T	P kPa	v m3/kg	Phase
٢٨	3.816	0.0010035	Stat Liq
٢٥	٥	0.001003	Comp liq
269.35	٥.	٢	Stat mix

① Table (A-4) @ T=28

T	P
25	3.1698
28	P
30	4.2469

$$P = 3.1698 + \frac{4.2469 - 3.1698}{30 - 25}(28 - 25)$$

$$= 3.81606 \text{ kPa}$$

T	V
25	0.001003
28	V
30	0.001004

V = 0.0010035

T = 25 P = 5

(A-4) $P_{sat} = 3.1698 < P$

(A-7) $P < 5$ MPa

(A-4) $V = V_f = 0.001003$

= Comp liquid

T	V
250	4.8206
T	5
300	5.1284

$$T = 250 + \frac{300 - 250}{5.2841 - 4.8206}$$

= 269.35 (Sat Mix)

Q1 (5.0 MARKS)

Write ✔ for the right answer and ✗ for the wrong answer

1. For closed system *(Control mass)* energy can cross its boundary ..... ○
2. For open system the mass can cross its boundaries ..... ○
3. The first law of thermodynamics is the conservation of mass principle ..... ○
4. The first law of thermodynamics is the conservation of energy principle ..... ○
5. Phase changes occur at constant volume ..... ○

Q2-

The pressure gage on a 2.5-m^3 rigid oxygen tank reads 500 kPa at $T_1 = 28°C$. Determine the final absolute pressure if the oxygen is heated to $T_2 = 35°C$. The atmospheric pressure is 97 kPa and the gas constant of oxygen is $R=0.2598$ kPa.m^3/kg.K.