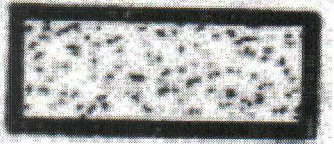
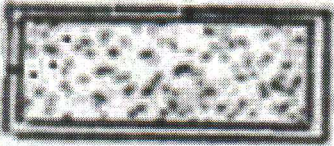
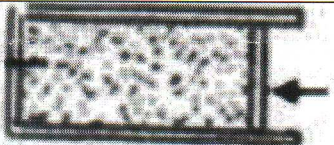
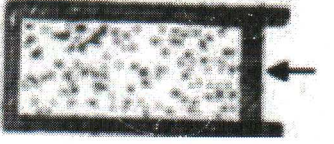
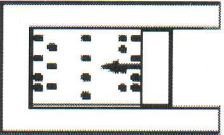
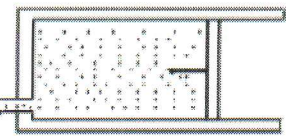


Corrigé type

Questions de cours1 (8.75pts)

9,1

1,25pts

	Système	Caractéristiques (isolé I, fermé F, ouvert O)	Transfert (masse M, chaleur C, travail T)
Σ_1		- Isolé <input checked="" type="checkbox"/> - F <input checked="" type="checkbox"/> - O <input checked="" type="checkbox"/>	- M <input checked="" type="checkbox"/> - T° <input checked="" type="checkbox"/> - W <input checked="" type="checkbox"/>
Σ_2	V=cte 	- I <input checked="" type="checkbox"/> - Fermé <input checked="" type="checkbox"/> - O <input checked="" type="checkbox"/>	- M <input checked="" type="checkbox"/> - T° <input checked="" type="checkbox"/> - W <input checked="" type="checkbox"/>
Σ_3	 T = cte	- I <input checked="" type="checkbox"/> - Fermé <input checked="" type="checkbox"/> - O <input checked="" type="checkbox"/>	- M <input checked="" type="checkbox"/> - T° <input checked="" type="checkbox"/> - W <input checked="" type="checkbox"/>
Σ_4	 P=cte	- I <input checked="" type="checkbox"/> - Fermé <input checked="" type="checkbox"/> - O <input checked="" type="checkbox"/>	- M <input checked="" type="checkbox"/> - T° <input checked="" type="checkbox"/> - W <input checked="" type="checkbox"/>
Σ_5	 P=cte	- I <input checked="" type="checkbox"/> - Fermé <input checked="" type="checkbox"/> - O <input checked="" type="checkbox"/>	- M <input checked="" type="checkbox"/> - T° <input checked="" type="checkbox"/> - W <input checked="" type="checkbox"/>
Σ_6	 T = cte	- I <input checked="" type="checkbox"/> - F <input checked="" type="checkbox"/> - Ouvert <input checked="" type="checkbox"/>	- M <input checked="" type="checkbox"/> - T° <input checked="" type="checkbox"/> - W <input checked="" type="checkbox"/>

Transformation A :

$$\boxed{V_2 = \frac{V_1}{a}}$$

0,25

$$PV^\gamma = \text{Cst} \Rightarrow P_2 V_2^\gamma = P_1 V_1^\gamma \Rightarrow \frac{P_2}{P_1} = \left(\frac{V_1}{V_2} \right)^\gamma = a^\gamma \Rightarrow \boxed{P_2 = P_1 a^\gamma}$$

0,25

$$T_2 = \frac{P_2 V_2}{R} = \frac{P_1 V_1}{R} a^{\gamma-1} = T_1 a^{\gamma-1} \Rightarrow \boxed{T_2 = T_1 a^{\gamma-1}}$$

0,25

Transformation B :

$$\boxed{P_3 = P_2 = a^\gamma P_1}$$

0,25

$$\boxed{V_3 = \frac{V_4}{b} = \frac{V_1}{b}}$$

0,25

$$T_3 = \frac{P_3 V_3}{R} = \frac{a^\gamma}{b} T_1 \Rightarrow \boxed{T_3 = \frac{a^\gamma}{b} T_1}$$

0,25

Transformation C :

$$V_4 = V_1 \quad P_4 V_4^\gamma = P_3 V_3^\gamma \Rightarrow P_4 = P_3 \left(\frac{V_3}{V_4} \right)^\gamma = a^\gamma P_1 \left(\frac{V_1}{b V_1} \right)^\gamma$$

$$T_4 = \frac{P_4 V_4}{R} = \left(\frac{a}{b} \right)^\gamma T_1$$

0,25

$$\boxed{T_4 = T_1 \left(\frac{a}{b} \right)^\gamma}$$

0,25

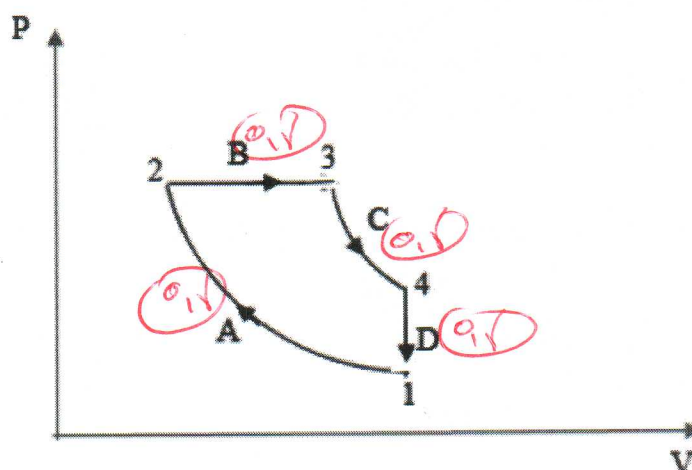
Questions de cours2 : (3pts) **Cocher la repense exacte**

Grandeur	extensive	intensive	Fonction d'état
Volume	+ <u>0,7</u>		
température		+ <u>0,7</u>	
pression		+ <u>0,7</u>	
travail	+ <u>0,7</u>		

Exercice 1 (8,25pts)

Corrige

2 1- Le cycle sur le diagramme de Clapeyron



2) - 4,15 Pts

$$V_1 = \frac{RT_1}{P_1} = \frac{8.314 \times 300}{1 \times 10^5} = 24.94 \times 10^{-3} \text{ m}^3 = 24.94 \text{ l} \quad (0.27)$$

$$\begin{array}{lll} V_2 = 2.77 \text{ l} & V_3 = 8.31 \text{ l} & V_4 = 24.94 \text{ l} \\ P_2 = 21.67 \text{ bar} & P_3 = 21.67 \text{ bar} & P_4 = 4.656 \text{ bar} \\ T_2 = 722.5 \text{ K} & T_3 = 2167 \text{ K} & T_4 = 1397 \text{ K} \end{array}$$

2 pts

2 pts

3/

Transformation A

$$(0.17) \quad Q_A = 0 \quad W_A = U_2 - U_1 = C_V (T_2 - T_1) = \frac{R}{\gamma - 1} (a^{\gamma-1} - 1) T_1 = 8.78 \text{ KJ}$$

Transformation B

$$(0.17) \quad W_A = -P_2 (V_3 - V_2) = -12 \text{ KJ}$$

6

(0.17)

$$Q_B = C_P (T_3 - T_2) = \frac{\gamma}{\gamma - 1} R (T_3 - T_2) = 42.05 \text{ KJ}$$

Transformation C

$$W_C = (U_4 - U_3) = C_V (T_4 - T_3) = \frac{R}{\gamma - 1} (T_4 - T_3) = -16.02 \text{ KJ}$$

(0.17)

$$Q_C = 0$$