|  |  |  |
| --- | --- | --- |
| Title: | | **Quiz: Landslides** |
| Started: | | February 28, 2012 1:10 AM |
| Submitted: | | February 28, 2012 1:38 AM |
| Time spent: | | [00:28:27](javascript:openNewWindow('viewAttemptEventsLog.dowebct?assmtAttemptId=8871057262271','ViewAccessLog','500','500')) |
| **Total score:** | | **14/20 = 70%** https://www.vista.ubc.ca/webct/images/dot_divide.gifTotal score adjusted by 0.0 https://www.vista.ubc.ca/webct/images/dot_divide.gifMaximum possible score: 20 |
| **1.** |  |
|  | |  |  | | --- | --- | | Which of the following statements is FALSE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | Increased pore pressures weaken slopes. |  | | B. | Small amounts of water make slopes more stable. |  | | Student ResponseC. | Extra water favors rotational slides over translational slides. | Student Response | | D. | Large amounts of precipitation weaken slopes. |  | | E. | The weight of water contributes to the likelihood of a landslide. |  | | | | Score: | 1/1 | |  | | |
| **2.** |  |
|  | |  |  | | --- | --- | | The following sentence BEST describes which type of mass movement?  "A cohesive mass of material moves along a flat surface of failure." | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | rock slide | Student Response | | B. | fall |  | | C. | rotational slide |  | | D. | complex movement |  | | E. | flow |  | | | | Score: | 1/1 | |  | | |
| **3.** |  |
|  | |  |  | | --- | --- | | Suppose you are a geological engineer retained to increase the slope stability in steep portions of a mountainside along a busy highway. Which technique would you use to reduce hazards from falling small blocky material? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | remove all unstable blocks |  | | B. | install drains |  | | Student ResponseC. | use cables and bolts to anchor the mass |  | | D. | plant trees |  | | E. | install netting | Student Response | | | | Score: | 0/1 | |  | | |
| **4.** |  |
|  | |  |  | | --- | --- | | The type of slope failure in the diagram (right) shows \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | a toppling failure | Student Response | | B. | a translational planar failure |  | | C. | a translational wedge failure |  | | D. | a channelized debris flow |  | | E. | a channelized avalanche |  | | | | Score: | 1/1 | |  | | |
| **5.** |  |
|  | |  |  | | --- | --- | | Which location is the LEAST landslide-prone? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | North Vancouver |  | | Student ResponseB. | Surrey | Student Response | | C. | Towers Beach (UBC) |  | | D. | Squamish (Mt. Garibaldi) |  | | E. | Lion’s Bay (Sea-to-Sky Highway) |  | | | | Score: | 1/1 | |  | | |
| **6.** |  |
|  | |  |  | | --- | --- | | Which is FALSE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | Increasing the normal stress across the sliding surface helps to increase the frictional strength. |  | | B. | Infiltration of water and increasing pore pressures acts to reduce the shear strength of a rock slope. |  | | Student ResponseC. | The main force acting on a slope is pore pressure and not gravity. | Student Response | | D. | Shear stress is the component of gravity acting parallel to the sliding surface of a landslide. |  | | E. | Faults and cracks weaken the shear strength of a rock slope. |  | | | | Score: | 1/1 | |  | | |
| **7.** |  |
|  | |  |  | | --- | --- | | Which of the following was NOT a factor that contributed to the debris slide at Vaiont Dam, Italy in 1963? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | an earthquake | Student Response | | B. | the presence of limestone and clay |  | | C. | anthropogenic (human) activity |  | | D. | changes in water pressure due to filling/draining of dam |  | | E. | fractured bedrock |  | | | | Score: | 1/1 | |  | | |
| **8.** |  |
|  | |  |  | | --- | --- | | The difference between a debris flow and a debris avalanche is \_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | composition, debris flows contain more boulders and sand and less water than debris avalanches |  | | B. | flow morphologies, debris flows are longer and thinner than debris avalanches |  | | C. | origin, debris flows do not originate in regions with steep topography while debris avalanches do |  | | Student ResponseD. | channelization, debris flows are confined to an established channel while debris avalanches are not | Student Response | | E. | their initial cause, debris flows are caused by earthquakes while debris avalanches are caused by high rainfall |  | | | | Score: | 1/1 | |  | | |
| **9.** |  |
|  | |  |  | | --- | --- | | The landslide that occurred at Turtle Mountain in Alberta in 1903 is classified as a \_\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | long run-out debris flow | Student Response | | B. | small rock fall |  | | C. | slump |  | | D. | lahar |  | | E. | rock block topple |  | | | | Score: | 1/1 | |  | | |
| **10.** |  |
|  | |  |  | | --- | --- | | WATER in a layer of unconsolidated sediment can lead to landslides as a result of \_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | increased pore water pressure | Student Response | | B. | decreased pore water pressure |  | | C. | a decrease in the slide mass |  | | D. | increased cohesion |  | | E. | vegetation growth |  | | | | Score: | 1/1 | |  | | |
