



Physical_Chemistry_2nd_YUGS_EV_ST



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1st SEM-2025_Bologna_Process
Mid_Exam_Class_A_Paper_A

Q1: Circle the right answer for all of the following

(50 Marks)

1: liquefaction of the gas means which of the following?

- (a) $Z = 1$
- (b) $Z > 1$
- (c) $Z < 1$
- (d) $Z \neq 1$

2: In the van der Waals equation, what is the correct formula for the volume of the gas?

- (a) n_i/n_T
- (b) V
- (c) V/m
- (d) V/n

3: If a gas has polar particles, then the difference between the volume of this gas is:

- (a) $V_{Real} > V_{Perfect}$
- (b) $V_{Real} < V_{Perfect}$
- (c) $V_{Real} = V_{Perfect}$
- (d) $V_{Real} \neq V_{Perfect}$

4: It can classify the type of reaction within adiabatic process as:

- (a) reversible
- (b) isobaric
- (c) isothermal
- (d) free expansion

5: If it is required to measure the work done in an isochoric process, the value of work will be:

- (a) zero
- (b) one
- (c) two
- (d) three

6: In a completely insulated system, the work done is in contact with which of the following?

- (a) gas
- (b) system
- (c) surrounding
- (d) pressure

7: When the internal pressure of the system is equal to atmospheric pressure, the actual value will be:

- (a) zero
- (b) one
- (c) two
- (d) three

8: During an isothermal reversible process, the change in temperature of the system is?

- (a) variable
- (b) equal to zero
- (c) 25°C
- (d) constant

9: Heat capacity is extensive property while molar heat capacity is ----- property:

- (a) proportional
- (b) intensive
- (c) extensive
- (d) direct

10: When $\Delta H = \text{zero}$, the process is:

- (a) isobaric
- (b) isochoric
- (c) isothermal
- (d) adiabatic

Q2: Using van der Waals equation, calculate the temperature of 5.0 mol of an unknown gas in a 5.0 L container at 80 bar. Compare this temperature with the value obtained from the ideal gas equation.

$a = 0.0341 \text{ L}^2 \text{ atm mol}^{-2}; b = 0.0237 \text{ L mol}^{-1}$

(25 Marks)

Q3: 1100 J of heat energy was applied to (50 g, 27 g mol^{-1}) of aluminum metal. The temperature increased from 25°C to 45°C . Calculate $C_{p,m}$ of aluminum.

(25 Marks)

Q2 | $PV = nRT$
 $(80) \cdot 5 = 5 \cdot 0.0821 T$
 $400 = 0.41 T$
 $T = 975$

$Q_2 = 10/25$

~~$P = \frac{nRT}{b} \cdot \frac{rV^2}{r2}$~~

~~$80 = \frac{5 \cdot 0.0821 T}{0.0234} \cdot \frac{0.34175}{25}$~~

~~$C = q \cdot \Delta T$
 $C = 100 \cdot 20$
 $C = 2200$~~

$\Delta T = T_2 - T_1$

~~$= 318 - 298$
 $= 20 K$~~ How?

$Q_3 = \frac{Zero}{25}$