Topic	Task	Date
Thermodynamics-1	Class Notes	Thursday, 9 November 2023
	O-I: 6, 10, 14, 20, 23, 24, 30, 31, 34, 36, 38, 42, 44, 46, 50, 52	Friday, 10 November 2023
	S-I: 1, 2, 12, 17, 20, 28, 31, 34, 38, 42	Saturday, 11 November 2023
		Sunday, 12 November 2023
Thermodynamics-2	Class Notes	Monday, 13 November 2023
	O-I: 1, 2, 5, 9, 11, 13, 17, 21, 24, 25, 26, 27, 28, 30, 32, 35, 39, 42, 43, 47, 48, 49, 50	Tuesday, 14 November 2023
Thermochemistry	Class Notes	Wednesday, 15 November 2023
	O-I: 2, 5, 8, 10, 14, 17, 18, 20, 2, 22, 23, 25, 26, 27, 28, 29, 32	Thursday, 16 November 2023
Thermodynamics & Thermochemistry	JEE MAIN Selected PYQs	Friday, 17 November 2023
Mole Concept	Class Notes	Saturday, 18 November 2023
		Sunday, 19 November 2023
	O-I : 3, 9, 12, 19, 21, 25, 34, 38, 40, 43, 45, 48, 51, 52, 53, 55, 58	Monday, 20 November 2023
Concentration Terms	Class Notes	Tuesday, 21 November 2023
	Live Class For Doubts	Wednesday, 22 November 2023
	O-I : 2, 6, 8, 11, 12, 14, 15, 17, 22, 25, 26, 28, 29, 31, 32, 34, 36 O-II : 17-24	Thursday, 23 November 2023
	JEE MAIN Selected PYQs	Friday, 24 November 2023
Chemical equilibrium	Class Notes	Saturday, 25 November 2023
		Sunday, 26 November 2023
	O-I: 3, 5, 10, 18, 21, 23, 27, 29, 30, 32, 35, 36, 38, 42, 44, 45, 46, 51, 55, 58, 59, 60, 62, 67, 69, 72, 74, 75, 76, 78	Monday, 27 November 2023

$$W = -Q$$

$$Q = nC\Delta T$$

$$= 1 \times 24 \times \Delta T$$

⑬

$$\Delta H_f \qquad \Delta S_f$$

$$\Delta G_r = \Delta H_r - T\Delta S_r$$

(14) $X \longrightarrow Y$

$$K = \frac{[Y]}{[X]}$$

$$\Delta G_{8}^{0} = 120 - \frac{3}{8}T$$

$$\Delta G = -RT \ln K$$

(24)