| **11.** |  |
|  | |  |  | | --- | --- | | Water may INCREASE the likelihood of a landslide by \_\_\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | increasing cohesion between particles in unconsolidated sediment |  | | B. | decreasing the weight of the resisting mass |  | | C. | reducing pore pressure at the base of a potential slide mass |  | | Student ResponseD. | causing expansion of clay minerals | Student Response | | E. | introducing cement into pore spaces between unconsolidated sediment |  | | | | Score: | 1/1 | |  | | |
| **12.** |  |
|  | |  |  | | --- | --- | | Which statement is TRUE about soil creep? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | It involves the rapid downslope movement of rock. |  | | B. | The expansion and contraction of clay particles with the addition and removal of water has no affect on soil creep. |  | | C. | Blocks of material that are rotated and tilted in the upslope direction indicate soil creep. |  | | Student ResponseD. | It is partially the result of soil expansion parallel to the slope. |  | | E. | Frequent freeze-thaw cycles can accelerate the rate of soil creep. | Student Response | | | | Score: | 0/1 | |  | | |
| **13.** |  |
|  | |  |  | | --- | --- | | A \_\_\_\_\_\_ makes a slope susceptible to movement without actually initiating it while a \_\_\_\_\_\_ initiates movement. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | trigger… cause |  | | B. | driver… trigger |  | | Student ResponseC. | cause… trigger | Student Response | | D. | cause… driver |  | | E. | driver… cause |  | | | | Score: | 1/1 | |  | | |
| **14.** |  |
|  | |  |  | | --- | --- | | Most landslides on record in this province are located in southern British Columbia because \_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | southern B.C. has steeper slopes than the rest of the province |  | | B. | southern B.C. receives more precipitation than the rest of the province |  | | C. | southern B.C. is more at risk from landslides associated with subduction zone earthquakes |  | | D. | the population density is much higher in southern B.C. and so landslides are considered natural disasters | Student Response | | E. | landslides are uncommon in northern B.C. |  | | | | Score: | 0/1 | |  | | |
| **15.** |  |
|  | |  |  | | --- | --- | | Trigger frequency is \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | the speed of a sturzstrom |  | | B. | how often landslides occur |  | | C. | the period of time between earthquakes |  | | Student ResponseD. | how often an event occurs that sets off a landslide | Student Response | | E. | the prevalence of heavy rain in a landslide-prone region |  | | | | Score: | 1/1 | |  | | |
| **16.** |  |
|  | |  |  | | --- | --- | | For the valley shown in the diagram (right), the MOST LIKELY slope failure modes originating from the western (W) and eastern (E) slopes would be \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | topples (W) and translational slides (E) | Student Response | | B. | spreads (W) and rockfalls (E) |  | | C. | translational slides (W) and topples (E) |  | | Student ResponseD. | rockfalls (W) and rotational slides (E) |  | | E. | translational slides (W) and rotational slides (E) |  | | | | Score: | 0/1 | |  | | |
| **17.** |  |
|  | |  |  | | --- | --- | | Which of the following geologic materials has the HIGHEST shear strength? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | clay |  | | B. | soil |  | | Student ResponseC. | intrusive igneous rock | Student Response | | D. | unconsolidated sand |  | | E. | saturated unconsolidated sand |  | | | | Score: | 1/1 | |  | | |
| **18.** |  |
|  | |  |  | | --- | --- | | Which of the following is NOT an indication that a home may be on an unstable slope? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | tilting trees in the back yard |  | | B. | cracks in the driveway pavement |  | | C. | leaking swimming pools |  | | Student ResponseD. | water pooling on the surface during heavy rainfall | Student Response | | E. | a record of previous landslides |  | | | | Score: | 1/1 | |  | | |
| **19.** |  |
|  | |  |  | | --- | --- | | The enormous 1980 Mount St. Helens rockslide \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | was triggered following the massive eruption of the volcano |  | | Student ResponseB. | was triggered independently of the volcanic activity |  | | C. | triggered an earthquake which in turn triggered the volcanic eruption |  | | D. | triggered the massive eruption of the volcano | Student Response | | E. | was triggered by lahars that were flowing down the slope following the eruption |  | | | | Score: | 0/1 | |  | | |
| **20.** |  |
|  | |  |  | | --- | --- | | Which statement is TRUE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | Flows move downslope as a coherent mass. |  | | B. | Translational slides move in a rotational manner, accommodated by deformation of the weak soil. |  | | C. | Liquefaction is usually related to slow creep-like movements of a soil slope. |  | | D. | Topples involve the backward rotation of a rock block, with the toe of the block moving outwards first. |  | | E. | Falls involve the rock detaching from a steep slope along a surface on which little shear displacement takes place. | Student Response | | | | Score: | 0/1 | |

