

國立臺北科技大學

九十六學年度化學工程研究所碩士在職專班入學考試

乙組：物理化學試題

填准考證號碼

第一頁 共一頁

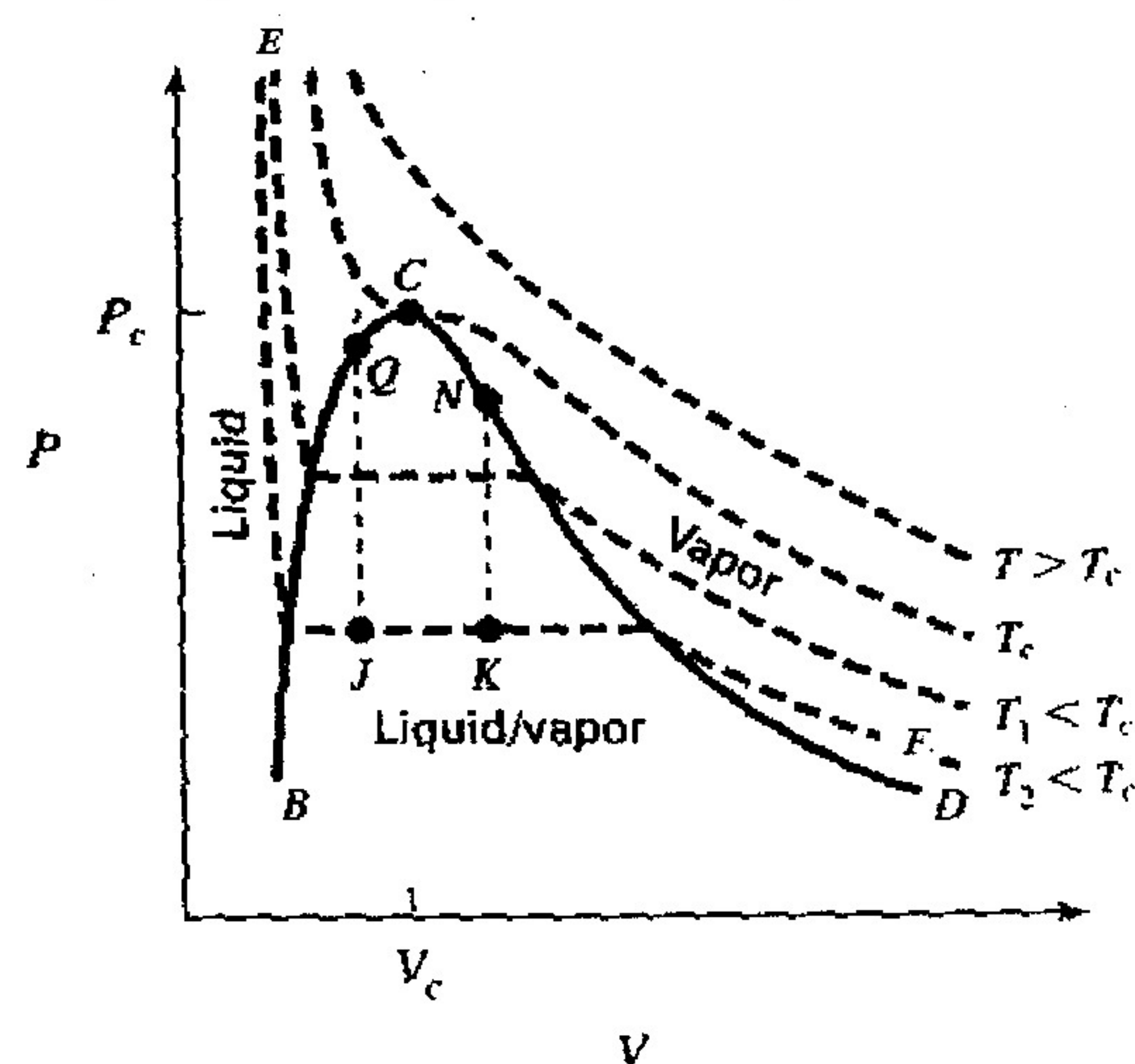
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注意事項：

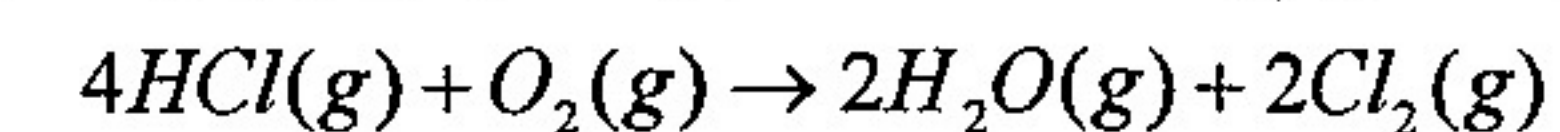
1. 本試題共【5】題，配分共100分。
2. 請按順序標明題號作答，不必抄題。
3. 全部答案均須答在試卷答案欄內，否則不予計分。
4. 計算題答案，須詳述計算過程，否則不予計分。

1. (20%) How many degrees of freedom, C , E , F and J points, as shown in the following PV diagram of pure water system, in which T_c is the critical temperature?

C : _____
 E : _____
 F : _____
 J : _____



2. (20%) Calculate the standard heat (J) at 25°C for the following reaction:



Standard heats of formation at 298.15 K are:



3. (20%) Calculate the activation energy (kJ/mol) for a chemical reaction, of which the reaction rate constant is 0.0004 s^{-1} at 40°C, and 0.007 s^{-1} at 60°C.

($R=8.314\text{ J/mol}\cdot\text{K}$)

4. (20%) A chemical reaction carried out in a constant-volume batch reactor, $2A \rightarrow B$, is second order, then

$$\frac{dC_A}{dt} = -kC_A^2$$

If the initial concentration of A, C_{A0} , is 1 M, and C_A is 0.1 M after 1200 seconds, please estimate the reaction rate constant k ($1/\text{M}\cdot\text{s}$).

5. (20%) Calculate the atomic packing factor (APF) of a body-centered cubic (BCC) crystal structure.

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