Answer the following questions.

Question 1
(20 marks)

a) Compare Bragg's equation with those of laue and show that they are equivalent.

b) X-rays are incident from (111) planes of a single cube crystal with a lattice parameter of 0.2nm. The first order maximum is observed in the direction of 87° to the incident ray. Calculate the Bragg angle and the wavelength of the x-rays.

Question 2
(20 marks)

Calculate the atomic packing factor (APF) for: i) Simple cubic lattice, ii) Body centered cubic lattice and iii) Face centered cubic lattice.

Question 3
(30 marks)

Write short notes on the three techniques of preparation of non-crystalline materials with referring to the advantages and disadvantages of each one.

Question 4
(15 marks)

What is the meaning of coordination number and describe how this number referring to the physical properties of chalcogenide glasses.

Question 5
(15 marks)

Explain briefly the glass transition and the factors that determine the glass-transition temperature?

With my Best Wishes