$$W = -P_{ext}(V_2 - V_1)$$

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

$$\boxed{Q = n C \Delta T}$$

$$\Delta U = Q + W$$

$$\Delta H = \Delta U + (P_2 V_2 - P_1 V_1)$$

(23) $$-72.3 = \underline{\underline{\Delta U}} + (-1) RT$$
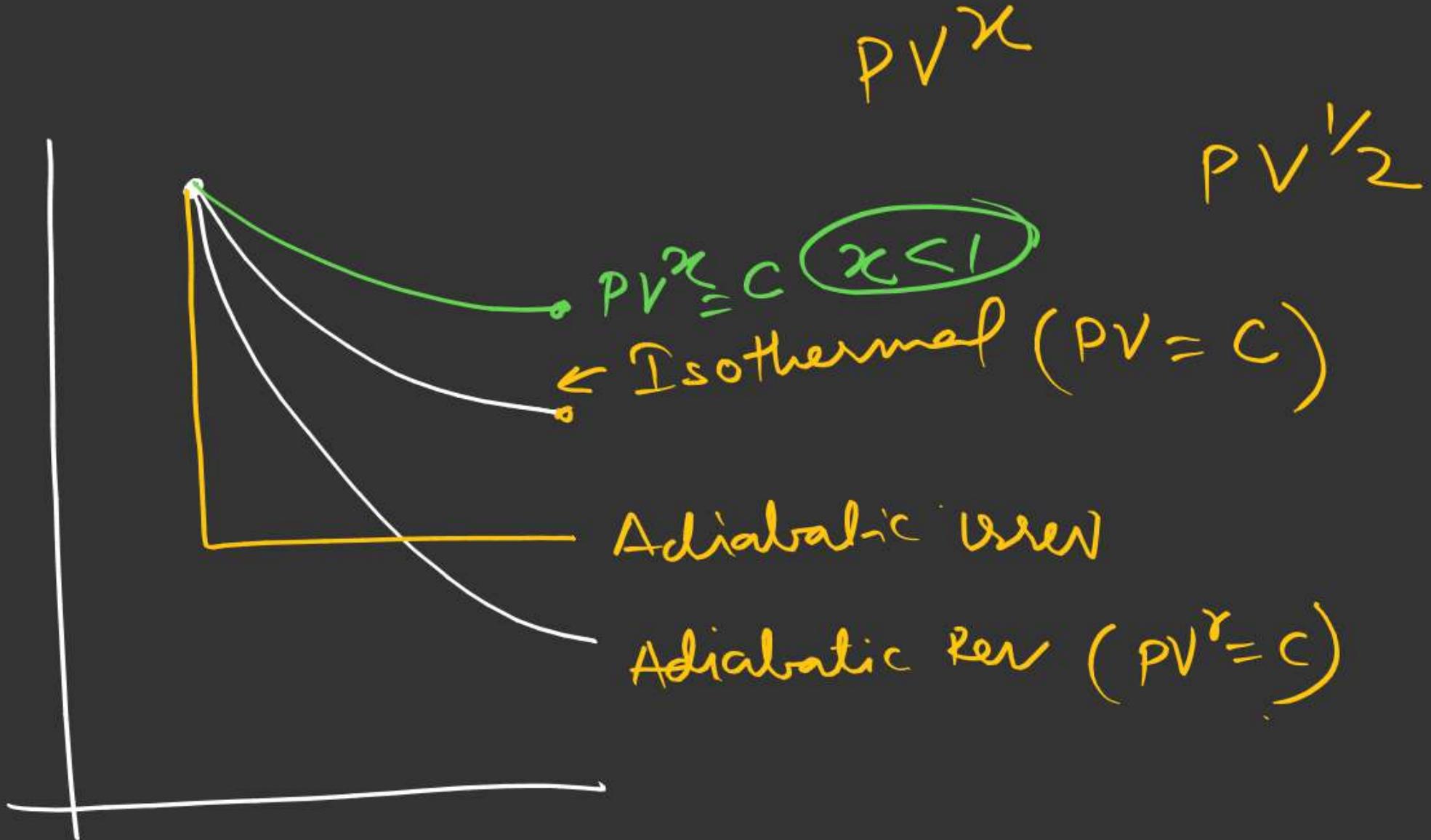
(31) $$W = -P_{ext}(V_2 - V_1)$$

(25) $$\frac{500}{18} \times 75.6 \times 20$$

$$= \left(\frac{n \times 9}{18} \times 6000 \right)$$

(46)

PV^x

$PV^{1/2}$

$PV^x = C$ (x < 1)

← Isothermal $(PV = C)$

Adiabatic Urrev

Adiabatic Rev $(PV^r = C)$

$S-\hat{1}$ (17) 2 mol H_2O

$$H_2O(\ell) \longrightarrow H_2O(g)$$

$$+40.66 = \Delta U + (1) RT$$

(38) $\boxed{PV^{-2} = Const}$

$$(1, 100K) , (2, ?)$$

$$C = C_V - \frac{R}{x-1}$$

(20)

