Sample Map Problems

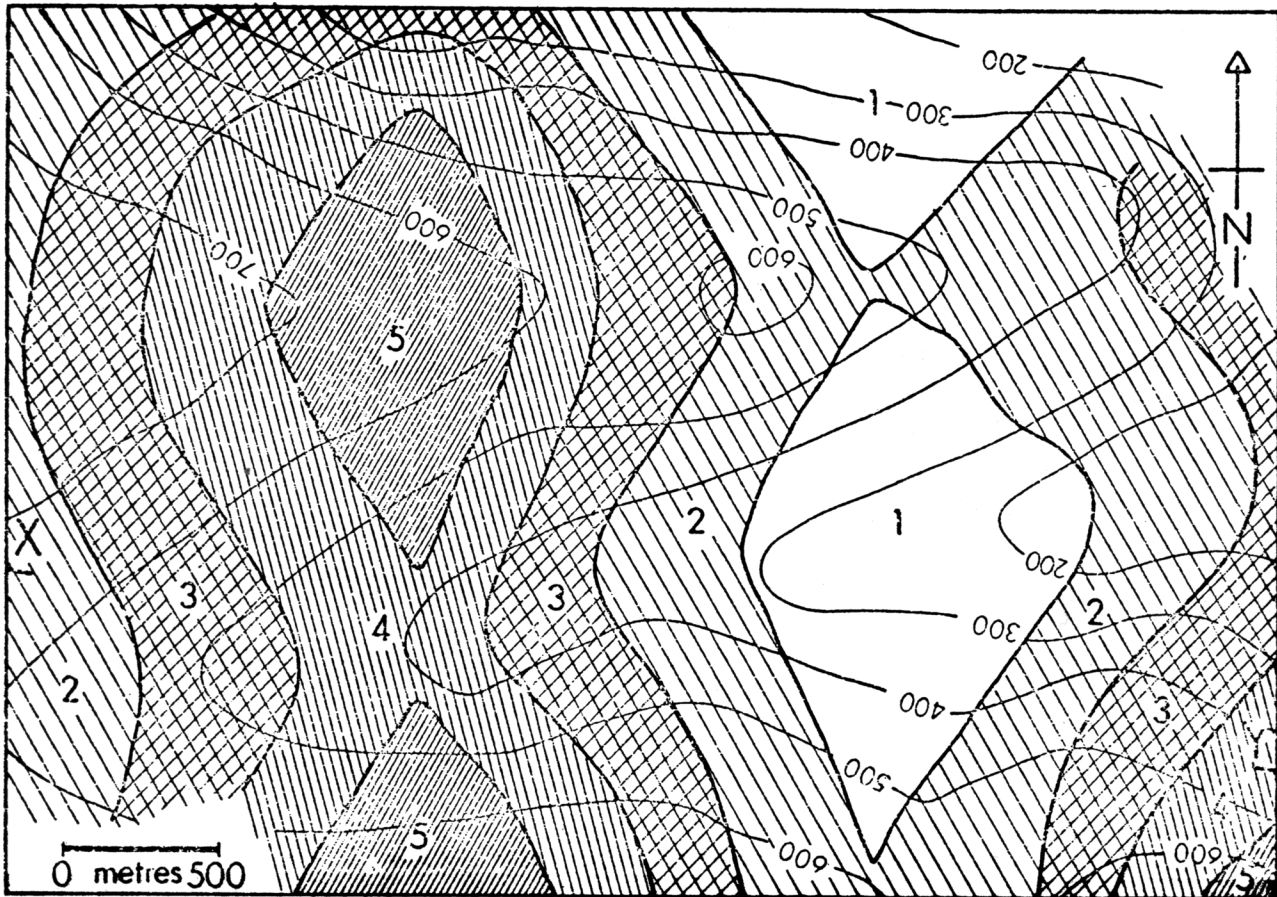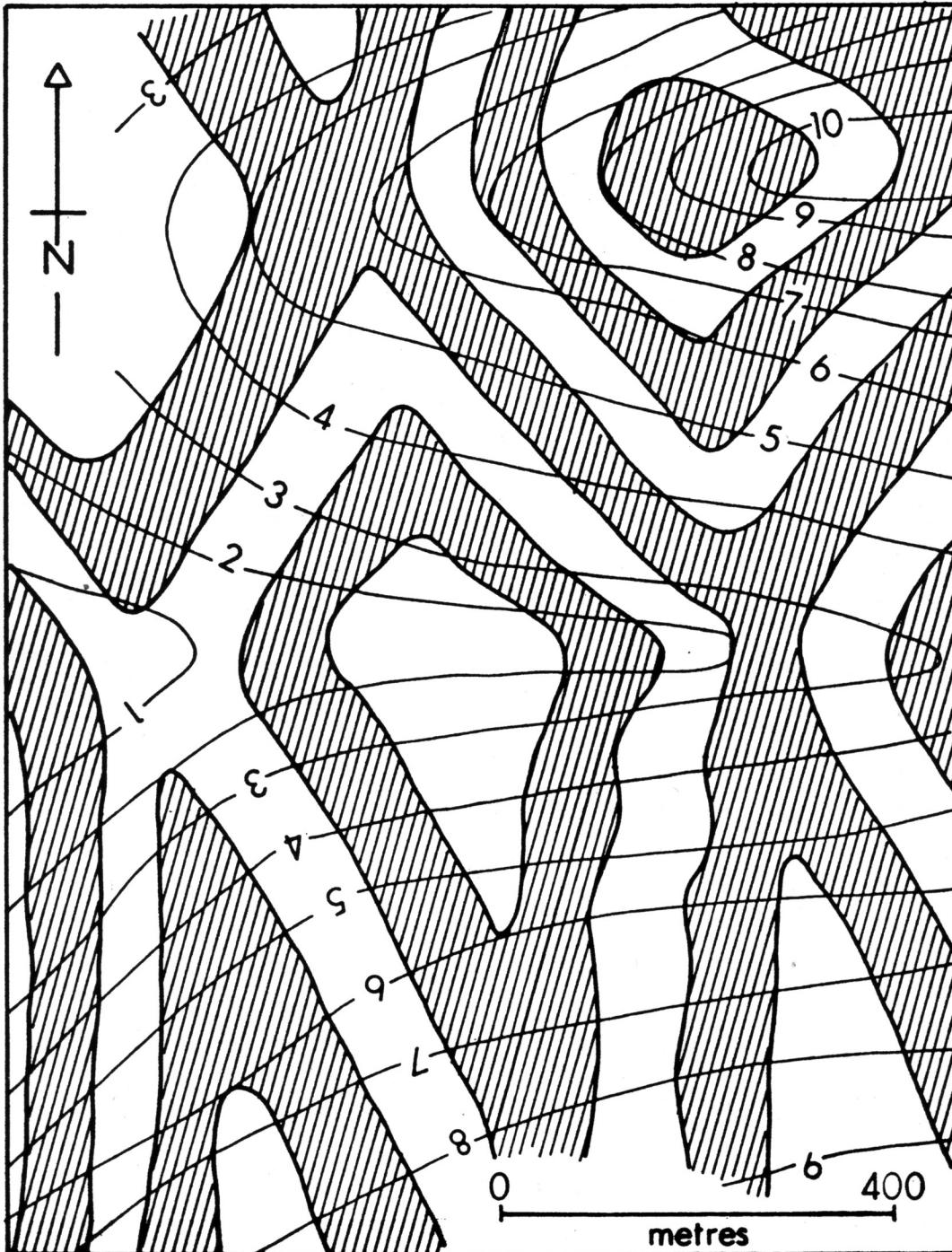**1**. **(a)** Draw the axial traces of the two folds. **(b)** Determine the orientations of their **(i)** limbs, **(ii)** fold axis and **(iii)** axial planes. **(c)** Determine the interlimb angle. **(d)** Are the folds angular or rounded? **(e)** Are the folds parallel or similar? **(f)** Construct an E-W vertical geologic cross-section along the bottom of the map showing the traces of the folded boundaries between map-units and the axial planes of folds. Extend these traces above ground level by means of broken lines.

