminary key

Q201 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

The efficiency of a Carnot's engine is 100% only when

(A) Ideal gas is used as a working substance
(B) Temperature of the sink is equal to absolute zero
(C) Source temperature is equal to the temperature of the sink
(D) Source temperature is equal to absolute zero

Answer: (B) Temperature of the sink is equal to absolute zero · The council's preliminary key

Q202 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

The condition $dQ = dW$ holds good in which of the following?

(A) Adiabatic process
(B) Isothermal process
(C) Isochoric process
(D) Isobaric process

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

Q203 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

306 J of heat is required to raise the temperature of 2 moles of an ideal gas at constant pressure from $25\,^{\circ}C$ to $35\,^{\circ}C$. The amount of heat required to raise the temperature of the same gas through the same range at constant volume is

(A) 306 J
(B) 153 J
(C) 140 J
(D) 80 J

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

Q204 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

The door of an operating refrigerator is kept open. As a result, the temperature of the room will

(A) remain unchanged
(B) increases
(C) decreases
(D) depends on the contents inside the refrigerator

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

Q205 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

There is no change in internal energy of an ideal gas when it undergoes

(A) Isothermal expansion
(B) Adiabatic expansion
(C) Free expansion
(D) Isobaric expansion

Options (1) or (3) were accepted. More than one answer was accepted. · The council's preliminary key

Q206 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Which of the following parameters does not characterize the thermodynamic state of matter?

(A) Temperature
(B) Pressure
(C) Work
(D) Volume

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

Q207 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

When the temperature difference between the source and sink increases, the efficiency of the heat engine _____

(A) Decreases
(B) Increases
(C) is not affected
(D) may increase or decrease

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

Q208 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

The ratio of the slopes of isothermal and adiabatic curves is _____

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(A) 1
(B) γ
(C) $1/\gamma$
(D) $3/2$

Answer: (C) $1/\gamma$ · The council's preliminary key

Q209 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

The triple point of water is

(A) $273.16\ ^\circ\mathrm{C}$
(B) $273.16\ \mathrm{K}$
(C) $273.16\ ^\circ\mathrm{F}$
(D) $0.15\ \mathrm{K}$

Answer: (B) $273.16\ \mathrm{K}$ · The council's preliminary key

Q210 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

An ideal Carnot's engine with an efficiency of 30% operates between a source and a sink. If the temperature of the source is 500 K, that of the sink is _____

(A) $27\ ^\circ\mathrm{C}$
(B) $57\ ^\circ\mathrm{C}$
(C) $77\ ^\circ\mathrm{C}$
(D) $107\ ^\circ\mathrm{C}$

Answer: (C) $77\ ^\circ\mathrm{C}$ · The council's preliminary key

Q211 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

First law of thermodynamics is represented by

(A) $dQ = dU + dW$
(B) $dU = dW + PdV$
(C) $dW = dQ + dU$
(D) $dU = dQ + PdV$

Answer: (A) $dQ = dU + dW$ · The council's preliminary key

Q212 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

What is the name of Ideal-gas process in which no heat is transferred?

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(A) Isochoric
(B) Isothermal
(C) Isobaric
(D) Adiabatic

Answer: (D) Adiabatic · Official TGCHE final key

Q213 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

A Carnot engine C_1 operates between temperature T_1 and T_2 ($T_1 > T_2$). A second Carnot engine C_2 uses all the heat rejected by the engine C_1 and operates between temperature T_2 and T_3 (where $T_2 > T_3$). The efficiency of this combined (C_1 and C_2 together) engine is

(A) $1 - \frac{T_3}{T_1}$
(B) $1 - \frac{T_3}{T_2}$
(C) $1 - \frac{(T_2 + T_3)}{T_1}$
(D) $1 - \left(1 - \frac{T_2}{T_1}\right)\left(1 - \frac{T_3}{T_2}\right)$

Answer: (A) $1 - \frac{T_3}{T_1}$ · Checked by our team

Q214 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

A carnot engine whose efficiency is 40%, receives heat at 500 K. If the efficiency is to be 50%, the source temperature for the same exhaust temperature is

(A) 900 K
(B) 600 K
(C) 700 K
(D) 800 K

Answer: (B) 600 K · Official TGCHE final key

Q215 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

A system goes from A to B via two processes I and II as shown in figure. If ΔU_1 and ΔU_2 are the changes in internal energies in the processes I and II respectively, then the relation between ΔU_1 and ΔU_2 is

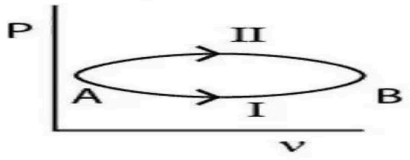
(see the figure above)

EdLoop EAPCET

Question Number : 100 Question Id : 719650900 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 system goes from A to B via two processes I and II as shown in figure. If ΔU_1 and ΔU_2 are the changes in internal energies in the processes I and II respectively, then the relation between ΔU_1 and ΔU_2 is

I మరియు II ప్రక్రియల ద్వారా ఒక వ్యవస్థ A నుండి B స్థితికి చేరుతుంది. ΔU_1 మరియు ΔU_2 లు వరుసగా I మరియు II ప్రక్రియలలో అంతర్గత శక్తి మార్పులైతే, ΔU_1 మరియు ΔU_2 ల మధ్య సంబంధం



Options :

1. $\Delta U_1 = \Delta U_2$
2. $\Delta U_2 < \Delta U_1$
3. $\Delta U_2 > \Delta U_1$
4. undetermined
   లెక్కించడం సాధ్యం కాదు

(A) $\Delta U_1 = \Delta U_2$
(B) $\Delta U_2 < \Delta U_1$
(C) $\Delta U_2 > \Delta U_1$
(D) undetermined

Answer: (A) $\Delta U_1 = \Delta U_2$ · Official TGCHE final key

Q216 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

A gas is at constant pressure $4 \times 10^5\ N/m^2$. When a heat energy of 2000 J is supplied to the gas, its volume changes by $3 \times 10^{-3}\ m^3$. What is the increase in its internal energy?