$$2A + 3B \longrightarrow 4C$$
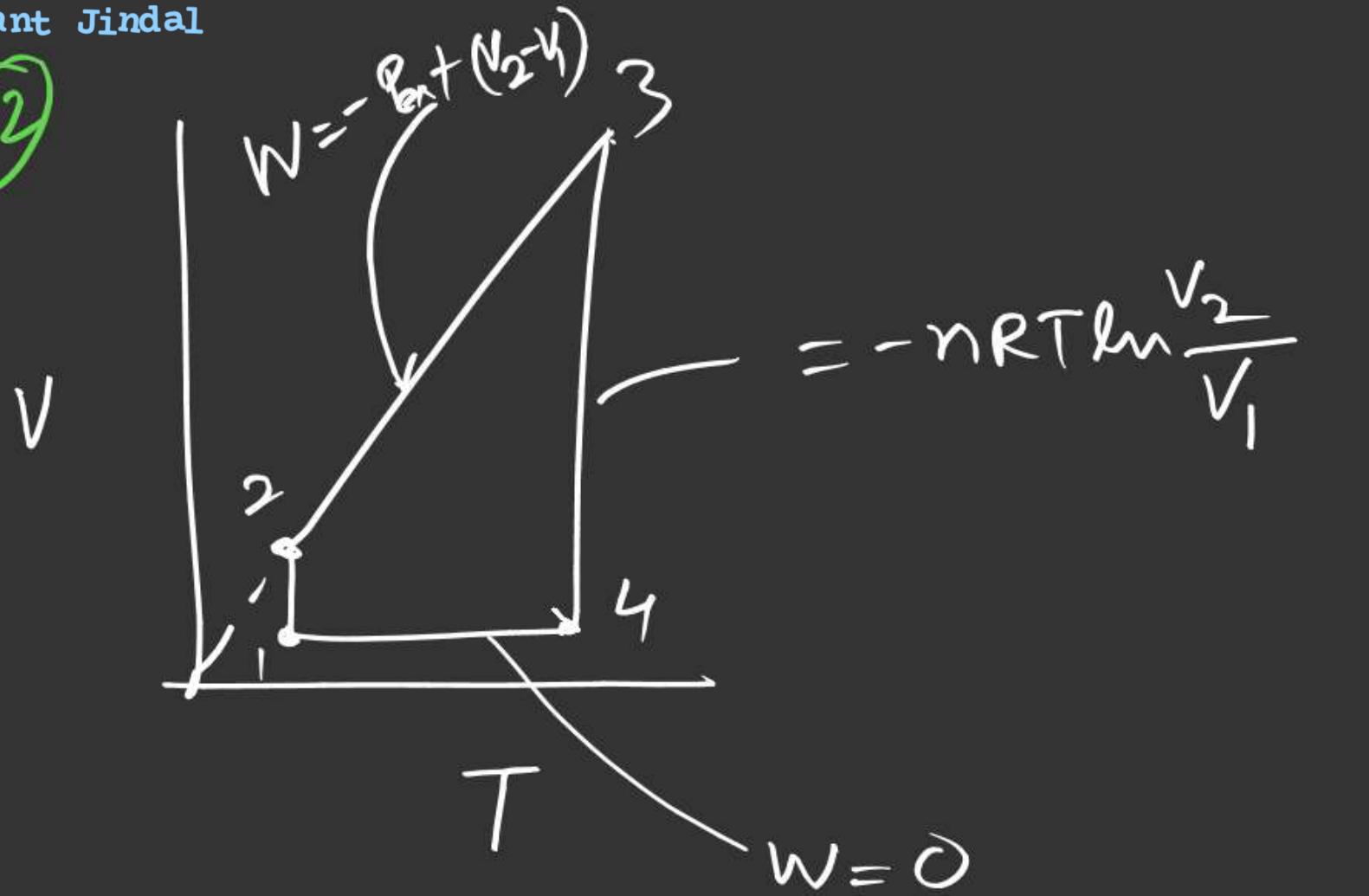
$$-20 = \Delta U + (-1) RT$$

$$2 \, mol \longrightarrow \Delta U$$

$$1 \longrightarrow \frac{\Delta U}{2}$$

$$0.4 \longrightarrow \boxed{\frac{\Delta U}{2} \times 0.4}$$

(52)

