Student Number _____ **Student Name:** _____

The University of Melbourne

Semester 1 Assessment, 1995

Department: **School of Earth Sciences**

Subject Number: **625023**

Subject Title: **Geology (Civil Engineering Course)**

Exam Duration: ..... 2 Hours

Reading Time: .....15 minutes

This paper has ..... 9 pages

Authorized materials:

The following items are authorized:

The use of calculators is permitted.

Hand-written personal notes, and the lab manual, may be referred to during the examination.

No other books or papers are permitted.

Instructions to Invigilators:

This paper is all that is required for the examination.

This paper must be handed in at the end of the examination.

Instructions to Students:

Attempt ALL questions.

Write your answers on this paper, and hand it in at the end of the examination.

The marks indicate the relative weighting of the questions in this examination.

The practical segment accounts for 20% of the total assessment.

Use sketches where appropriate and label them clearly.

Student Number _____ **Student Name:** _____

UNIVERSITY OF MELBOURNE
SCHOOL OF EARTH SCIENCES

625-023 **June, 1995**

GEOLOGY FOR ENGINEERS (CIVIL ENGINEERING COURSE)
PRACTICAL EXAMINATION

Time Allowed : **Two (2) Hours** Attempt ALL questions.

The marks indicate the relative weighting of the questions in this examination. The practical segment accounts for 20% of the total assessment.

Use sketches where appropriate and label them clearly.

The use of calculators is permitted.

Hand-written personal notes, and the lab manual, may be referred to during the examination. No other books or papers are permitted.

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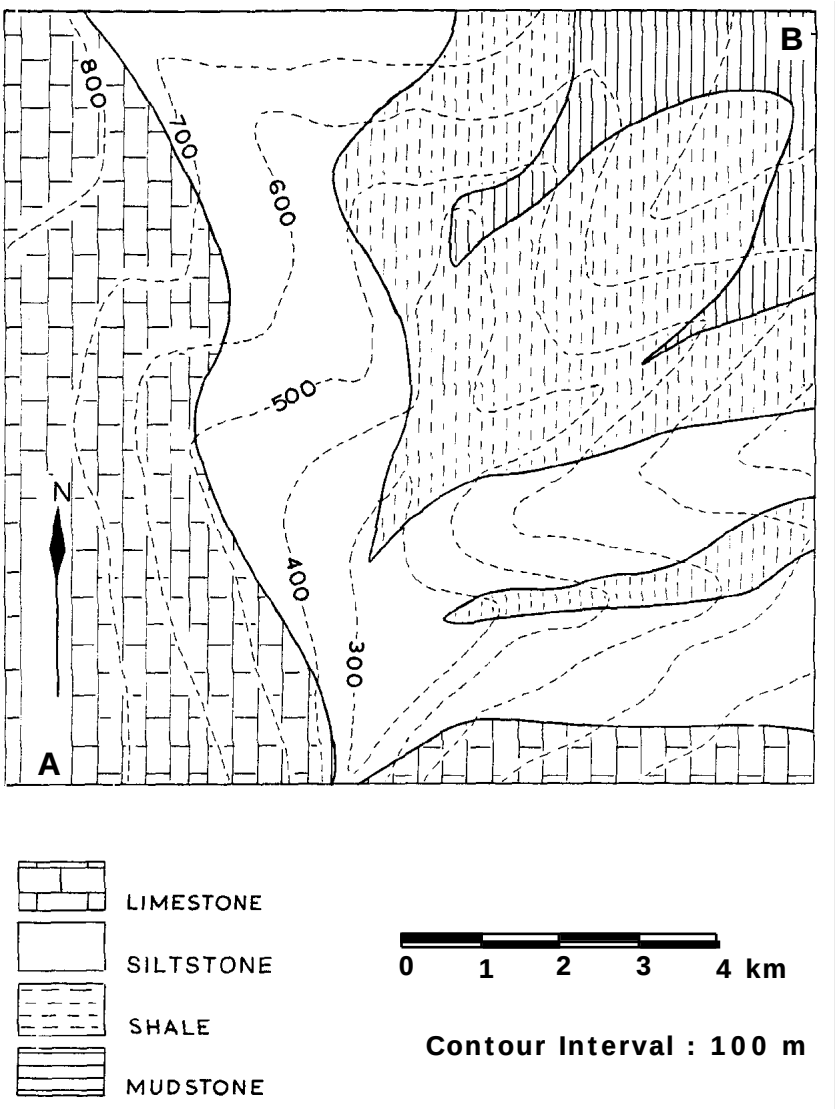
1 (20 marks)

Find the strike, dip, and true thickness of the beds shown in the geological map attached.

	Strike	Dip	True Thickness

In the box below, draw a geological cross-section from the map along the line AB.