(A) 650 J
(B) 900 J
(C) 800 J
(D) 400 J

Answer: (C) 800 J · Official TGCHE final key

Q217 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

Certain amount of heat supplied to an ideal gas under isothermal condition will result in

(A) an increase in the internal energy of the gas
(B) external work done and a change in temperature
(C) a rise in temperature
(D) external work done by the system

Answer: (D) external work done by the system · Official TGCHE final key

Q218 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

The specific heat of helium at constant volume is $12.6\ \mathrm{J\,mol^{-1}K^{-1}}$. The specific heat of helium at constant pressure in $\mathrm{J\,mol^{-1}K^{-1}}$ is approximately (Assume the universal gas constant $R = 8.314\ \mathrm{J\,mol^{-1}K^{-1}}$)

(A) 12.6
(B) 16.8
(C) 18.9
(D) 20.9

Answer: (D) 20.9 · Official TGCHE final key

Q219 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

Work done on heating one mole of monoatomic gas adiabatically through 20°C is W. Then the work done on heating 6 moles of rigid diatomic gas through the same change in temperature

(A) 9 W
(B) 10 W
(C) 12 W
(D) 8 W

Answer: (B) 10 W · Official TGCHE final key

Q220 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

Five moles of an ideal gas has pressure P_o, volume V_o and temperature T_o. The gas is expanded to volume $3V_o$ along a path so that the pressure P is changed as function of volume V as $P = P_o(V/V_o)$. The pressure is then reduced to P_o maintaining the volume constant. The gas undergoes an isobaric compression till the volume & temperature become V_o & T_o respectively. The total work done by the gas during the entire process is

(A) $P_oV_o/3$
(B) $3P_oV_o$
(C) $5P_oV_o/3$
(D) $2P_oV_o$

Answer: (D) $2P_oV_o$ · Official TGCHE final key

Q221 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

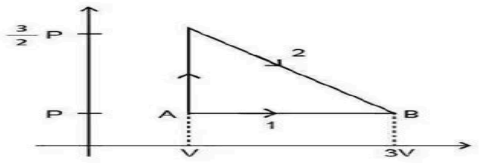
The P-V diagram shown below indicates two paths along which a sample of gas can be taken from state A to state B. The energy equal to 5 PV in the form of heat is required to be transferred if the Path -1 is chosen. How much energy in the form of heat should be transferred if Path-2 is chosen? *(see the figure above)*

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Question Number : 99 Question Id : 719650259 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

The P-V diagram shown below indicates two paths along which a sample of gas can be taken from state A to state B. The energy equal to 5 PV in the form of heat is required to be transferred if the Path -1 is chosen. How much energy in the form of heat should be transferred if Path-2 is chosen?

క్రింది చూపినట్లు ఒక P-V చిత్రపటంలో ఒక వాయు నమూనాను స్థితి A నుండి స్థితి B కు తీసుకొన పొవు రెండు పథాలను సూచిస్తుంది. పథము-1 తీసుకొన్నట్లయితే 5 PV లకు సమానమైన శక్తిని ఉష్ణము రూపంలో మార్పవలసి ఉంటుంది. పథము-2 ద్వారా పంపటానికి ఎంత శక్తిని ఉష్ణము రూపంలోకి మార్పవలసి ఉంటుంది.



Options :

1. $\frac{11}{2}$ PV
2. 6 PV
3. $\frac{9}{2}$ PV
4. 7 PV

(A) $\frac{11}{2}PV$
(B) $6\ PV$
(C) $\frac{9}{2}PV$
(D) $7\ PV$

Answer: (A) $\frac{11}{2}PV$ · Official TGCHE final key

Q222 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

In the carnot engine when the heat is taken from the source, then the temperature of the source

(A) remains constant
(B) does not remain constant
(C) decreases
(D) increases

Answer: (A) remains constant · Official TGCHE final key

Q223 TS EAMCET 2019 · 4 May · Shift 1 MCQ

A Carnot engine with efficiency η operates between two heat reservoirs with temperatures T_1 and T_2 where $T_1 > T_2$. If only T_1 is changed by 0.4%, the change in efficiency is $\Delta\eta_1$, whereas if only T_2 is changed by 0.2%, the efficiency is changed by $\Delta\eta_2$. The ratio $\frac{\Delta\eta_1}{\Delta\eta_2}$ is approximately

(A) -2
(B) -4
(C) $+3$
(D) $+4$

Answer: (A) -2 · Official TGCHE final key

Q224 TS EAMCET 2019 · 4 May · Shift 2 MCQ

An ideal gas at initial temperature T_0 and initial volume V_0 is expanded adiabatically to a volume $2V_0$. The gas is then expanded isothermally to a volume $5V_0$ and thereafter compressed adiabatically so that the temperature of the gas becomes again T_0. If the final volume of the gas is αV_0, then the value of constant α is

(A) 2.5
(B) 1.5
(C) 2.0
(D) 3.0

Answer: (A) 2.5 · Official TGCHE final key

Q225 TS EAMCET 2019 · 3 May · Shift 1 MCQ

One mole of nitrogen gas being initially at a temperature of $T_0 = 300$ K is adiabatically compressed to increase its pressure 10 times. The final gas temperature after compression is (Assume nitrogen gas molecules as rigid diatomic and $100^{1/7} = 1.9$)

(A) 420 K
(B) 750 K
(C) 650 K
(D) 570 K

Answer: (D) 570 K · Official TGCHE final key

Q226 TS EAMCET 2019 · 3 May · Shift 2 MCQ

One mole of ideal gas goes through a process PV^3 = constant, where P and V are pressure and volume respectively. Let W be the work done by the gas as its temperature is increased by ΔT. The value of $|W|$ is (R is the universal gas constant)

(A) $R\Delta T$
(B) $\frac{1}{4}R\Delta T$
(C) $R^3\Delta T$
(D) $\frac{R}{2}\Delta T$

Answer: (D) $\frac{R}{2}\Delta T$ · Official TGCHE final key

Q227 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

Two heat engines X and Y of same efficiency are connected in series in such a way that the sink of X works as source of Y. X receives heat at $900\ \mathrm{K}$ and rejects some heat to its sink at $T\ \mathrm{K}$ and in turn Y rejects heat to its sink at $400\ \mathrm{K}$, then the temperature T is