$W = -P_{ext}(V_2 - V_1)$

3

$= -nRT \ln \dfrac{V_2}{V_1}$

V

2

4

1

T

$W = 0$

TD-2   0-1

② $\eta = \dfrac{T_2 - T_1}{T_2} \times 100$

$= \underline{40\%}$

⑬ $\Delta H = 60 kJ/mol$

$\Delta S_{univ} = 0$

$\Delta S_{sys} = \dfrac{\Delta H}{T} = \dfrac{60 \times 10^3}{300}$

$= 200$

(24)

$$\Delta S_{273K} = \frac{\Delta H}{273} = \frac{-6000}{273} \qquad \text{at} \qquad 273 \text{ K}$$

$$\Delta S_{263} - \Delta S_{273} = (\Delta C_p)_r \, \ln \frac{263}{273} \qquad\qquad H_2O(\ell) \rightarrow H_2O(s)$$

$$\Delta U = 0$$

$$V = \text{const}$$

$$\Delta S = \boxed{n \, C_v \, \ln \frac{T_2}{T_1}} + n R \ln \frac{V_2}{V_1}$$

$$S \downarrow$$

$$\Delta H = 0$$

$$H = \text{const}$$

$$dG = V \, dp$$
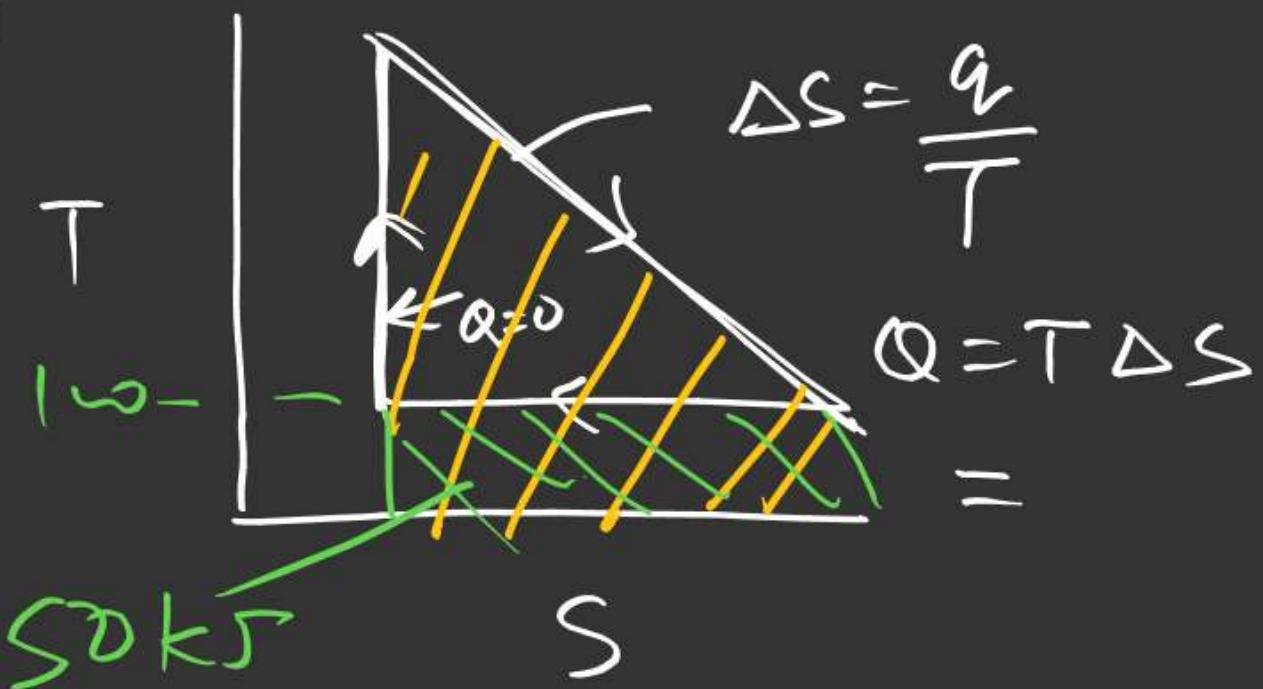
$$dG = n R T \ln \frac{P_2}{P_1}$$

