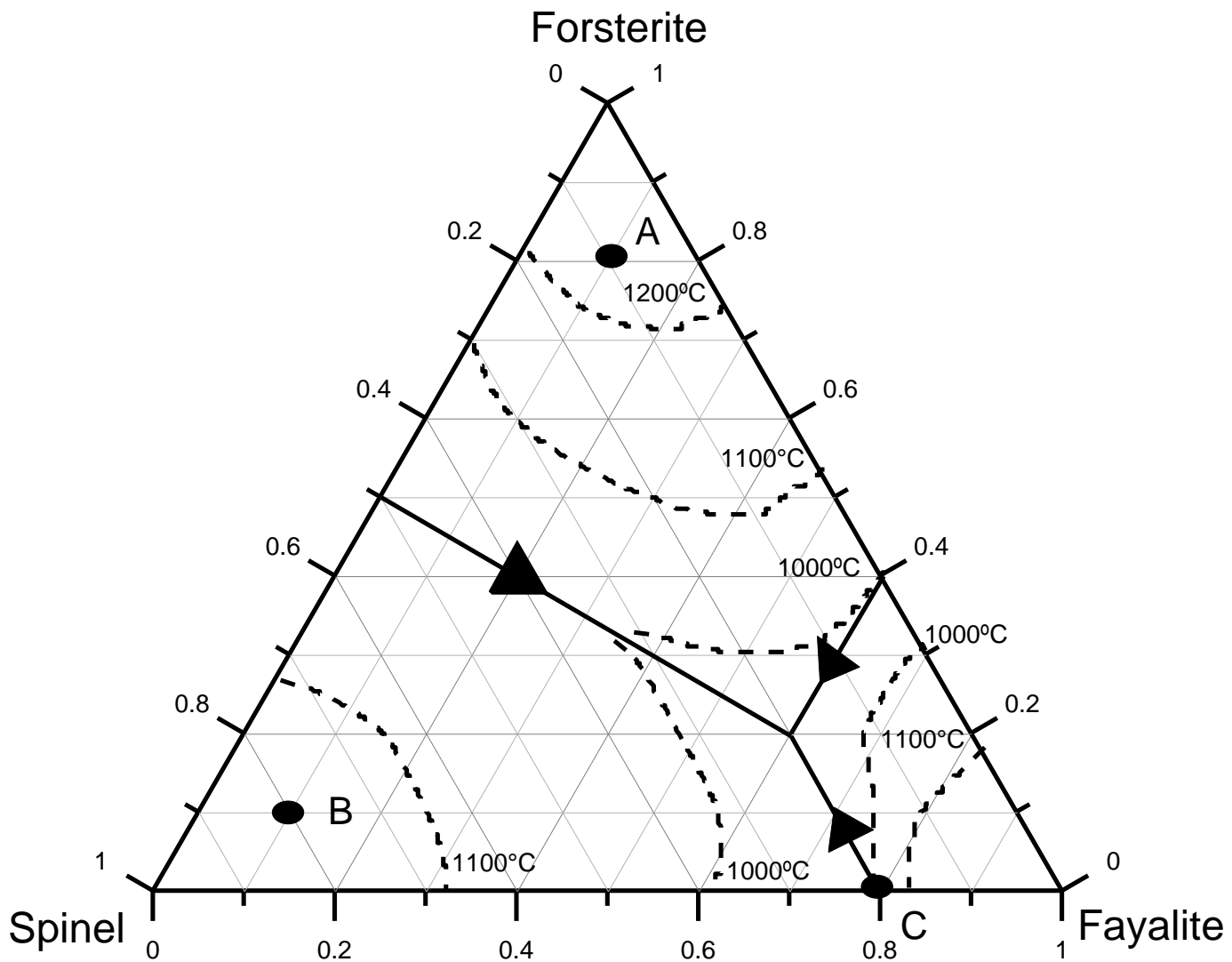


UNIVERSITY OF PRETORIA

IGNEOUS PETROLOGY GLY 261 PRAC TEST 1

This exam consists of questions totalling 30 marks, and lasts for 45 minutes.



The following questions apply to the phase diagram above.

1. Consider the system Spinel-Forsterite.
 - a. Draw a binary phase diagram for this system **5 marks**
 - b. What is the maximum liquidus temperature for this system? **1 mark**
2. Consider the Spinel-Forsterite-Fayalite phase diagram?
 - a. Which melt (A, B, or C) will crystallise last if all melts start cooling at 1250 degrees C? **1 mark**
 - b. What temperature is the solidus in the system? **1 mark**
3. Consider melt composition A
 - a. What will the melt composition be after 40% of the system has crystallised? **3 marks**
 - b. What will the crystal composition be after 40% of the system has crystallised? **2 marks**
 - c. What will be the total composition of the system at this point? **1 mark**
 - d. What will the composition of the crystals in the system just before the liquid reaches the eutectic composition? **3 marks**
4. Consider liquid B.
 - a. How much liquid is left in the system when the cotectic is reached? **3 marks**
 - b. What proportions of which crystals crystallise from the melt while it travels along the cotectic? **2 marks**
 - c. How much of melt A must be added to melt B to create a hybrid melt that will crystallise on the cotectic only? **3 marks**
5. Consider liquid C.
 - a. What minerals will crystallise first as this liquid cools? **1 mark**
 - b. At what temperature will this composition become completely solid? **2 marks**
 - c. What will be the mineral composition of the system at that point? **2 marks**