

Final test sample questions and format.

NOTE: THESE EXAMPLES ARE PROVIDED TO ILLUSTRATE THE FORMAT OF THE FINAL TEST. THEY ARE NOT INTENDED TO COMPLETELY COVER THE MATERIAL. ACTUAL QUESTIONS IN THE FINAL TEST WILL COVER OTHER TOPICS FROM THE COURSE.

Answer question 1 and three other questions. If you answer more than the required number of questions, clearly delete the questions you do not wish to have marked.

The sample for question 1(a) will be passed around the class during the exam. It will be available for ten minutes only. (Write your answer at the back of your answer booklet to avoid breaking the flow of your other questions.)

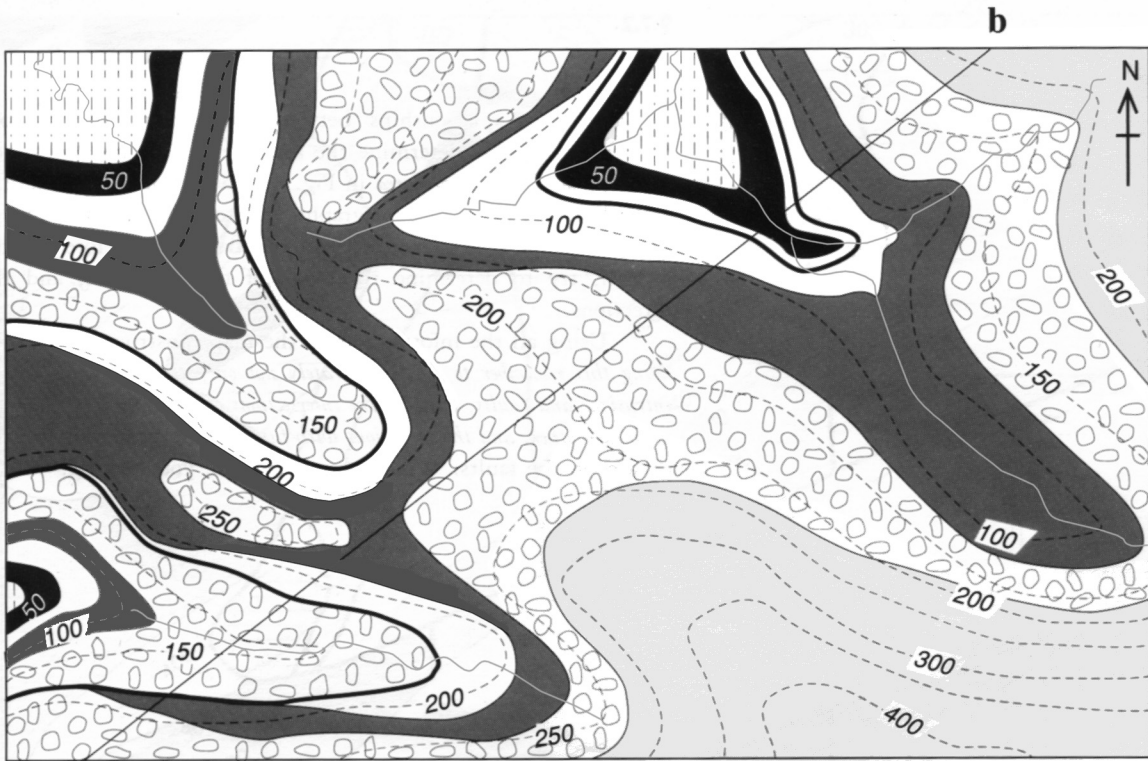
Question 1 is worth 40% of the total mark. The other questions are worth 20% each

1. Answer both parts of this question. Answer question 1(a) as soon as the sample arrives at your desk.
 - (a) Describe the fabric(s) shown by sample A and explain how the fabric(s) formed.
 - (b) Construct a cross-section along the line **ab** on the map provided, so as to show the geologic structure. Make a list of the events in the geologic history of the area, for which the map provides evidence, starting with the earliest.

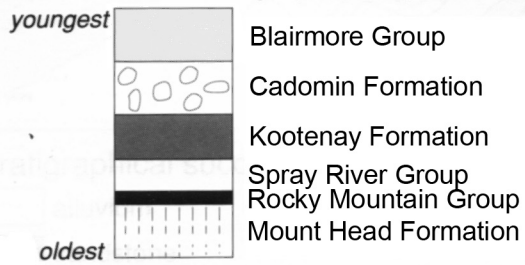
Questions 2 - 6. Choose 3 questions. Each question is worth 20% of the total mark. If you start more than 3 questions from this section, be sure to delete the answers that you do not want to be marked.