(43)

$$\Delta G = \Delta H - T \Delta S.$$

$$\Delta G \times \frac{3.42}{342}$$

(50)

$$\Delta S = \frac{q}{T}$$

$$Q = T \Delta S$$

$$=$$

$Q = 0$

T

$100-$

$50 kJ$

S

$$\text{Area} = \frac{1}{2} \times 100 \times \overset{250}{\cancel{500}}$$

$$|W| = \underline{25\, kJ}$$

$$Q_{supplied} = 50 + 25 = 75$$

(10)

$$H_2 \longrightarrow 2H \qquad \Delta H = 436$$

$$H_2 + \frac{1}{2}O_2 \longrightarrow H_2O \qquad \Delta H = -242$$

$$2H + \frac{1}{2}O_2 \longrightarrow H_2O \qquad \Delta H = ?$$

(14)

$$2NO_2 \longrightarrow N_2O_4$$
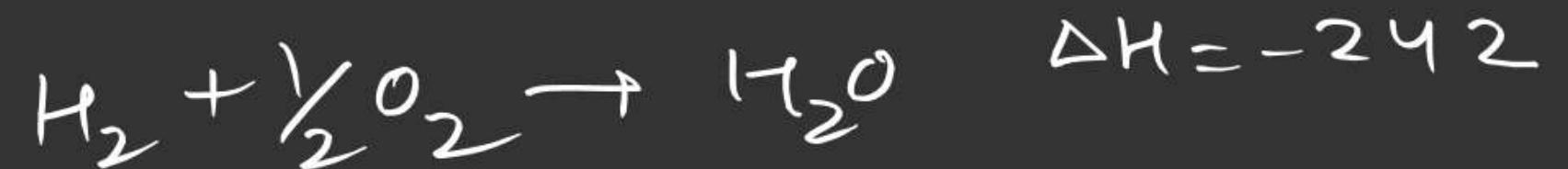
$$\Delta U_r = \Delta U_f (N_2O_4) - 2 \times \Delta U_f (NO_2)$$

$$-16 = 2 - 2 \times \Delta U_f (NO_2)$$

$$\longrightarrow \Delta U_f (NO_2) = 9$$

$$\tfrac{1}{2}N_2 + O_2 \longrightarrow NO_2(g)$$

$$\Delta H_f = \Delta U_f + (-\tfrac{1}{2})RT$$

(18)

$$H_2 + \tfrac{1}{2}O_2 \longrightarrow H_2O(\ell)$$

$$= x_1 + \frac{x_2}{2} - 2x_3 - x_4$$

$$-2.5 \text{ kJ/mol} \times 2$$

500 ml

4M

2 mol

(23)

$$C_2H_4 + H_2 \xrightarrow{-132} C_2H_6$$

$$\Delta H_\gamma = 115 - (-140) = 255$$

$$C_4H_6 + 2H_2 \xrightarrow{\quad} C_4H_{10}$$

(X)

0

$$-2 \times 132$$

$$CH_2 = CH - CH = CH_2 + 2H_2$$

(28) $\Delta H_f \left[H^+(aq) \right] = 0$

$$H^+ + \underline{OH^-} \longrightarrow H_2O \qquad \Delta H_r = -57.3 \ kJ/mol$$

