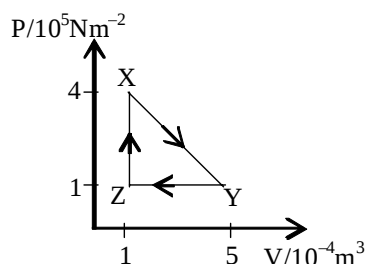
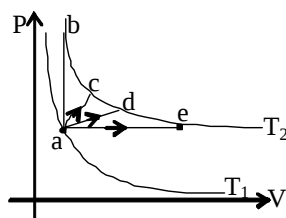


1. A mass of an ideal gas of volume V at pressure P undergoes the cycle of changes shown in the graph

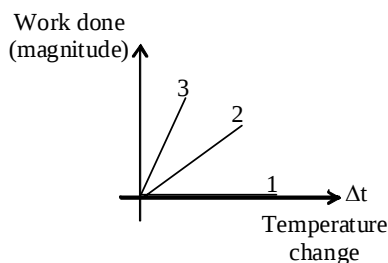


At which point is the gas coolest and hottest ?

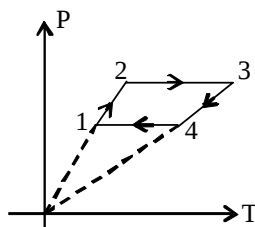
- (A) Coolest X hottest Y (B) Coolest Y hottest X
(C) Coolest Y hottest Z (D) Coolest Z hottest Y
2. The figure shows two isotherms at temperatures T_1 & T_2 . A gas is taken from one isotherm to another isotherm through different processes. Then change in internal energy ΔU has relation

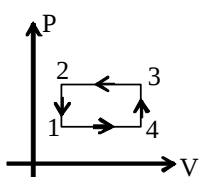
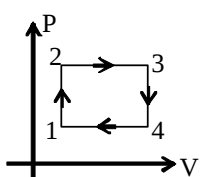
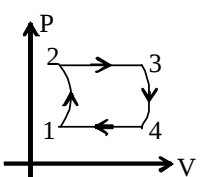
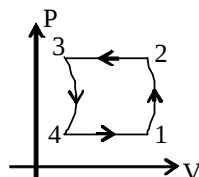


- (A) $\Delta U_{ab} > \Delta U_{ac} > \Delta U_{ad} > \Delta U_{ae}$ (B) $\Delta U_{ab} = \Delta U_{ac} > \Delta U_{ad} > \Delta U_{ae}$
(C) $\Delta U_{ab} = \Delta U_{ac} = \Delta U_{ad} = \Delta U_{ae}$ (D) $\Delta U_{ab} < \Delta U_{ac} < \Delta U_{ad} < \Delta U_{ae}$
3. For an ideal gas graph is shown for three processes. Processes 1, 2 and 3 are respectively

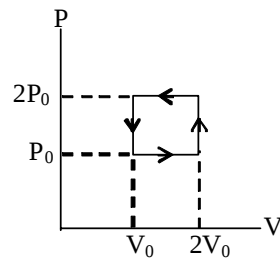


- (A) Isochoric, isobaric, adiabatic (B) Isochoric, adiabatic, isobaric
(C) Isobaric, adiabatic, isochoric (D) Adiabatic, isobaric, isochoric
4. P-T graph of ideal monoatomic gas is given as shown in figure. The corresponding P-V diagram is

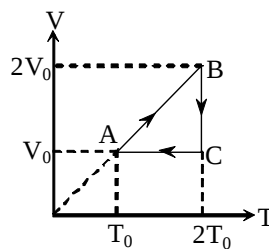


- (A)  (B)  (C)  (D) 

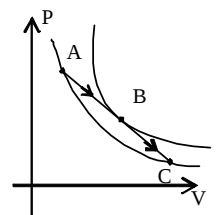
5. In Figure, an ideal gas is carried around the cyclic process. How much work is done in one cycle if $P_0 = 8\text{ atm}$ and $V_0 = 7.00\text{ liters}$.



- (A) 5656 J (B) -5656 J (C) 10,600 J (D) 11,300 J
6. An ideal mono-atomic gas undergoes a cyclic process ABCA as shown in the figure. The ratio of heat absorbed during AB to the work done on the gas during BC is



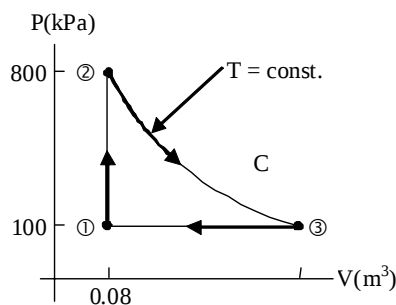
- (A) $\frac{5}{2\ln 2}$ (B) $\frac{5}{3}$ (C) $\frac{5}{4\ln 2}$ (D) $\frac{5}{6}$
7. An ideal gas is taken from initial state A through state B to state C. The two curves shown are isotherms. Then
- (A) Temperature of gas first decreases and then increases
 (B) Internal energy of gas first increases and then decreases
 (C) Temperature first increases and then decreases.
 (D) Internal energy of gas first decreases and then increases.



8. A system undergoes a cycle consisting of the three process listed in the table. Compute the missing values. All quantities are in kJ.

Process	Q	W	E
1 → 2	a	100	100
2 → 3	b	- 50	c
3 → 1	100	d	- 200

9. For the cycle in figure find the work output and the net heat transfer if the 0.1 kg of air is contained in a piston-cylinder arrangement.



Answers

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1. (D) 2. (C) 3. (B) 4. (B) 5. (B) 6. (C) 7. (BC)
8. $a = 200 \text{ kJ}$ $d = 300 \text{ kJ}$ $b = 50 \text{ kJ}$ $c = 100 \text{ kJ}$ 9. 77.1 kJ