(A) $550\ \mathrm{K}$
(B) $600\ \mathrm{K}$
(C) $650\ \mathrm{K}$
(D) $700\ \mathrm{K}$

Answer: (B) $600\ \mathrm{K}$ · Official APSCHE final key

Q228 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

The specific heat capacities of an ideal gas at constant pressure and at constant volume are $620\ \mathrm{Jkg^{-1}K^{-1}}$ and $420\ \mathrm{Jkg^{-1}K^{-1}}$ respectively. The density of the gas at STP is approximately

(A) $2.88\ \mathrm{kg\,m^{-3}}$
(B) $4.86\ \mathrm{kg\,m^{-3}}$
(C) $3.88\ \mathrm{kg\,m^{-3}}$
(D) $1.86\ \mathrm{kg\,m^{-3}}$

Answer: (D) $1.86\ \mathrm{kg\,m^{-3}}$ · Official APSCHE final key

Q229 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

Which of the following statements is correct regarding P-V graph?

a) Slope of P-V graph in an isothermal process is $-\frac{P}{V}$

b) Slope of P-V graph in an adiabatic process is $-\frac{P}{V}$

c) Slope of P-V graph in an isochoric process is $-\frac{\gamma P}{V}$

d) Slope of P-V graph in an isobaric process is zero

(A) a, c, d are correct
(B) b, c are correct
(C) a, d are correct
(D) b, c, d are correct

Answer: (C) a, d are correct · Official APSCHE final key

Q230 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

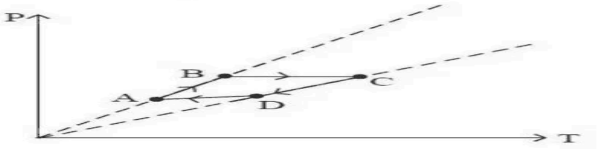
Three moles of an ideal monatomic gas performs a cycle ABCDA as shown in the figure. The temperatures of the gas at the states A, B, C and D are 400 K, 800 K, 2400 K and 1200 K respectively. The workdone by the gas during this cycle is (R - universal gas constant)

(see the figure above)

Question Number : 97 Question Id : 1874634417 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Three moles of an ideal monatomic gas performs a cycle ABCDA as shown in the figure. The temperatures of the gas at the states A, B, C and D are 400 K, 800 K, 2400 K and 1200 K respectively. The workdone by the gas during this cycle is
(R - universal gas constant)

మూడు మోల్‌ల ఏకపరమాణుక ఆదర్శవాయువు రెండు రుద్ధ ప్రక్రియ ప్రక్రియ పటములో చూపిన విధంగా ABCDA వెంబడి ఉంటుంది. A, B, C, D స్థితుల వద్ద వాయువు ఉష్ణోగ్రతలు వరుసగా 400 K, 800 K, 2400 K మరియు 1200 K. ఈ ప్రక్రియలో వాయువు చేసిన పని
(R-సార్వత్రిక వాయు స్థిరాంకం)



Options :
1. 1200 R
2. 3600 R
3. 2400 R
4. 2000 R

(A) 1200 R
(B) 3600 R
(C) 2400 R
(D) 2000 R

Answer: (C) 2400 R · Official APSCHE final key

Q231 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

An insulated system contains 4 moles of an ideal diatomic gas at temperature T. When a heat 'Q' is supplied to the gas, 2 moles of the gas is dissociated into atoms and the temperature remained constant. Then the relation between Q and T is (R - Universal gas constant)

(A) $Q = RT$
(B) $Q = 2RT$
(C) $Q = 3RT$
(D) $Q = 4RT$

Answer: (A) $Q = RT$ · Official APSCHE final key

Q232 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

A gas ($\gamma = 1.5$) undergoes a cycle of adiabatic, isobaric and isochoric processes in an order. If the volume of the gas is doubled in the adiabatic process then the efficiency of the cycle is approximately

(A) 18%
(B) 46.4%
(C) 38.5%
(D) 9.25%

Answer: (A) 18% · Official APSCHE final key

Q233 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

Match the temperatures of the source and sink (T_1 and T_2 respectively) of a Carnot heat engine given in List-I with the corresponding efficiencies given in List-II.

List-I

A) $T_1 = 500\,\mathrm{K}, T_2 = 300\,\mathrm{K}$
B) $T_1 = 500\,\mathrm{K}, T_2 = 350\,\mathrm{K}$
C) $T_1 = 800\,\mathrm{K}, T_2 = 400\,\mathrm{K}$
D) $T_1 = 450\,\mathrm{K}, T_2 = 360\,\mathrm{K}$

List-II

I) 0.2
II) 0.3
III) 0.4
IV) 0.5

The correct answer is

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

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

Q234 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

A Carnot engine of efficiency 40%, takes heat from a source maintained at a temperature of 500 K. It is desired to have an engine of efficiency 60%. Then, the source temperature for the same sink temperature must be

(A) 650 K
(B) 750 K
(C) 550 K
(D) 850 K

Answer: (B) 750 K · Official APSCHE final key

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Q235 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

A gas expands with temperature according to the relation $V = kT^{2/3}$, where k is a constant. Work done when the temperature changes by 60 K is
(R-Universal gas constant)

(A) 10 R
(B) 20 R
(C) 50 R
(D) 40 R

Answer: (D) 40 R · Official APSCHE final key

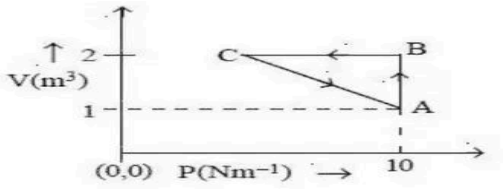
Q236 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

An ideal gas is taken through the cycle $A \to B \to C \to A$ as shown in the figure. If the net heat supplied to the gas in the cycle is 5 J, the magnitude of work done during the process $C \to A$ is
(see the figure above)

Question Number : 98 Question Id : 1874633778 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An ideal gas is taken through the cycle A → B → C → A as shown in the figure. If the net heat supplied to the gas in the cycle is 5 J, the magnitude of work done during the process C → A is

ఒక ఆదర్శ వాయువును పటంలో చూపినట్లు A → B → C → A ప్రక్రియలో తీసుకుని వెళ్ళారు. ఈ ప్రక్రియలో వాయువుకు అందించిన నికర ఉష్ణం 5 J. అయితే, C → A ప్రక్రియలో జరిగిన పని పరిమాణం