2. (a) draw the axial traces of the three folds, **(b)** determine the orientations of **i)** the axial planes and **ii)** the fold-axis; **(c)** construct a vertical geologic cross-section from the NE to the SW corners of the map, with SW on the left. **(d)** determine the number of map units and identify them by means of colours on the map and cross-sections.
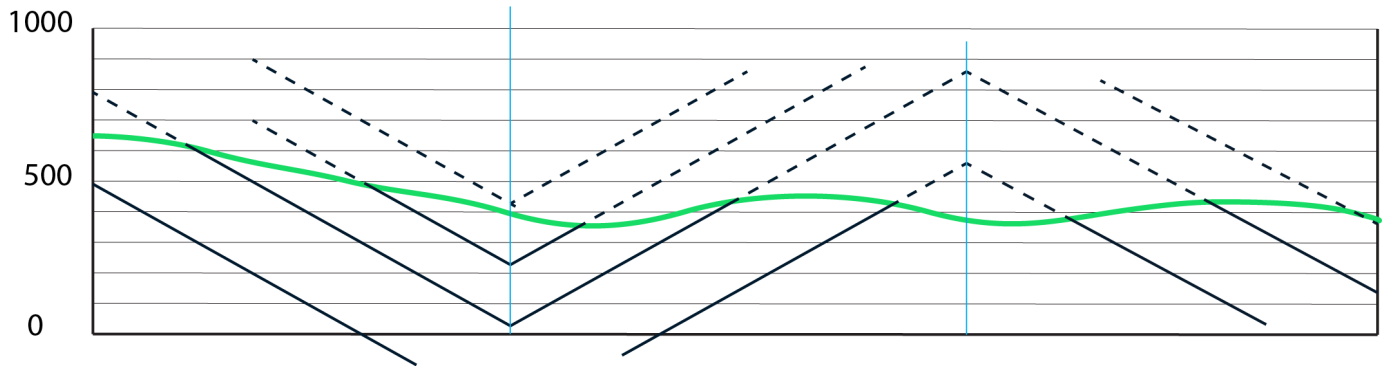