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| --- | --- | --- |
| Title: | | **PQ1 Landslides** |
| Started: | | February 27, 2012 9:13 PM |
| Submitted: | | February 27, 2012 9:13 PM |
| Time spent: | | [00:00:38](javascript:openNewWindow('viewAttemptEventsLog.dowebct?assmtAttemptId=8870437031281','ViewAccessLog','500','500')) |
| **Total score:** | | **4/5 = 80%** https://www.vista.ubc.ca/webct/images/dot_divide.gifTotal score adjusted by 0.0 https://www.vista.ubc.ca/webct/images/dot_divide.gifMaximum possible score: 5 |
| **1.** |  |
|  | |  |  | | --- | --- | | How does a debris slide differ from a debris flow? A debris slide \_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | is composed of different material |  | | B. | moves more slowly than a debris flow |  | | Student ResponseC. | is not confined to a channel | 100% | | D. | does not contain as much water |  | | E. | has a curved surface of failure |  | | | | Score: | 1/1 | |  | | |
| **2.** |  |
|  | |  |  | | --- | --- | | The uniform movement of coherent blocks of material along well-defined, inclined planar surfaces describes a \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | debris slide |  | | B. | complex slide |  | | C. | slump |  | | Student ResponseD. | rock block slide | 100% | | E. | rotational slide |  | | | | Score: | 1/1 | |  | | |
| **3.** |  |
|  | |  |  | | --- | --- | | Which statement is FALSE? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | Shear stress is the component of gravity acting parallel to the slope. |  | | B. | Humans can increase the likelihood of a landslide by adding material to the driving mass. |  | | Student ResponseC. | Slumps are translational slides. | 100% | | D. | Addition of water can either increase or decrease the factor of safety. |  | | E. | Faults and cracks decrease the shear strength of rocks. |  | | | | Score: | 1/1 | |  | | |
| **4.** |  |
|  | |  |  | | --- | --- | | Which statement is FALSE? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | A rotational slide often leaves a crescent-shaped scarp. |  | | B. | Altering the way water drains naturally from steep slopes can have a significant effect on landslide frequency. |  | | Student ResponseC. | If the driving mass equals the resisting mass in a slope then a landslide will occur. | 100% | | D. | Hydrothermal alteration increases the frequency of landslides in volcanically active areas. |  | | E. | Increasing the pore pressure in a slope will decrease slope stability. |  | | | | Score: | 1/1 | |  | | |
| **5.** |  |
|  | |  |  | | --- | --- | | Which is NOT a type of flow? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | soil creep |  | | B. | debris avalanche |  | | C. | sturzstrom |  | | Student ResponseD. | debris flow | 0% | | E. | slump |  | | | | Score: | 0/1 | |