Options :

1. 5 J
2. 10 J
3. 15 J
4. 20 J

(A) 5 J
(B) 10 J
(C) 15 J
(D) 20 J

Answer: (A) 5 J · Official APSCHE final key

Q237 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

Five moles of Hydrogen gas initially at STP is compressed adiabatically so that its temperature becomes 673 K. The increase in internal energy of the gas is ($R = 8.3\ \text{Jmol}^{-1}\text{K}^{-1}$, $\gamma = 1.4$ for

diatomic gas)

(A) $80.5\ \text{kJ}$

(B) $21.55\ \text{kJ}$

(C) $41.50\ \text{kJ}$

(D) $65.55\ \text{kJ}$

Answer: (C) $41.50\ \text{kJ}$ · Official APSCHE final key

Q238 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

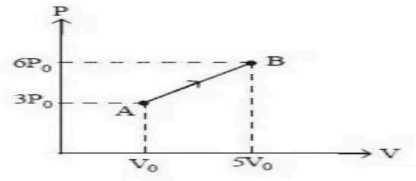
One mole of a monatomic ideal gas undergoes the process $\text{A} \rightarrow \text{B}$ in the given P-V diagram. Specific heat capacity in the process is

(see the figure above)

Question Number : 98 Question Id : 1874633938 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

One mole of a monatomic ideal gas undergoes the process A → B in the given P–V diagram. Specific heat capacity in the process is

ఒక మోల్ ఆదర్శ ఏక పరమాణుక వాయువు P–V పటంలో చూపిన విధంగా A → B ప్రక్రియకు లోనైనది. ప్రక్రియలో కలుగు విశిష్టోష్ణ సామర్థ్యము



Options :

1. $\frac{13R}{3}$
2. $\frac{13R}{6}$
3. $\frac{7R}{3}$
4. $\frac{2R}{3}$

(A) $\frac{13R}{3}$

(B) $\frac{13R}{6}$

(C) $\frac{7R}{3}$

(D) $\frac{2R}{3}$

Answer: (B) $\frac{13R}{6}$ · Official APSCHE final key

Q239 TS EAMCET 2018 · 7 May · Shift 1 MCQ

A diesel engine has a compression ratio of 20 : 1. If the initial pressure is 1×10^5 Pa and the initial volume of the cylinder is $1 \times 10^{-3}\ \text{m}^3$, how much work does the gas do during the compression? (Assume the process as adiabatic) ($C_v = 20.8$ J/mol K , $\gamma_{air} = 1.4$, $(20)^{1.4} = 66.3$)

(A) -880 J

(B) -579 J

(C) 220 J

(D) 485 J

Answer: (B) -579 J · The council's preliminary key

Q240 TS EAMCET 2018 · 5 May · Shift 1 MCQ

One mole of the ideal gas goes through the process $P = P_0\left[1 - \alpha\left(\frac{V}{V_0}\right)^3\right]$, where P and V are pressure and volume, P_0, V_0 and α are constants. If the maximum attainable temperature of the gas is $\left(\frac{3}{4}\right)\frac{P_0V_0}{R}$, then the value of α is :

(A) 2

(B) $\frac{1}{2}$

(C) $\frac{1}{4}$

(D) 4

Answer: (C) $\frac{1}{4}$ · The council's preliminary key

Q241 TS EAMCET 2018 · 5 May · Shift 2 MCQ

A Carnot engine absorbs heat from a reservoir maintained at temperature $1000\ K$. The engine rejects heat to a reservoir whose temperature is T. If the magnitude of absorbed heat is $400\ J$ and work performed is $300\ J$, then the value of T is

(A) $250\ K$

(B) $500\ K$

(C) $750\ K$

(D) $1750\ K$

Answer: (A) $250\ K$ · The council's preliminary key

Q242 TS EAMCET 2018 · 5 May · Shift 2 MCQ

The mean kinetic energy of monoatomic gas molecules under standard conditions is $\langle E_1\rangle$. If the gas is compressed adiabatically 8 times to its initial volume, the mean kinetic energy of gas molecules changes to $\langle E_2\rangle$. The ratio $\frac{\langle E_2\rangle}{\langle E_1\rangle}$ is

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(A) 2
(B) 4
(C) 6
(D) 8

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

Q243 TS EAMCET 2018 · 4 May · Shift 1 MCQ

A one mole of ideal gas goes through a process in which pressure P varies with volume V as $P = 3 - 9\left(\frac{V}{V_0}\right)^2$, where V_0 is a constant. The maximum attainable temperature by the ideal gas during this process is
(All quantities are in SI units and R is gas constant)

(A) $\frac{2V_0}{3R}$
(B) $\frac{2V_0}{R}$
(C) $\frac{3V_0}{2R}$
(D) $\frac{3V_0}{R}$

Answer: (A) $\frac{2V_0}{3R}$ · The council's preliminary key

Q244 TS EAMCET 2018 · 4 May · Shift 1 MCQ

The efficiency of carnot engine is η when its hot and cold reservoirs are maintained at temperature T_1 and T_2, respectively. To increase the efficiency to $1.5\,\eta$, the increase in temperature (ΔT) of the hot reservoir by keeping the cold one constant at T_2 is

(A) $\frac{T_1T_2}{(1-\eta)(1-1.5\eta)}$
(B) $\frac{0.5\,T_2\,\eta}{(1-1.5\eta)(1-\eta)}$
(C) $\frac{T_1}{1-\eta} - \frac{T_2}{1-1.5\eta}$
(D) $\frac{(1-\eta)(1-1.5\eta)}{T_1T_2}$

Answer: (B) $\frac{0.5\,T_2\,\eta}{(1-1.5\eta)(1-\eta)}$ · The council's preliminary key

Q245 TS EAMCET 2018 · 4 May · Shift 2 MCQ

An ideal gas has molar heat capacity C_v at constant volume. The gas undergoes a process wherein the temperature changes as $T = T_0(1 + \alpha V^2)$, where T and V are temperature and volume respectively, T_0 and α are positive constants. The molar heat capacity C of the gas is given as $C = C_v + Rf(V)$, where $f(V)$ is a function of volume. The expression for $f(V)$ is