2. Explain what is meant by **strain axes**. A geologist working in deformed rocks measures the orientation of strain axis X as trend 123 plunge 45, and notes that the second strain axis Y is horizontal. Using a stereographic projection, determine the trend and plunge of strain axes Y and Z. If the rocks in the area are cleaved as a result of strain, what would you expect to be the strike and dip of the cleavage plane?
3. Draw a diagram to show what is meant by the **hinge line** and **axial surface** (or hinge surface) of a fold. Beds in an area of folded rocks are folded in a cylindrical fold whose hinge has trend 066 and plunge 22. The axial surface strikes east-west. Draw an equal-area projection showing the orientation of the hinge and axial surface. On your projection, sketch a simple possible pattern of density contours that would likely result if a geologist made multiple measurements of bedding orientation around the fold, and contoured the resulting distribution.
4. What are **superimposed folds**? The diagram shows structures in an outcrop of metamorphic rocks. Draw the axial traces of the various folds, label them with appropriate symbols (F1, F2 etc.), and also label the fabrics with corresponding symbols.
5. Explain what is meant by a **piercing point** on a fault and why piercing points are important for the calculation of fault slip. The map shows contours on a fault surface that dips at 45° towards the SE, together with piercing points in the hanging wall and the footwall. Determine the net slip of the fault (distance, trend and plunge), and calculate the dip slip and the strike slip.
6. What is a **shear zone**? The diagram shows several structures that are visible in a horizontal, smooth outcrop of a shear zone. Identify the structures by name and say whether the shear zone is sinistral or dextral.

Map for question 1



a Succession in order of age (ie., stratigraphic succession):



fault

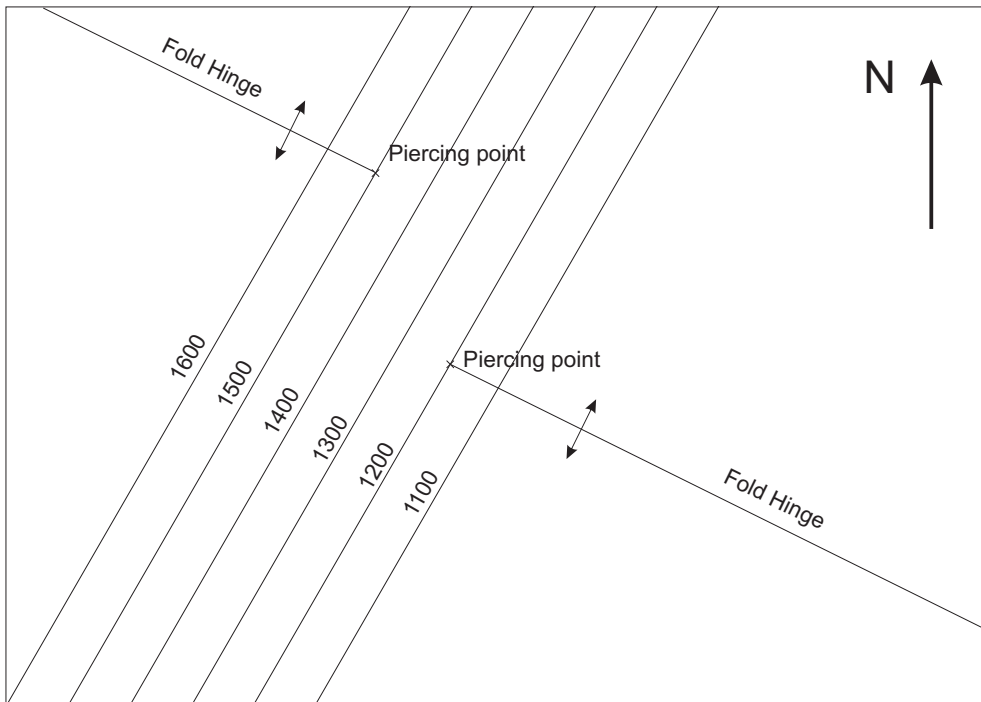
100m

b

Diagram for question 4



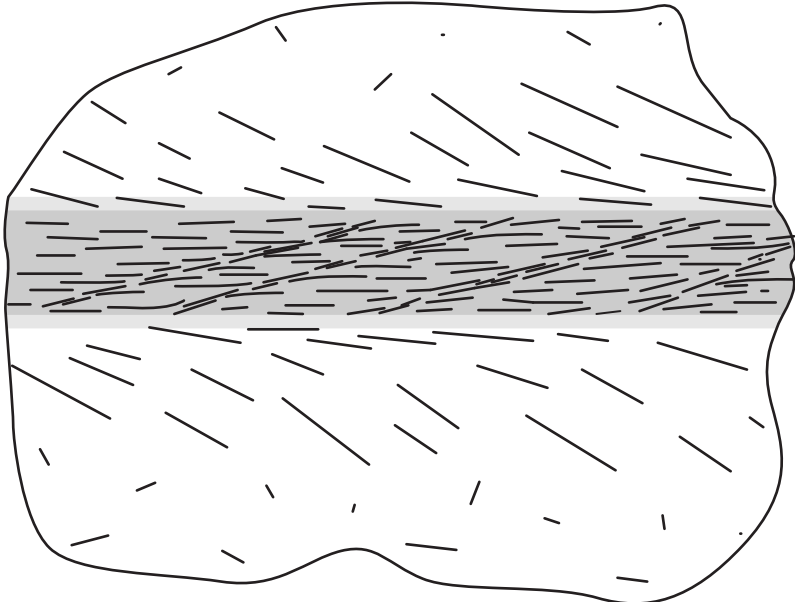
Map for question 5



Scale 1:10000

Contours show elevations of fault in metres above sea-level

Diagram for question 6



10 cm

Mylonite
Trace of foliation