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| --- | --- | --- |
| Title: | | **PQ2 Landslides** |
| Started: | | February 27, 2012 9:28 PM |
| Submitted: | | February 27, 2012 9:29 PM |
| Time spent: | | [00:00:36](javascript:openNewWindow('viewAttemptEventsLog.dowebct?assmtAttemptId=8870490604281','ViewAccessLog','500','500')) |
| **Total score:** | | **4/5 = 80%** https://www.vista.ubc.ca/webct/images/dot_divide.gifTotal score adjusted by 0.0 https://www.vista.ubc.ca/webct/images/dot_divide.gifMaximum possible score: 5 |
| **1.** |  |
|  | |  |  | | --- | --- | | What is the MOST important function of water in a debris flow? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | freeze/thaw within rock fractures initiates a debris flow |  | | B. | water is quite dense and adds weight to the flow |  | | Student ResponseC. | a fully saturated debris flow is able to flow like a fluid | 100% | | D. | trees are more easily added to the flow if they are wet |  | | E. | water molecules hold the particles of the flow together |  | | | | Score: | 1/1 | |  | | |
| **2.** |  |
|  | |  |  | | --- | --- | | Increased vulnerability to landslide hazards may result from all the following EXCEPT for \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | increasing population density |  | | Student ResponseB. | slope stabilization | 100% | | C. | use of marginal land |  | | D. | global warming |  | | E. | rapid land-use change |  | | | | Score: | 1/1 | |  | | |
| **3.** |  |
|  | |  |  | | --- | --- | | Most landslides on record in this province are located in southern British Columbia because \_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | Student ResponseA. | southern B.C. is more at risk from landslides associated with subduction zone earthquakes | 0% | | B. | landslides are uncommon in northern B.C. |  | | C. | the population density is much higher in southern B.C. and so landslides are considered natural disasters |  | | D. | southern B.C. has steeper slopes than the rest of the province |  | | E. | southern B.C. receives more precipitation than the rest of the province |  | | | | Score: | 0/1 | |  | | |
| **4.** |  |
|  | |  |  | | --- | --- | | The 1963 Vaiont landslide disaster \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | balanced public safety with the economics of constructing the dam |  | | B. | occurred with very little warning |  | | Student ResponseC. | represents a series of lessons that must be learned and taken very seriously by future dam builders | 100% | | D. | represents a strong case against the use of hydroelectric power |  | | E. | occurred despite a detailed investigation and analysis of the slope and its stability state |  | | | | Score: | 1/1 | |  | | |
| **5.** |  |
|  | |  |  | | --- | --- | | Which landslide type may cause a significant amount of damage, while posing a low threat to life? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | Student ResponseA. | creep | 100% | | B. | debris flow |  | | C. | quick clay flow |  | | D. | rock fall |  | | E. | massive rock avalanche |  | | | | Score: | 1/1 | |  | | |