(A) $\frac{\alpha V^2}{1+\alpha V^2}$
(B) $\frac{1+\alpha V^2}{2\alpha V^2}$
(C) $\alpha V^2(1+\alpha V^2)$
(D) $\frac{1}{2\alpha V^2(1+\alpha V^2)}$

Answer: (B) $\frac{1+\alpha V^2}{2\alpha V^2}$ · The council's preliminary key

Q246 TS EAMCET 2018 · 4 May · Shift 2 MCQ

An ideal gas in a cylinder is compressed adiabatically to one-third of its original volume. A work of 45 J is done on the gas by the process. The change in internal energy of the gas and the heat flowed into the gas, respectively are

(A) 45 J and zero
(B) -45 J and zero
(C) 45 J and heat flows out of the gas
(D) -45 J and heat flows into the gas

Answer: (A) 45 J and zero · The council's preliminary key

Q247 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

A reversible Carnot heat engine converts $\frac{1}{4}$th of its input heat into work. When the temperature of the sink is reduced by 50 K, its efficiency becomes $33\frac{1}{3}\%$. The initial temperatures of the source and the sink respectively are

(A) 600 K, 550 K
(B) 600 K, 450 K
(C) 300 K, 150 K
(D) 450 K, 350 K

Answer: (B) 600 K, 450 K · The council's preliminary key

Q248 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

An ideal monatomic gas is carried along the cycle ABCDA as shown in the figure. The total heat absorbed during this process is

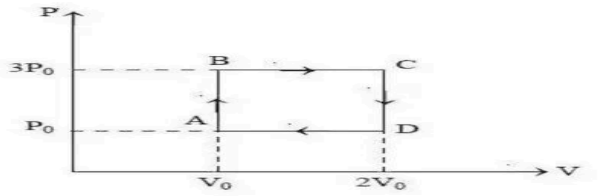
(see the figure above)

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Question Number : 98 Question Id : 4557344418 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An ideal monatomic gas is carried along the cycle ABCDA as shown in the figure. The total heat absorbed during this process is

ఒక ఆదర్శ ఏక పరమాణుక వాయువు ABCDA చక్రం వెంబడి పటంలో చూపినట్లుగా తీసుకువెళ్ళబడుతుంది. ఈ ప్రక్రియలో శోషణం కాబడిన మొత్తం ఉష్ణం



Options :

1. $10.5\ P_0V_0$
2. $7.5\ P_0V_0$
3. $2.5\ P_0V_0$
4. $1.5\ P_0V_0$

(A) $10.5\ P_0V_0$

(B) $7.5\ P_0V_0$

(C) $2.5\ P_0V_0$

(D) $1.5\ P_0V_0$

Answer: (A) $10.5\ P_0V_0$ · The council's preliminary key

Q249 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

Hydrogen gas is undergoing a process given by $PV^2 =$ constant. The ratio of work done by the gas to the change in its internal energy is _____

(A) $\frac{2}{3}$

(B) 0.4

(C) 1.5

(D) -0.4

Answer: (D) -0.4 · The council's preliminary key

Q250 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

$2.8\ \text{g}$ of nitrogen gas is in a vessel at a temperature $127\ ^\circ\text{C}$. The amount of heat energy required to increase the rms speed of the nitrogen molecules by 41.4% is _____
$(R = 8.31\ \text{J mol}^{-1}\text{K}^{-1})$

(A) $376\ \text{J}$
(B) $415\ \text{J}$
(C) $1662\ \text{J}$
(D) $831\ \text{J}$

Answer: (D) $831\ \text{J}$ · The council's preliminary key

Q251 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

Freezing compartment of a refrigerator is at $0\ ^\circ\text{C}$ and room temperature is $27.3\ ^\circ\text{C}$. Work done by the refrigerator to freeze 1 g of water at $0\ ^\circ\text{C}$ is
$(\text{L}_{\text{ice}} = 80\ \text{cal}\,\text{g}^{-1})$

(A) 336 J
(B) 33.6 J
(C) 3.36 J
(D) 40 J

Answer: (B) 33.6 J · The council's preliminary key

Q252 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

Assertion (A) : A room can be cooled by opening the door of a refrigerator in it.
Reason (R) : Heat always flows from a body at higher temperature to a body at lower temperature.

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

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

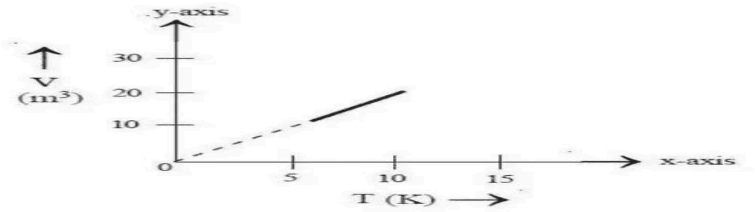
Q253 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

A graph drawn between absolute temperature and volume of 3 moles of helium gas as shown in the figure. If 5 cal of heat is used in the process, then the work done is *(see the figure above)*

Question Number : 97 Question Id : 4557344257 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A graph drawn between absolute temperature and volume of 3 moles of helium gas as shown in the figure. If 5 cal of heat is used in the process, then the work done is

3 మోల్‌ల హీలియం వాయువు పరమ ఉష్ణోగ్రతకు మరియు ఘన పరిమాణానికి మధ్య గీసిన గ్రాఫ్ పటంలో చూపిన విధంగా ఉంది. ఈ ప్రక్రియలో 5 కెలరీల ఉష్ణము ఉపయోగించినట్లయిన, జరిగిన పని



Options :
1. 21.0 J
2. 8.4 J
3. 12.6 J
4. 6.2 J

(A) 21.0 J

(B) 8.4 J

(C) 12.6 J

(D) 6.2 J

Answer: (B) 8.4 J · The council's preliminary key

Q254 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

An ideal gas is found to obey $PV^{\frac{3}{2}} =$ constant during an adiabatic process. If such a gas initially at a temperature T is adiabatically compressed to half of its initial volume, then its final temperature is

