共五題，滿分 100 分。

1.　(25 %) Please explain the following terms:

　　(a) thermal conductivity

　　(b) phase diagram

　　(c) degradation

　　(d) copolymer

　　(e) dielectric constant

2.　(20 %) What are the characteristics of rubbers, thermoplastics, and thermosets? Please give one example, respectively.

3.　(20 %) Please give at least five differences of properties between metals, ceramics, and polymers? How do you experimentally detect these differences?

4.　(15%) What is melting temperature? Please discuss the factors that affect the melting temperature of polymers.

5.　(20%) For a compound CsCl, the crystal system is cubic, and the positions of Cs^+ and Cl^- are (0, 0, 0) and (1/2, 1/2, 1/2), respectively.

　　(a).　Please identify the indices of the first four reflection planes for the X-ray diffraction profiles of CsCl.

　　(b).　Please calculate the value of a, which is the side length of the cubic crystal system, if the corresponding 2θ values for the first four peaks are given as follows:

Peak #	2θ (˚)
1	21.69
2	30.76
3	37.98
4	44.01

　　(λ = 1.542 Å)

試題隨卷繳回