**Chapter 4**

**Main Quiz**

|  |  |
| --- | --- |
| **1.** |  |
|  | |  |  | | --- | --- | | The difference between a debris flow and a debris avalanche is \_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | composition, debris flows contain more boulders and sand and less water than debris avalanches |  | | B. | flow morphologies, debris flows are longer and thinner than debris avalanches |  | | C. | their initial cause, debris flows are caused by earthquakes while debris avalanches are caused by high rainfall |  | | Student Response D. | **channelization, debris flows are confined to an established channel while debris avalanches are not** | Student Response | | E. | origin, debris flows do not originate in regions with steep topography while debris avalanches do |  | | | | Score: | 1/1 | |  | | |
| **2.** |  |
|  | |  |  | | --- | --- | | In the factor of safety calculation, increasing pore pressures act to destabilize the slope by \_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student Response A. | **decreasing frictional strength** | Student Response | | B. | decreasing the cohesive strength |  | | C. | adding weight to the slope |  | | D. | decreasing the driving shear forces |  | | E. | increasing the driving force |  | | | | Score: | 1/1 | |  | | |
| **3.** |  |
|  | |  |  | | --- | --- | | The type of slope failure in the diagram (right) shows \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student Response A. | **a toppling failure** | Student Response | | B. | a translational planar failure |  | | C. | a translational wedge failure |  | | D. | a channelized debris flow |  | | E. | a channelized avalanche |  | | | | Score: | 1/1 | |  | | |
| **4.** |  |
|  | |  |  | | --- | --- | | Which statement about flows is FALSE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | Debris flows are common in British Columbia coastal mountains. |  | | B. | Debris flows have higher water content than debris avalanches. |  | | C. | Flows behave like fluids. |  | | D. | Flows can have variable water content. |  | | Student Response E. | **An example of a very fast moving flow (> 75 km/hour) is rock creep.** | Student Response | | | | Score: | 1/1 | |  | | |
| **5.** |  |
|  | |  |  | | --- | --- | | Which of the following is NOT a factor that increases cliff erosion at UBC? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | tides |  | | B. | wave action |  | | C. | precipitation |  | | Student Response D. | **revegetation** | Student Response | | E. | stormwater runoff |  | | | | Score: | 1/1 | |  | | |
| **6.** |  |
|  | |  |  | | --- | --- | | Which of the following statements is FALSE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | Sometimes it is more economical to repair the effects of a landslide than to remove the cause altogether. |  | | B. | A proper site investigation is fundamental for a meaningful slope stability analysis. |  | | Student Response C. | **Landslide frequency in western Canada is equal or less than frequencies in other mountainous and landslide-prone areas around the world.** | Student Response | | D. | Landslides may have several causes, but only one trigger. |  | | E. | The short history of human development in a region makes the evaluation of landslide hazards more difficult. |  | | | | Score: | 1/1 | |  | | |
| **7.** |  |
|  | |  |  | | --- | --- | | The most common trigger of landslides worldwide is \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | volcanoes |  | | B. | earthquakes |  | | C. | falling snow |  | | Student Response D. | **heavy rainfall** | Student Response | | E. | mining |  | | | | Score: | 1/1 | |  | | |
| **8.** |  |
|  | |  |  | | --- | --- | | The ‘prime mover’ of landslides is \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | earthquakes |  | | Student Response B. | **gravity** | Student Response | | C. | deforestation |  | | D. | heavy rainfall |  | | E. | u-hauls |  | | | | Score: | 1/1 | |  | | |
| **9.** |  |
|  | |  |  | | --- | --- | | When the Factor of Safety is < 1 it means that \_\_\_\_\_\_ | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | shear strength > shear stress |  | | B. | shear strength = shear stress |  | | Student Response C. | **shear strength < shear stress** | Student Response | | D. | Gp > Gt |  | | E. | Gp < Gt |  | | | | Score: | 1/1 | |  | | |
| **10.** |  |
|  | |  |  | | --- | --- | | Gravity influences \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | slope composition |  | | B. | trigger frequency |  | | Student Response C. | **shear stress** | Student Response | | D. | precipitation |  | | E. | shear strength |  | | | | Score: | 1/1 | |  | | |
| **11.** |  |
|  | |  |  | | --- | --- | | For the valley shown in the diagram (right), the MOST LIKELY slope failure modes originating from the western (W) and eastern (E) slopes would be \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | **topples (W) and translational slides (E)** | Student Response | | B. | spreads (W) and rockfalls (E) |  | | C. | translational slides (W) and topples (E) |  | | D. | rockfalls (W) and rotational slides (E) |  | | Student Response E. | translational slides (W) and rotational slides (E) |  | | | | Score: | 0/1 | |  | | |
| **12.** |  |
|  | |  |  | | --- | --- | | Which factor of safety represents the most stable slope? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | 0.5 |  | | B. | 1 |  | | C. | 1.5 |  | | D. | 2 |  | | Student Response E. | **2.5** | Student Response | | | | Score: | 1/1 | |  | | |
| **13.** |  |
|  | |  |  | | --- | --- | | Which of the following will ALWAYS INCREASE the likelihood of a landslide? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student Response A. | human activities |  | | B. | **erosion** | Student Response | | C. | low trigger frequency |  | | D. | vegetation |  | | E. | type of material |  | | | | Score: | 0/1 | |  | | |
| **14.** |  |
|  | |  |  | | --- | --- | | Which of the following slopes is LEAST likely to fail? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | a quick clay slope at 5 degrees |  | | B. | a sand slope at 40 degrees |  | | Student Response C. | **a rock slope at 40 degrees** | Student Response | | D. | a rock slope at 90 degrees |  | | E. | a clay slope at 70 degrees |  | | | | Score: | 1/1 | |  | | |
| **15.** |  |
|  | |  |  | | --- | --- | | In quick clays, a "House-of-cards" structure is composed primarily of \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | **unconsolidated clay particles** | Student Response | | Student Response B. | clay particles flowing like liquid |  | | C. | unconsolidated sand particles |  | | D. | sand and water mixture |  | | E. | saturated sand |  | | | | Score: | 0/1 | |  | | |
| **16.** |  |
|  | |  |  | | --- | --- | | A \_\_\_\_\_\_ makes a slope susceptible to movement without actually initiating it while a \_\_\_\_\_\_ initiates movement. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | trigger… cause |  | | B. | driver… trigger |  | | Student Response C. | **cause… trigger** | Student Response | | D. | cause… driver |  | | E. | driver… cause |  | | | | Score: | 1/1 | |  | | |
| **17.** |  |
|  | |  |  | | --- | --- | | Which of the following is NOT an approach to landslide mitigation? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | prevention |  | | Student Response B. | **litigation** | Student Response | | C. | protection |  | | D. | avoidance |  | | E. | relocation |  | | | | Score: | 1/1 | |  | | |
| **18.** |  |
|  | |  |  | | --- | --- | | In the Greater Vancouver area, the region that is most susceptible to lateral spread type landslides is \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | North Vancouver |  | | B. | Vancouver |  | | Student Response C. | Surrey |  | | D. | **Richmond/Delta** | Student Response | | E. | Burnaby/Coquitlam |  | | | | Score: | 0/1 | |  | | |
| **19.** |  |
|  | |  |  | | --- | --- | | Quick clays often lead to what type of landslide? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | rotational slides |  | | B. | translational slides |  | | Student Response C. | **spreads** | Student Response | | D. | flows |  | | E. | topples |  | | | | Score: | 1/1 | |  | | |
| **20.** |  |
|  | |  |  | | --- | --- | | The enormous 1980 Mount St. Helens rockslide \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | **triggered the massive eruption of the volcano** | Student Response | | Student Response B. | was triggered following the massive eruption of the volcano |  | | C. | was triggered by lahars that were flowing down the slope following the eruption |  | | D. | was triggered independently of the volcanic activity |  | | E. | triggered an earthquake which in turn triggered the volcanic eruption |  | | | | Score: | 0/1 | |  | | |