$$\boxed{\Delta H_f = -285.5}$$
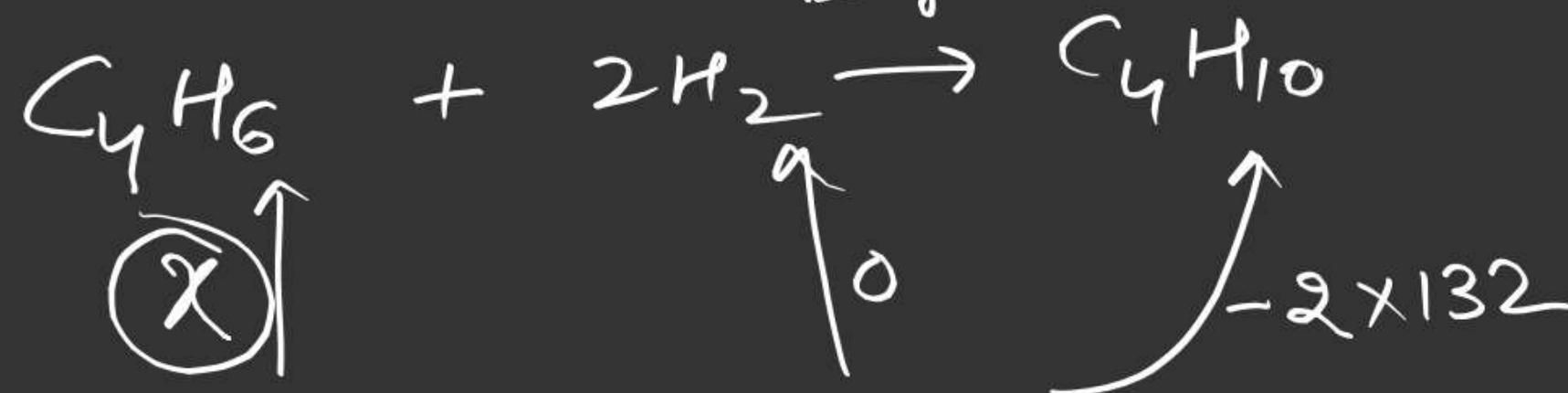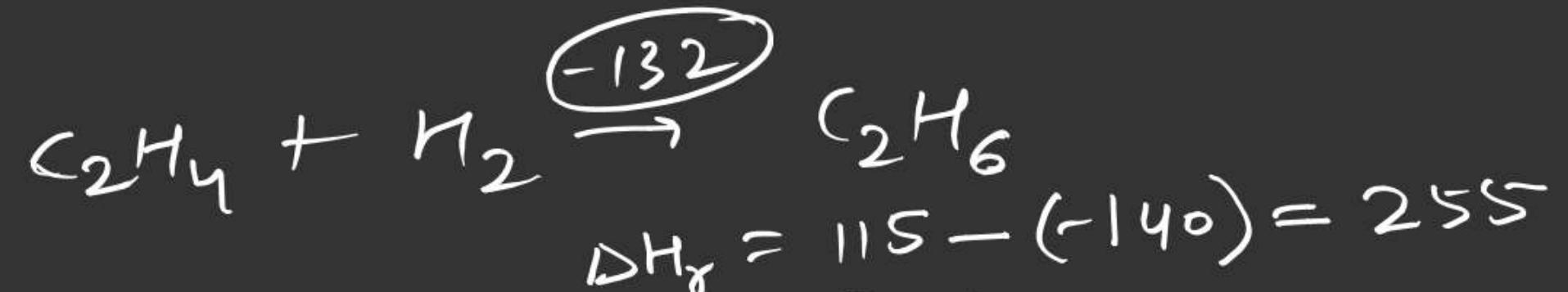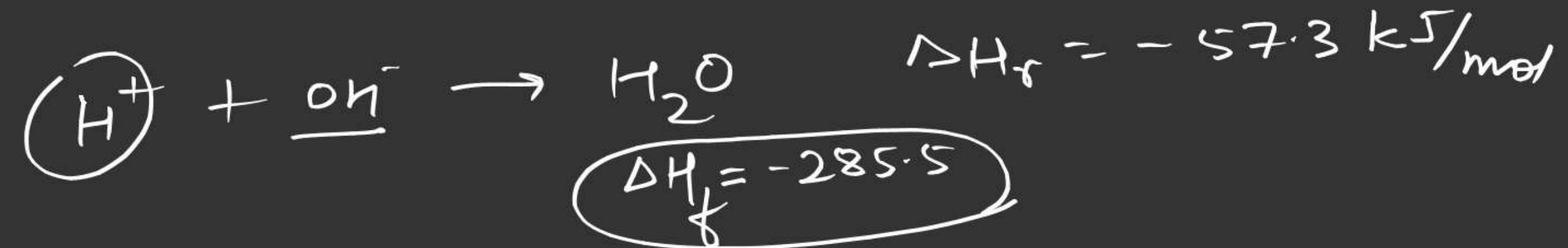
$$\Delta H_r = -57.3 = -285.5 - \Delta H_f (OH^-)$$