Contour Interval: 100 m

3. i) draw the axial traces of the two folds (assume they are vertical); **ii)** describe the geology of the area represented by the map; **iii)** construct a vertical geologic cross-section along the line XY with X on the left; **iv)** on the map show the subcrop of Unit B beneath Unit D, i.e. the outcrop of B after removal of D.
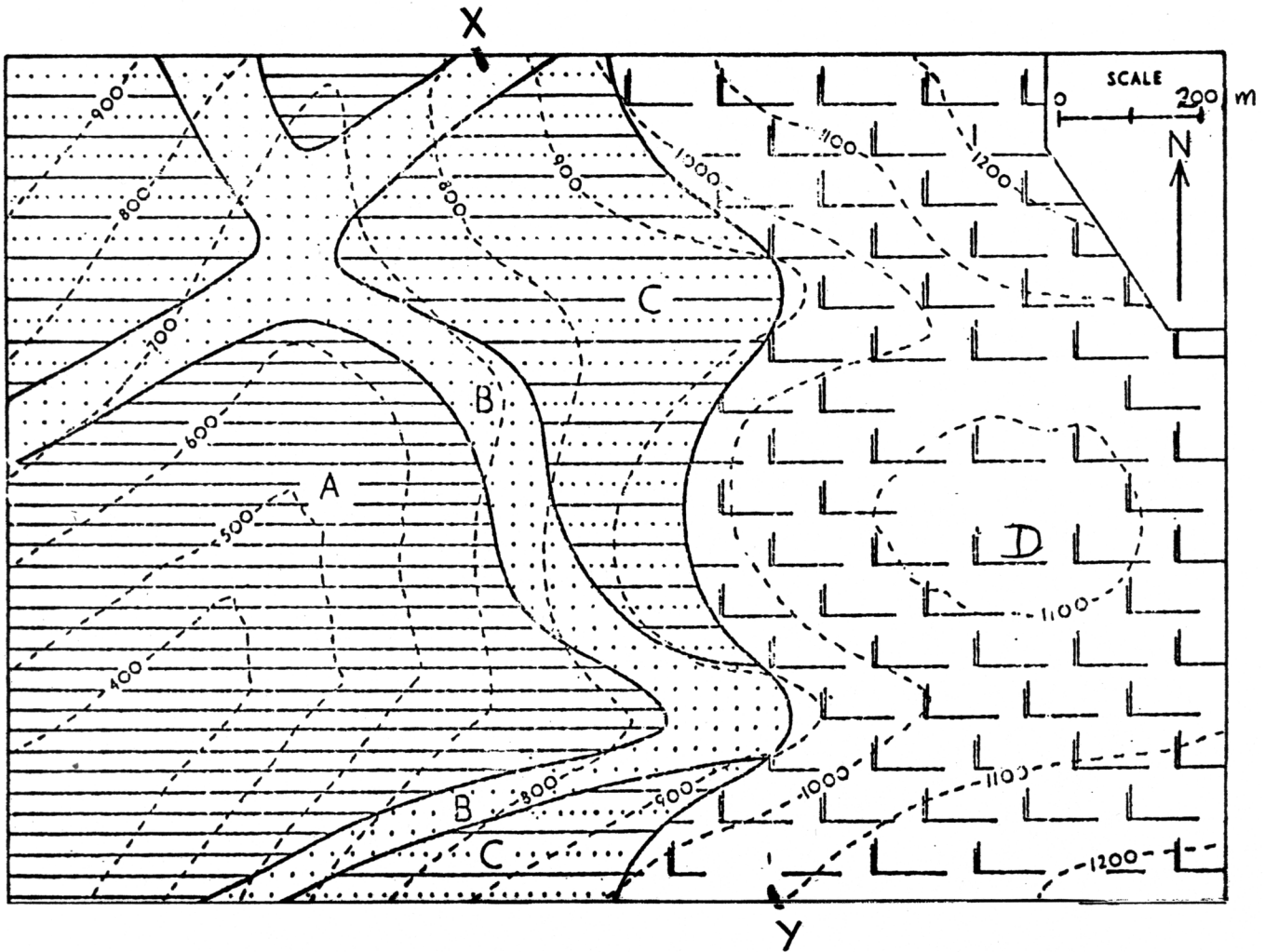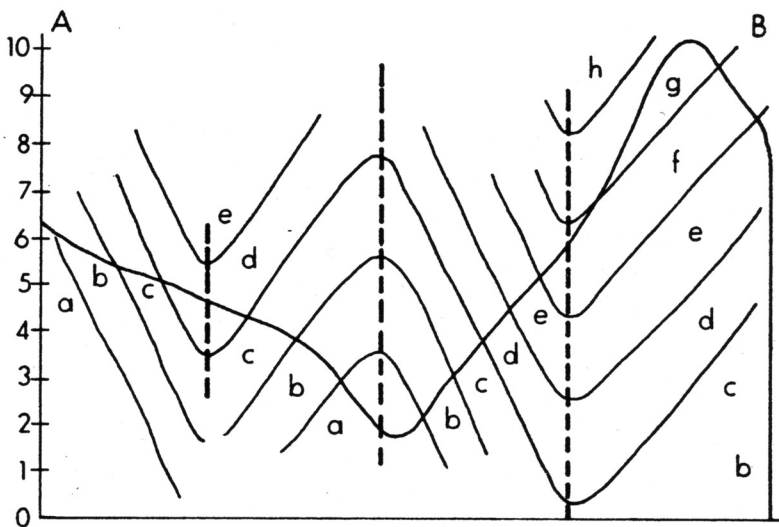
Answers

1

2

3. The area represented by Map 3 is underlain by rocks grouped into four map-units: A, B, C and D. Unit D forms the high ground to the east, Units A-C the low ground to the west. The thicknesses of Units A, C and D are indeterminate but in the order of several hundred metres; the thickness of B ranges from 75 to 90 m, apparently the result of deformation associated with folding. An angular unconformity separates Units A-C from Unit D. Units A-C have been deformed into a syncline to the N and an anticline to the S. The strike of the axial planes is 96°, the dip is indeterminate but probably steep to the N. The fold-axis has an orientation of 96° 0°. The folds have an apical angle of 113° and are chevron and similar in style. The limbs of the folds have orientations of 186° 42° and 6° 26°. The angular unconformity has an orientation of 90° 25°. The geologic history of the area can be broken down into the following events: **(a)** accumulation of Units A-C; **(b)** folding, uplift and erosion; **(c)** deposition of Unit D; **(d)** tilting, uplift and erosion.