**Practice Quizzes**

|  |  |
| --- | --- |
| **1.** |  |
|  | |  |  | | --- | --- | | The angle of repose is \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | the angle of a slope for which the factor of safety is much greater than one |  | | B. | the angle of a slope for which the factor of safety is less than one |  | | C. | the steepest angle a slope can hold before failure |  | | D. | an ideal that cannot be achieved |  | | Student Response E. | the angle of a slope for which the factor of safety is a little greater than one | 0% | | | | Score: | 0/1 | |  | | |
| **2.** |  |
|  | |  |  | | --- | --- | | Tensioning a rock anchor helps to stabilize a slope by\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | reducing gravity |  | | B. | preventing rain water from infiltrating into the slope and reducing the effective stresses |  | | C. | breaking the rock, allowing it to be easily removed |  | | Student Response D. | **increasing the normal stress and therefore increasing the frictional strength** | 100% | | E. | increasing the tensile strength of the slope |  | | | | Score: | 1/1 | |  | | |
| **3.** |  |
|  | |  |  | | --- | --- | | By definition, a landslide trigger is an external stimulus that \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | causes a near-immediate response by rapidly decreasing stresses |  | | B. | causes a near-immediate response through the formation of a plane of weakness that allows sliding |  | | C. | gradually brings a slope to failure over a long period of time by weakening the slope |  | | Student Response D. | only takes the form of water | 0% | | E. | causes a near-immediate response by rapidly decreasing strength |  | | | | Score: | 0/1 | |  | | |
| **4.** |  |
|  | |  |  | | --- | --- | | Based on how an avalanche starts and moves, which category of mass movement would this type of landslide BEST fit into? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | complex movements |  | | B. | debris flows |  | | C. | rotational slides |  | | D. | falls |  | | Student Response E. | flows | 0% | | | | Score: | 0/1 | |  | | |
| **5.** |  |
|  | |  |  | | --- | --- | | The enormous 1980 Mount St. Helens rockslide \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | was triggered independently of the volcanic activity |  | | Student Response B. | was triggered by lahars that were flowing down the slope following the eruption | 0% | | C. | triggered the massive eruption of the volcano |  | | D. | was triggered following the massive eruption of the volcano |  | | E. | triggered an earthquake which in turn triggered the volcanic eruption |  | | | | Score: | 0/1 | |

