EOSC 110, sect. 101

Sample study questions for the final exam, supplied by students

Describe all the steps that take place in order for a granitic pluton (formed at depth in the crust) to eventually lead to formation of a quartzite.

Explain five hazards of earthquakes using the Lower Mainland as an example. Why would a very large earthquake in the Lower Mainland be devastating?

Explain how geoscientists can locate earthquakes using seismic waves. What are the types of seismic waves?

Describe the evidence that lead to the theory of plate tectonics.

What are the three types of plate boundaries?

What is the difference between a mineral and a rock?

How is relative time determined?

Discuss physical and chemical weathering processes and the products of each process.

Why are feldspar-rich sedimentary rocks not common?

Describe the life history of a piece of sandstone in detail.

Which of the following is the highest grade metamorphic rock? schist, gabbro, gneiss, slate

What is a migmatite and how does one form?

Discuss the driving forces for metamorphism.

Distinguish between contact and regional metamorphism.

Name and illustrate three types of stress that affect rocks.

Describe temporary versus permanent strain in rocks.

Fossil are not commonly preserved in meta-sedimentary rocks. Why?

What are the differences between normal, reverse, thrust, and strike-slip faults?

How do geologists define the position of a bed of rock in space? What map symbol is used?

Explain the difference between a joint and a fault.

Illustrate why you must look at the structure of the rocks in cross section rather than just on the surface in order to distinguish between an anticline and a syncline.

T or F. Anticlines and synclines always form mountains and valleys, respectively.

Discuss one way that mountains can form <u>without</u> rock deformation.

Describe an orogenic belt and draw a cross-section.

Compare and contrast shield, cinder, and composite volcanoes.

What geologic situation would you look for in order to find oil and gas?

What factors control wave size in the oceans?

Describe three kinds of currents that affect coastal zones.

How do waves cause longshore drift?

What is the difference between tides and tidal currents?

Why are there wide sandy beaches at Spanish Banks but not in West Vancouver?

Suppose a large dam failed. What would be the downstream effect on channel shape and sediment accumulation?

What are the driving forces for mass wasting? What are the triggers? How does vegetation increase slope stability?

What hazards are possible if you build a house on a slope? What techniques are used to decrease or eliminate these hazards?

What are the characteristics of slides, falls, and flows? How do they differ?

Diagram and explain the hydrologic cycle.

Describe the three types of load carried by streams.

What are the characteristics of a valley that contains a balanced energy stream? Use a diagram to help answer this question. Is there net erosion or deposition in this system?

Draw an equilibrium stream profile. Next illustrate a non-equilibrium stream profile. What happens to this system with time?

What is a nickpoint? Are nickpoints natural or man-made?

If you had the money to buy land on a riverbank, with the intent of building your dream home there, would you buy near a cutbank or a point bar? Why?

How does a stream use its energy? How does a glacier use its energy?

What does $Q = V \times A$ refer to?

Identify the agents and describe the processes that form both u-shaped and v-shaped valleys.

Describe the life cycle of a valley glacier from its origin in the mountains to final disappearance, detailing the geomorphic (landscape) changes in the valley.

Why would someone have an illusion that valley glaciers flow uphill? Can they really?

If a mega-earthquake occurred off southern B.C. and the land was uplifted instantaneously by 5 meters, what would be the effect on local streams?

What conditions are necessary to form a glacier? Are glaciers forming in B.C. today? Why or why not?

Explain the conditions necessary for the advance and the retreat of glaciers. What is the equilibrium line?

How are continental glaciers different than alpine glaciers?

How was world climate different during the last Ice Age?

What is isostatic rebound?

What landforms are characteristic of continental glaciation vs. alpine glaciation?

How do cirques form? What is a hanging valley?

What does a terminal moraine mark?

Describe the difference between glacial till and glacial outwash.

What factors lead to an Ice Age?

How can a glacier exist at the Equator?

Why are aquifers and aquitards both important to human lives?

What is the difference between porosity and permeability? Why are both important for a good aquifer?

Which factors are important for the formation of a good groundwater resource? What causes a cone of depression?

Give an example of secondary porosity.

A shallow well in granite produces groundwater. Why might a deep well at the same location not produce groundwater?

As a consulting geologist to a coastal community that is experiencing deteriorating quality of their well water, you are asked to explain salt water intrusion and how one prevents it.

What type of rock is best for a septic field?

How do caves form? What are stalagmites and stalactites?

Explain the difference between a confined and an unconfined aquifer. What is an artesian well?

Is groundwater a renewable resource? Explain.

How can proper landfill construction protect groundwater?

What methods are used to manage a groundwater resource?

List 3 problems associated with the demand for water being greater than the supply. For each, suggest a possible solution.

What are the geological activities of groundwater?

Name three factors that control the formation of waves.

Discuss the concept of winter (high energy) vs. summer (low energy) beaches.

What is longshore drift? Explain the process that controls it.

Describe both erosional and depositional landforms found along coastlines.

Name/illustrate one environmental problem due to human intervention along coastlines and suggest a solution.

Discuss the geologic and tectonic evolution of B.C. over the past 200 m.y.

Which parts of B.C. are tectonically active today, and what types of activity are on-going?

Explain how carbonate ooze in the ocean basins can end up as CO_2 gas coming out of volcanoes. (Use your knowledge of plate tectonic processes).

Explain why intraplate volcanism occurs.

Explain why the north arrow on a compass does not point to the geographic north pole.

Explain the origin of Earth's magnetic field.

Discuss all types of tectonic activity that take place at a convergent plate boundary.

How does Earth maintain isostatic equilibrium?

What do seismic waves tell us about Earth's layers?

Name 4 surface processes for which gravity is the driving force.

What is an orogeny? What part of an orogenic belt is the Canadian Rockies?