| Topic	Content	Date
Ionic equilibrium	Class Notes	Tuesday, 28 November 2023
	Live Class For Doubts	Wednesday, 29 November 2023
	O-I: 1, 3, 7, 10, 12, 14, 16, 17, 18, 20, 21, 23, 26, 27, 28, 32, 35, 37, 38, 42, 44, 49, 52, 54, 55, 58, 60, 61, 45, 66, 68, 70, 72, 75, 77, 78, 79, 50, 84, 85, 86, 90, 93, 94, 96, 98	Thursday, 30 November 2023
		Friday, 1 December 2023
Equilibrium	JEE MAIN Selected PYQs	Saturday, 2 December 2023
Redox		Sunday, 3 December 2023
	Class Notes	Monday, 4 December 2023
	O-I: 5, 6, 7, 8, 9, 10, 18, 19, 20, 21, 29, 30, 31, 32, 35, 37, 39, 40, 43, 45, 46, 48, 50, 52, 55, 57	Tuesday, 5 December 2023
	Live Class For Doubts	Wednesday, 6 December 2023
Electrochemistry	Class Notes	Thursday, 7 December 2023
	O-I: 2, 3, 8, 10, 13, 16, 17, 18, 21, 25, 26, 32, 32, 35, 36, 40, 43, 45, 47, 49, 51, 54, 56, 60, 62, 64, 65, 67, 70, 72, 73, 74, 75 77, 78, 79, 82, 84, 87, 88, 89	Friday, 8 December 2023
	JEE MAIN Selected PYQs	Saturday, 9 December 2023
		Sunday, 10 December 2023
Kinetics	Class Notes	Monday, 11 December 2023
	O-I: 3, 4, 6, 8, 9, 14, 15, 20, 23, 25, 28, 29, 31, 32, 33, 38, 40, 43, 45, 48, 50, 52, 54, 56, 57, 56, 61, 64, 65, 68, 70, 71	Tuesday, 12 December 2023
	Live Class For Doubts	Wednesday, 13 December 2023
	JEE MAIN Selected PYQs	Thursday, 14 December 2023
liquid solution	Class Notes	Friday, 15 December 2023
	O-I:2, 3, 5, 7, 15, 18, 19, 21, 22, 24, 26, 29, 32, 33, 37, 40, 44, 46, 49, 51, 53, 57, 58, 64, 66, 67, 68, 71, 73, 75, 77, 79	Saturday, 16 December 2023
		Sunday, 17 December 2023
	JEE MAIN Selected PYQs	Monday, 18 December 2023
Atomic Structure	Class Notes	Tuesday, 19 December 2023
	Live Class For Doubts	Wednesday, 20 December 2023
	O-I: 2, 4, 7, 9, 11, 14, 15, 18, 19, 25, 27, 28, 31, 33, 34, 37, 40, 42, 46, 47, 50, 51, 54, 58, 60, 61, 63, 64, 66, 67	Thursday, 21 December 2023
	JEE MAIN Selected PYQs	Friday, 22 December 2023

(Physical Chemistry)   Assignment (Class 12th)
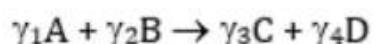
1. NO_2 required for a reaction is produced by the decomposition of N_2O_5 in CCl_4 as per the equation, $2\ N_2O_5(g) \rightarrow 4\ NO_2(g) + O_2(g)$

   The initial concentration of N_2O_5 is 3.00 mol L^{-1} and it is 2.75 mol L^{-1} after 30 minutes. The rate of formation of NO_2 is:

   (A) 1.667×10^{-2} mol L^{-1} min^{-1} (B) 2.083×10^{-3} mol L^{-1} min^{-1}

   (C) 4.167×10^{-3} mol L^{-1} min^{-1} (D) 8.333×10^{-3} mol L^{-1} min^{-1}

   [Jee Main, April 2019]

2. For a given chemical reaction

   $\gamma_1 A + \gamma_2 B \rightarrow \gamma_3 C + \gamma_4 D$

   Concentration of C changes from 10 mmol dm^{-3} to 20 mmol dm^{-3} in 10 seconds. Rate of appearance of D is 1.5 times the rate of disappearance of B which is twice the rate of disappearance A. The rate of appearance of D has been experimentally determined to be 9 mmol dm^{-3} s^{-1}. Therefore, the rate of reaction is _____ mmol dm^{-3} s^{-1}. (Nearest Integer)

   [JEE Main, June 2022]

3. For a first order reaction, the time required for completion of 90% reaction is 'x' times the half life of the reaction. The value of 'x' is

   (Given: ln 10 = 2.303 and log 2 = 0.3010)

   (A) 1.12   (B) 2.43   (C) 3.32   (D) 33.31

   [JEE Main, June 2022]