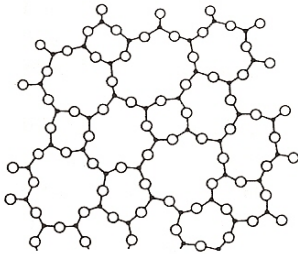


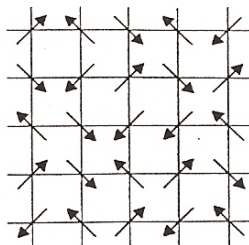
“Amorphous Materials”

Class # _____ Name _____

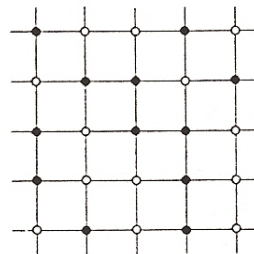
1. Explain clearly for four types of disorder in imperfect crystals by considering following figures.



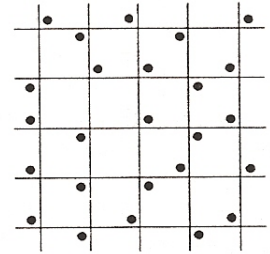
(a)



(b)



(c)



(d)

2. What are the 4 major contributors for substitutional solid-solution formation?

3. () are () solids that exhibit rotational symmetries incompatible with conventional periodic lattice order, for example, () symmetry in three dimensions and () symmetry in the plane. The first example was obtained as a metastable icosahedral configuration in rapidly solidified (). Soon after this discovery, thermodynamically () quasicrystals were found in several other alloys. At present both metastable and stable quasicrystalline phase can be formed in a variety of metallic alloys. And certain stable phases can be grown into a () several millimeters or even centimeters in size. It would appear obvious, therefore, that quasicrystals can represent a free-energy minimum state at a given temperature. Such highly perfect quasicrystalline materials exhibit a striking diffraction pattern; namely, (i) a large number of () peaks, (ii) peak () comparable to that from nearly perfect crystals such as silicon, and (iii) all peaks are located at their ideal positions, consistent with the quasicrystalline symmetry within the limits of instrumental resolution.

Al-Mn alloy/ aperiodic/ single grain/ sharpness/ Quasicrystals/ icosahedral/ tenfold/ diffraction/ stable

* Suggestion for class or request for personal conversation: