



ORDRE DES INGÉNIEURS DU QUÉBEC
MAY 2010 SESSION

Open-book examination
Calculators : only authorized models
Duration: 3 hours

04-MB-14 Geology

Question 1 (10 points)

What is the difference between an orthoquartzite and a greywacke?

Question 2 (10 points)

Limestone is being quarried in one location and quartzite is being quarried in another. Which of the two rock materials would cause greater wear on the shovels, trucks and crushing equipment? Provide explanations.

Question 3 (5 points)

Which is the most common mineralogical group found in the earth crust ?

Question 4 (5 points)

What types of feldspars are expected to be found in granite?

Question 5 (10 points)

Both weathered chert and sound quartz pieces are common constituents in stream gravels. Both have the chemical formula SiO_2 . Yet the weathered chert is an unsound material in concrete when subjected to freezing/thawing cycles, whereas quartz doesn't have this problem. Provide explanations.

Question 6 (10 points)

What are the main geological periods found in the province of Quebec? (5 points) Which was the main agent that has eroded other periods? (5 points)

Question 7 (10 points)

Draw 1) an anticline fold and (5 points) 2) a reverse fault (5 points).

Question 8 (15 points)

A sandy aquifer is confined in a valley, having a V-shape of 100 wide and 800 m deep. The sand average porosity is 30% and its coefficient of permeability is $k = 4.1 \times 10^{-2}$ cm/s. Two wells 500 m apart show a difference in water level of 3 m. Calculate the daily flow of this aquifer.

Question 9 (15 points)

Identify three active seismic zones found in the province of Quebec.

Question 10 (10 points)

Explain what are ophiolites (how and where they are formed) (5 points). What is their interest regarding geology? (5 points)