700														
600														
500														
400														
300														



2 (12 marks)

Explain how you identify each of the following minerals in hand-specimen:

Quartz

Feldspar

Olivine

3 (12 marks)

List the diagnostic features you consider necessary to identify the following in hand-specimen:

Basalt

Mudstone

Hornfels

4 (30 marks)

Classify, giving your reasons, the three rock specimens provided:

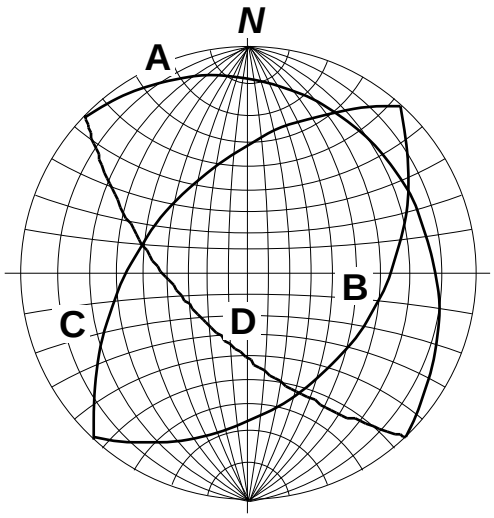
#19 is:_____

#36 is:_____

#79 is:_____

5 (25 marks)

Answer the questions attached to each of the five stereographic projections given below:



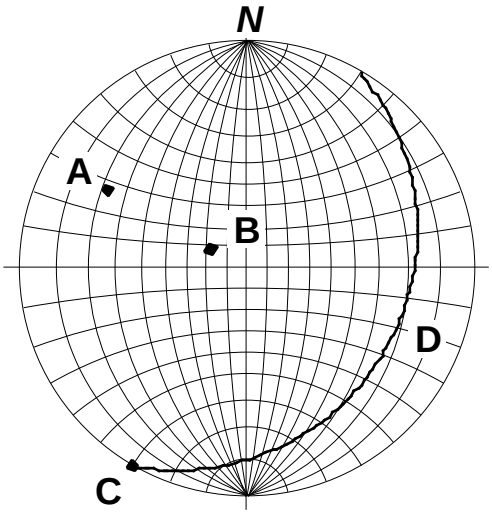
5a

Which of the four planes on this projection dips towards the north west? ☐

What is the strike direction of this plane? ☐

Which of the planes is the most steeply dipping? ☐

What is the strike direction of this plane? ☐

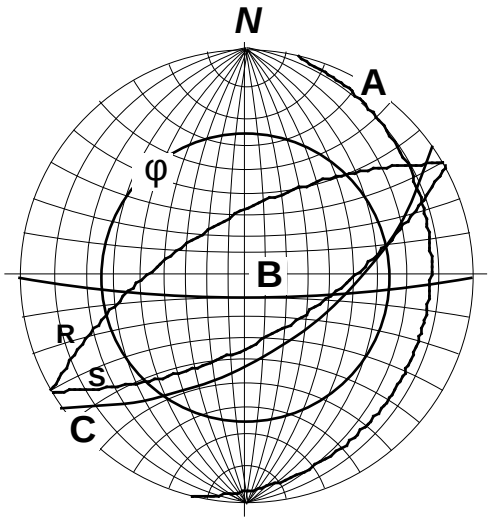


5b

Which of the points labelled A, B, C is the *pole* to the plane represented by D. ☐

What is the approximate direction of dip of this plane? ☐

5c Planes R and S in this projection represent the faces of a cutting on either side of a roadway. At present, they are expected to have equal slope. Small circle φ represents the internal friction for the rocks. A, B, and C represent the average orientation of three joint planes in those rocks.

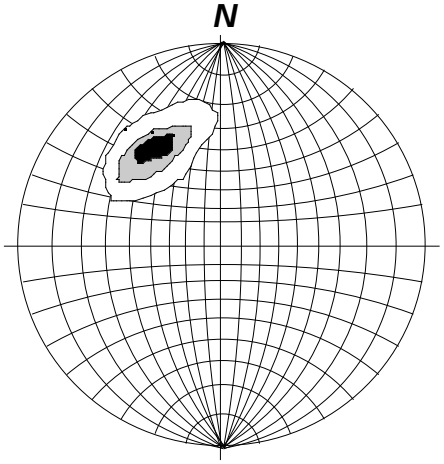


Is there a possibility of wedge failure in this instance? ☐

On which side of the road would failure be expected? ☐

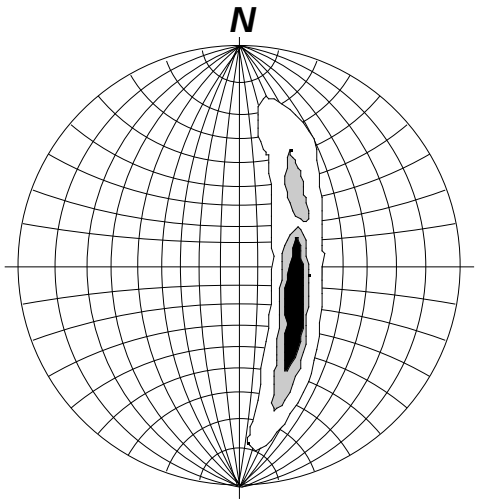
Which pair of joint planes will be involved in the failure? ☐ ☐

5d The contours on this stereographic projection represent the density of poles measured on a bedding plane in some rocks.



What is the approximate average dip and direction of that plane? ☐ ☐

5e The contours on this stereographic projection represent the relative density of poles measured on a surface in a rock outcrop.



What kind of surface would give rise to such a distribution of poles?

A dipping joint plane? ☐

A fold? ☐

A plunging fold? ☐

An unconformity? ☐

Some other surface? ☐

Briefly explain your answer.