



DPP – 1 (Thermodynamics)

Video Solution on Website:-

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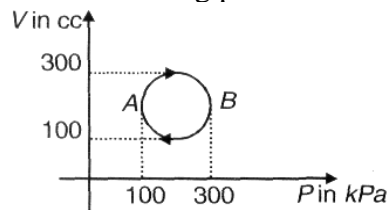
Video Solution on YouTube:-

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Written Solution on Website:-

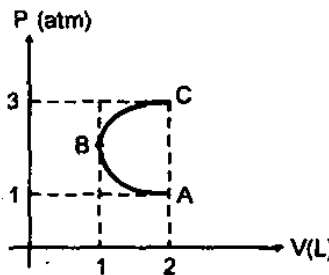
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Q 1. Calculate heat absorbed during process ABA given in figure?



- (a) 3.14 J (b) 314 J
(c) 31.4 J (d) None of these

Q 2. In the P-V diagram shown in figure ABC is a semicircle. The work done in the process ABC is:



- (a) zero (b) $\frac{\pi}{2}$ atm-L
(c) $-\frac{\pi}{2}$ atm-L (d) 4 atm-L

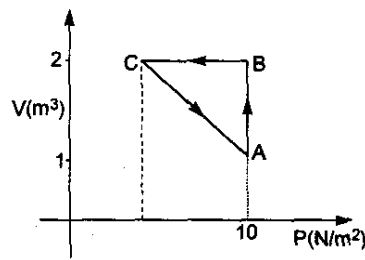
Q 3. Pressure P , volume V and temperature T of a certain real gas are related by $P = \frac{\alpha T^2}{V}$. Here, α is a constant. The work done by the real gas when temperature changes from T_0 to $2T_0$ while pressure remains constant is:

- (a) $6\alpha T_0^3$ (b) $\frac{3}{2}\alpha T_0^2$
(c) $2\alpha T_0^2$ (d) $3\alpha T_0^2$

Q 4. n moles of an ideal gas undergo a process in which the temperature changes with volume as $T = KV^2$. The work done by the gas as the temperature changes from T_0 to $4T_0$ is:-

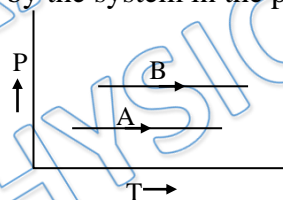
- (a) $3nRT_0$ (b) $(5/2)nRT_0$
(c) $(3/2)nRT_0$ (d) zero

Q 5. If pressure is 5 pascal at C and 10 pascal at B the work done by the gas in the process $C \rightarrow A$ is:

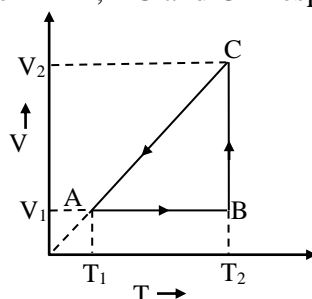


- (a) -7.5 J (b) -10 J
 (c) -15 J (d) -20 J

- Q 6. Find the amount of work done to increase the temperature of one mole of an ideal gas by 30°C , if it is expanding according to $V \propto T^{2/3}$.
- (a) 167J (b) 132J
 (c) 67J (d) None of the above
- Q 7. An ideal gas is taken from the state A (pressure P , volume V) to the state B (pressure $P/2$, volume $2V$) along a straight line path on the P-V diagram select the statement (s) from the following
- (a) the work done by the gas is the in the process A to B exceeds the work the taken from A to B along an isotherm.
 (b) in the T-V diagram the path AB becomes part of a parabola.
 (c) in the P-T diagram, the path AB becomes a part of a hyperbola
 (d) in going from A to B, the temperature T of the gas first increases to a maximum value and then decreases.
- Q 8. Consider the two process on a system as shown in figure. The volumes in the initial state and in the final state are the same in the two process A and B. If W_1 and W_2 be the work done by the system in the processes A and B respectively then-



- (a) $W_1 > W_2$
 (b) $W_1 = W_2$
 (c) $W_1 < W_2$
 (d) Nothing can be said about the relation between W_1 and W_2
- Q 9. A cyclic process for 1 mole of an ideal gas is shown in figure in the V-T. diagram. The work done in AB, BC and CA respectively –



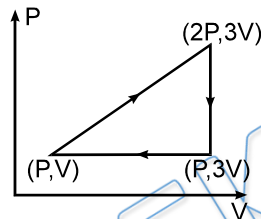


- (a) $0, RT_2 \ln\left(\frac{V_1}{V_2}\right), R(T_1 - T_2)$
- (b) $R(T_1 - T_2), 0, RT_1 \ln\left(\frac{V_1}{V_2}\right)$
- (c) $0, RT_2 \ln\left(\frac{V_2}{V_1}\right), R(T_1 - T_2)$
- (d) $0, RT_2 \ln\left(\frac{V_2}{V_1}\right), R(T_2 - T_1)$

Q 10. A gas is expanded to double its volume by two different processes. One is isobaric and the other is isothermal. Let W_1 and W_2 be the respective work done, then:

- (a) $W_2 = W_1 \ln(2)$
- (b) $W_2 = \frac{W_1}{\ln(2)}$
- (c) $W_2 = \frac{W_1}{2}$
- (d) data is insufficient

Q 11. An ideal gas is taken through cyclic process as shown in the figure. The net work done by the gas is:

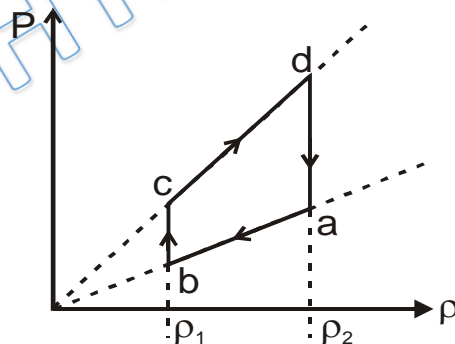


- (a) zero
- (b) PV
- (c) $2 PV$
- (d) $3 PV$

Q 12. One mole of an ideal gas at a temperature T_1 expands slowly according to the law $\frac{p}{v} = \text{constant}$. Its final temperature is T_2 . The work done by the gas is:

- (a) $R(T_2 - T_1)$
- (b) $2R(T_2 - T_1)$
- (c) $\frac{R}{2}(T_2 - T_1)$
- (d) $\frac{2R}{3}(T_2 - T_1)$

Q 13. An ideal gas undergoes a cyclic process abcda which is shown by pressure- density curve.



- (a) Work done by the gas in the process 'bc' is zero
- (b) Work done by the gas in the process 'cd' is negative
- (c) temperature of the gas at point 'a' is greater than at state 'c'
- (d) Net work done by the gas in the cycle is negative.



Answer Key

Q.1 c	Q.2 b	Q.3 d	Q.4 c	Q.5 a
Q.6 a	Q.7 a, b, d	Q.8 c	Q.9 c	Q.10 a
Q.11 b	Q.12 c	Q.13 a, b, d		

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