(A) $\sqrt{2}T$

(B) $2T$

(C) $2\sqrt{2}T$

(D) $4T$

Answer: (A) $\sqrt{2}T$ · The council's preliminary key

Q255 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

A thermally insulated vessel with nitrogen gas at $27\ ^{\circ}\mathrm{C}$ is moving with a velocity of $100\ \mathrm{ms}^{-1}$. If the vessel is stopped suddenly, the percentage change in the pressure of the gas is nearly
(Assume entire loss in KE of the gas is given as heat to gas and $R = 8.3\ \mathrm{Jmol}^{-1}\mathrm{K}^{-1}$)

(A) 1.1
(B) 0.93
(C) 0.5
(D) 2.25

Answer: (D) 2.25 · The council's preliminary key

Q256 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

Match the following :
List - I
A) Zeroth law of Thermodynamics
B) First law of thermodynamics
C) Free expansion of a gas
D) Second law of Thermodynamics
List - II
I) Direction of flow of heat
II) Work done is zero
III) Thermal equilibrium
IV) Law of conservation of energy
The correct answer is

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

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

Q257 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

A cylindrical vessel of uniform cross section consisting of a gas of $\gamma = 1.5$ is divided into two parts A and B using a piston. Initially the piston is kept fixed such that part A has pressure P and volume 5 V and the part B has pressure 8 P and volume V. If the piston is let free and the gas is allowed to undergo adiabatic process, the final volume of the gas in part A is _____

(A) $3\,V$
(B) $\frac{8}{3}V$
(C) $\frac{10}{3}V$
(D) $\frac{13}{3}V$

Answer: (C) $\frac{10}{3}V$ · The council's preliminary key

EdLoop EAPCET

Q258 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

A diatomic ideal gas is used in Carnot's engine as working substance. During adiabatic expansion of the cycle, if the volume of the gas increases from V to 32V then the efficiency of the engine is

(A) 0.25
(B) 0.5
(C) 0.67
(D) 0.75

Answer: (D) 0.75 · The council's preliminary key

Q259 TS EAMCET 2017 · 12 May · Offline MCQ

Consider a reversible engine of efficiency $\frac{1}{6}$. When the temperature of the sink is reduced by $62\,^{\circ}$C, its efficiency gets doubled. The temperature of the source and sink respectively are

(A) 372 K and 310 K
(B) 273 K and 300 K
(C) $99\,^{\circ}$C and $10\,^{\circ}$C
(D) $200\,^{\circ}$C and $37\,^{\circ}$C

Answer: (A) 372 K and 310 K · The council's preliminary key

Q260 TS EAMCET 2017 · 12 May · Offline MCQ

An office room contains about 2000 moles of air. The change in the internal energy of this much air when it is cooled from $34\,^{\circ}$C to $24\,^{\circ}$C at a constant pressure of 1.0 atm is
[Use $\gamma_{\text{air}} = 1.4$ and Universal gas constant = 8.314 J/mol K]

(A) -1.9×10^5 J
(B) $+1.9 \times 10^5$ J
(C) -4.2×10^5 J
(D) $+0.7 \times 10^5$ J

Answer: (C) -4.2×10^5 J · The council's preliminary key

Q261 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

One mole of a gas expands such that its volume 'V' changes with absolute temperature 'T' in accordance with the relation $V = KT^2$ where 'K' is a constant. If the temperature of the gas changes by $60\,^{\circ}$C, then work done by the gas (R is universal gas constant)

(A) $120\,R$

(B) $R \ln 60$

(C) $KR \ln 60$

(D) $40\,KR$

Answer: (A) $120\,R$ · The council's preliminary key

Q262 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

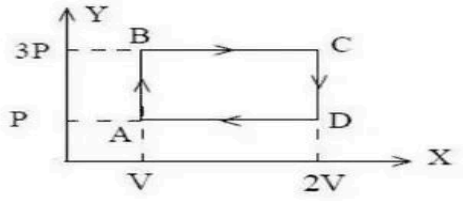
A monoatomic ideal gas goes through a cyclic process as shown in the figure. The efficiency of this process is

(see the figure above)

Question Number : 98 Question Id : 1017174578 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A monoatomic ideal gas goes through a cyclic process as shown in the figure. The efficien of this process is

పటంలో చూపబడినట్లు ఒక ఏకపరమాణుక ఆదర్శ వాయువు చక్రీయ ప్రక్రియకు లోనైతే, ఈ ప్రక్రి దక్షత



Options :

1. 78%
2. 62%
3. 42%
4. 21%

(A) 78%

(B) 62%

(C) 42%

(D) 21%

Answer: (D) 21% · The council's preliminary key

Q263 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

Two moles of helium gas $\left(\gamma = \frac{5}{3}\right)$ at $27\ ^\circ\mathrm{C}$ is expanded at constant pressure until its volume is doubled. Then it undergoes an adiabatic change until the temperature returns to its initial value. The work done during adiabatic process is _____

(universal gas constant $= 8.3\ \mathrm{J\,mol^{-1}\,K^{-1}}$)

(A) 7470 J
(B) 7070 J
(C) 4770 J
(D) 4077 J

Answer: (A) 7470 J · The council's preliminary key

Q264 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

On tripling the absolute temperature of the source, the efficiency of a Carnot's heat engine becomes double that of the initial efficiency. Then the initial efficiency of the engine is _____

(A) 20%
(B) 50%
(C) 60%
(D) 40%

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

Q265 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

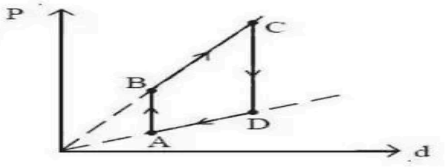
Pressure (P) versus density (d) graph of an ideal gas is shown in the figure. Choose the correct statement.

(see the figure above)

Question Number : 98 Question Id : 1017174258 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Pressure (P) versus density (d) graph of an ideal gas is shown in the figure. Choose t correct statement.

ఒక ఆదర్శ వాయువు యొక్క పీడనము (P) మరియు సాంద్రత (d) గ్రాపు పటములో చూపబడిన క్రింది వానిలో సరియైన ప్రవచనాన్ని గుర్తించుము.



Options :

1. During the process AB, workdone by the gas is positive
AB ప్రక్రియలో వాయువు చేసిన పని ధనాత్మకం

2. During the process AB, workdone by the gas is negative
AB ప్రక్రియలో వాయువు చేసిన పని ఋణాత్మకం

3. During the process BC, internal energy of the gas increases
BC ప్రక్రియలో వాయువు అంతర్గత శక్తి పెరుగును

4. During the process DA, internal energy of the gas remains constant
DA ప్రక్రియలో వాయువు అంతర్గత శక్తి స్థిరము

(A) During the process AB, workdone by the gas is positive
(B) During the process AB, workdone by the gas is negative
(C) During the process BC, internal energy of the gas increases
(D) During the process DA, internal energy of the gas remains constant

Answer: (D) During the process DA, internal energy of the gas remains constant · The council's preliminary key

Q266 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

5.6 litre of helium gas at STP is adiabatically compressed to 0.7 litre. If the initial temperature of the gas is T K, work done in the process is (R is universal gas constant in SI units)

(A) $\frac{9}{8}RT$
(B) $-\left(\frac{9}{8}RT\right)$
(C) $-\left(\frac{4}{3}RT\right)$
(D) $\frac{3}{4}RT$

Answer: (B) $-\left(\frac{9}{8}RT\right)$ · The council's preliminary key

Q267 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

Match the following
List - I
i) Isothermal process
ii) Isobaric process
iii) Isochoric process
iv) Adiabatic process
List - II
a) 0
b) $\frac{1}{\gamma-1}[P_2V_2-P_1V_1]$
c) $\mu RT\ln\left(\frac{V_2}{V_1}\right)$
d) $P(V_2-V_1)$
The correct answer is

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

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

EdLoop EAPCET

Q268 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

A gas is governed by an equation $V = \frac{aT^3}{P}$ where P, V and T are pressure, volume and temperature of the gas respectively and 'a' is a constant. If the temperature of the gas is doubled at constant pressure then the workdone by the gas is

(A) $6aT^3$
(B) $8aT^3$
(C) $9aT^3$
(D) $7aT^3$

Answer: (D) $7aT^3$ · The council's preliminary key

Q269 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

For 1 mole of an ideal gas, during an adiabatic process, the square of the pressure of a gas is found to be proportional to the cube of its absolute temperature. The specific heat of the gas at constant volume is (R is universal gas constant)

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

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

Q270 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

200 cc of an ideal gas ($\gamma = 1.5$) expands adiabatically. If the rms speed of the gas molecules becomes half of the initial value, the final volume of the gas is

(A) 900 cc
(B) 1600 cc
(C) 2700 cc
(D) 3200 cc

Answer: (D) 3200 cc · The council's preliminary key

Q271 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

One mole of an ideal gas expands adiabatically from 200 K to 250 K. If the specific heat of the gas at constant volume is $0.8\ \text{kJ kg}^{-1}\ \text{K}^{-1}$, then the work done by the gas is

(A) 20 J
(B) 20 kJ
(C) 40 J
(D) 40 kJ

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

Q272 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

The internal energy of an ideal gas is given by $U = 1.5\ PV$. It expands from $10\ \text{cm}^3$ to $20\ \text{cm}^3$ against a constant pressure of 2×10^5 Pa. Heat absorbed by the gas in the process is

(A) 2 J
(B) 5 J
(C) 3 J
(D) 7 J

Answer: (B) 5 J · The council's preliminary key

Q273 TS EAMCET 2016 · 15 May · Offline MCQ

Two moles of a gas is expanded to double its volume by two different processes. One is isobaric and the other is isothermal. If w_1 and w_2 are the works done respectively, then

(A) $w_2 = \frac{w_1}{\ln 2}$
(B) $w_2 = w_1$
(C) $w_2 = w_1 \ln 2$
(D) $w_1^2 = w_2 \ln 2$

Answer: (C) $w_2 = w_1 \ln 2$ · Official TGCHE final key

Q274 AP EAMCET 2016 · 29 Apr · Offline MCQ

A diatomic gas ($\gamma = 1.4$) does 300 J work when it is expanded isobarically. The heat given to the gas in this process is

(A) $1050\ \text{J}$
(B) $950\ \text{J}$
(C) $600\ \text{J}$
(D) $550\ \text{J}$

Answer: (A) $1050\ \text{J}$ · The council's preliminary key

Q275 AP EAMCET 2016 · 29 Apr · Offline MCQ

When the absolute temperature of the source of a Carnot heat engine is increased by 25%, its efficiency increases by 80%. The new efficiency of the engine is

(A) 12%
(B) 24%
(C) 48%
(D) 36%

Answer: (D) 36% · The council's preliminary key

Q276 AP EAMCET 2014 · 22 May · Offline MCQ

Five moles of Hydrogen initially at STP is compressed adiabatically so that its temperature becomes 673 K. The increase in internal energy of the gas, in Kilo Joules is (R = 8.3 J/mole-K; γ = 1.4 for diatomic gas)

(A) 80.5
(B) 21.55
(C) 41.50
(D) 65.55

Answer: (C) 41.50 · The council's preliminary key

Q277 AP EAMCET 2014 · 22 May · Offline MCQ

The volume of one mole of the gas is changed from V to 2 V at constant pressure P. If γ is the ratio of specific heats of the gas, change in internal energy of the gas is

(A) $\frac{r \cdot PV}{\gamma - 1}$
(B) $\frac{R}{\gamma - 1}$
(C) PV
(D) $\frac{PV}{\gamma - 1}$

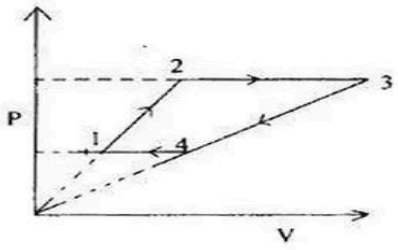
Answer: (D) $\frac{PV}{\gamma - 1}$ · The council's preliminary key

Q278 AP EAMCET 2013 · 10 May · Offline MCQ

Three moles of an ideal monoatomic gas undergoes a cyclic process as shown in the figure. The temperature of the gas in different states marked as 1, 2, 3 and 4 are 400 K, 700 K, 2500 K and 1100 K respectively. The work done by the gas during the process 1-2-3-4-1 is (Universal gas constant R)
(see the figure above)

98. Three moles of an ideal monoatomic gas undergoes a cyclic process as shown in the figure. The temperature of the gas in different states marked as 1, 2, 3 and 4 are 400 K, 700 K, 2500 K and 1100 K respectively. The work done by the gas during the process 1–2–3–4–1 is (Universal gas constant R)

పటములో చూపించిన విధంగా, 3 మోల్‌ల ఆదర్శ ఏక పరమాణు వాయువు ఒక చక్రీయ ప్రక్రియ జరుపుతోంది. 1, 2, 3 మరియు 4గా గుర్తించబడిన వేరు వేరు స్థితుల వద్ద వాయువు ఉష్ణోగ్రతలు వరుసగా 400 K, 700 K, 2500 K మరియు 1100 K. ప్రక్రియ 1–2–3–4–1 జరుగుతున్నప్పుడు వాయువు చేసిన పని, (సార్వత్రిక వాయు స్థిరాంకము R)



(1) 1650 R
(2) 550 R
(3) 1100 R
(4) 2200 R

(A) 1650 R
(B) 550 R
(C) 1100 R
(D) 2200 R

Answer: (A) 1650 R · The council's preliminary key

Q279 AP EAMCET 2013 · 10 May · Offline MCQ

Efficiency of a heat engine whose sink is at a temperature of 300 K is 40%. To increase the efficiency to 60%, keeping the sink temperature constant, the source temperature must be increased by

(A) 750 K
(B) 500 K
(C) 250 K
(D) 1000 K

Answer: (C) 250 K · The council's preliminary key

Q280 AP EAMCET 2012 · 12 May · Offline MCQ

A sound wave passing through an ideal gas at NTP produces a pressure change of $0.001\ \text{dyne/cm}^2$ during adiabatic compression. The corresponding change in temperature ($\gamma = 1.5$ for the gas and atmospheric pressure is $1.013 \times 10^6\ \text{dynes/cm}^2$) is

(A) 8.97×10^{-4} K
(B) 8.97×10^{-6} K
(C) 8.97×10^{-8} K
(D) 8.97×10^{-9} K

Answer: (C) 8.97×10^{-8} K · Official APSCHE final key

Q281 AP EAMCET 2012 · 12 May · Offline MCQ

Work done to increase the temperature of one mole of an ideal gas by 30°C, if it is expanding under the condition $V \propto T^{2/3}$ is, (R = 8.314 J/mole/°K)

(A) 116.2 J
(B) 136.2 J
(C) 166.2 J
(D) 186.2 J

Answer: (C) 166.2 J · Official APSCHE final key

Q282 AP EAMCET 2011 · 8 May · Offline MCQ

A reversible engine converts one-sixth of the heat supplied into work. When the temperature of the sink is reduced by $62^{\circ}\mathrm{C}$, the efficiency of the engine is doubled. The temperatures of the source and sink are :

(A) $99^{\circ}\mathrm{C}, 37^{\circ}\mathrm{C}$
(B) $80^{\circ}\mathrm{C}, 37^{\circ}\mathrm{C}$
(C) $95^{\circ}\mathrm{C}, 37^{\circ}\mathrm{C}$
(D) $90^{\circ}\mathrm{C}, 37^{\circ}\mathrm{C}$

Answer: (A) $99^{\circ}\mathrm{C}, 37^{\circ}\mathrm{C}$ · The council's preliminary key

Q283 AP EAMCET 2011 · 8 May · Offline MCQ

During an adiabatic process, the pressure of a gas is proportional to the cube of its temperature. The value of C_p/C_v for that gas is :

(A) $\frac{7}{5}$
(B) $\frac{4}{5}$
(C) $\frac{5}{3}$
(D) $\frac{3}{2}$

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

Q284 AP EAMCET 2010 · 30 May · Offline MCQ

An ideal gas expands isothermally from volume V_1 to volume V_2. It is then compressed to the original volume V_1 adiabatically. If P_1, P_2 and W represent the initial pressure, final pressure and the

net work done by the gas respectively during the entire process, then :

(A) $P_1 > P_2$, W = 0

(B) $P_1 > P_2$, W > 0

(C) $P_2 > P_1$, W > 0

(D) $P_2 > P_1$, W < 0

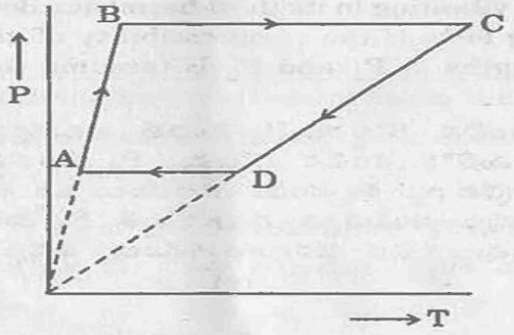
Answer: (D) $P_2 > P_1$, W < 0 · Official APSCHE final key

Q285 AP EAMCET 2010 · 30 May · Offline MCQ

3 moles of an ideal monoatomic gas performs ABCDA cyclic process as shown in figure below. The gas temperatures are T_A = 400 K, T_B = 800 K, T_C = 2400 K and T_D = 1200 K. The work done by the gas is (approximately) (R = 8.314 J/mole K) :

(see the figure above)

99. 3 moles of an ideal monoatomic gas performs ABCDA cyclic process as shown in figure below. The gas temperatures are T_A = 400 K, T_B = 800 K, T_C = 2400 K and T_D = 1200 K. The work done by the gas is (approximately) (R = 8.314 J/mole K) :
3 మోల్‌ల ఏక పరమాణు ఆదర్శ వాయువు క్రింది పటములో చూపబడినట్లు ABCDA చక్రీయ ప్రక్రియ చేస్తుంది. వాయువు ఉష్ణోగ్రతలు వరుసగా T_A = 400 K, T_B = 800 K, T_C = 2400 K మరియు T_D = 1200 K. వాయువు చేసే పని (సుమారుగా) (R = 8.314 J/mole K) :



(1) 10 kJ (2) 20 kJ

(3) 40 kJ (4) 100 kJ

(A) 10 kJ

(B) 20 kJ

(C) 40 kJ

(D) 100 kJ

Answer: (B) 20 kJ · Official APSCHE final key