|  |  |
| --- | --- |
| **1.** |  |
|  | |  |  | | --- | --- | | Water may INCREASE the likelihood of a landslide by \_\_\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | increasing cohesion between particles in unconsolidated sediment |  | | B. | decreasing the weight of the resisting mass |  | | C. | reducing pore pressure at the base of a potential slide mass |  | | D. | causing expansion of clay minerals |  | | Student Response E. | introducing cement into pore spaces between unconsolidated sediment | 0% | | | | Score: | 0/1 | |  | | |
| **2.** |  |
|  | |  |  | | --- | --- | | How does a debris slide differ from a debris flow? A debris slide \_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | Student Response A. | does not contain as much water | 0% | | B. | moves more slowly than a debris flow |  | | C. | has a curved surface of failure |  | | D. | is not confined to a channel |  | | E. | is composed of different material |  | | | | Score: | 0/1 | |  | | |
| **3.** |  |
|  | |  |  | | --- | --- | | Which of the following slopes is LEAST likely to fail? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | a quick clay slope at 5 degrees |  | | B. | a sand slope at 40 degrees |  | | Student Response C. | **a rock slope at 40 degrees** | 100% | | D. | a rock slope at 90 degrees |  | | E. | a clay slope at 70 degrees |  | | | | Score: | 1/1 | |  | | |
| **4.** |  |
|  | |  |  | | --- | --- | | The 1963 Vaiont landslide disaster \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | balanced public safety with the economics of constructing the dam |  | | B. | occurred despite a detailed investigation and analysis of the slope and its stability state |  | | Student Response C. | **represents a series of lessons that must be learned and taken very seriously by future dam builders** | 100% | | D. | occurred with very little warning |  | | E. | represents a strong case against the use of hydroelectric power |  | | | | Score: | 1/1 | |  | | |
| **5.** |  |
|  | |  |  | | --- | --- | | The Barrier was ORIGINALLY formed by \_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | a large landslide from Mt. Garibaldi |  | | B. | the Cheakamus glacier carving out a vertical face |  | | Student Response C. | **lava cooling as it came in contact with a valley glacier** | 100% | | D. | millions of years of erosion |  | | E. | large vertical displacements along a fault |  | | | | Score: | 1/1 | |  | | |

<LANDSLIDES>

1.

Which of the following is NOT a way to trigger landslides?

Student Response Correct Answer

A. excavation

B. loud noises

C. climate change

D. heavy rainfall

E. earthquakes

Score: 1/1

2.

In the factor of safety calculation, increasing pore pressures act to destabilize the slope by \_\_\_\_\_\_\_\_.

Student Response Correct Answer

A. adding weight to the slope

B. decreasing frictional strength

C. decreasing the cohesive strength

D. increasing the driving force

E. decreasing the driving shear forces

Score: 1/1

3.

Trigger frequency is \_\_\_\_\_\_.

Student Response Correct Answer

A. the speed of a sturzstrom

B. how often landslides occur

C. the period of time between earthquakes

D. how often an event occurs that sets off a landslide

E. the prevalence of heavy rain in a landslide-prone region

Score: 1/1

4.

Most landslides on record in this province are located in southern British Columbia because \_\_\_\_.

Student Response Correct Answer

A. southern B.C. has steeper slopes than the rest of the province

B. landslides are uncommon in northern B.C.

C. southern B.C. receives more precipitation than the rest of the province

D. southern B.C. is more at risk from landslides associated with subduction zone earthquakes

E. the population density is much higher in southern B.C. and so landslides are considered natural disasters

Score: 0/1

5.

Which is TRUE about translational slides?

Student Response Correct Answer

A. They are also called debris flows.

B. They commonly form a series of topographic benches.

C. Failure occurs along well-defined, planar, and inclined surfaces.

D. Blocks of material incorporated in the landslide are commonly rotated and tilted in the upslope direction.

E. They can be readily identified by crescent-shaped scarps on hill slopes.

Score: 1/1

6.

What is the MOST important function of water in a debris flow?

Student Response Correct Answer

A. freeze/thaw within rock fractures initiates a debris flow

B. water is quite dense and adds weight to the flow

C. a fully saturated debris flow is able to flow like a fluid

D. trees are more easily added to the flow if they are wet

E. water molecules hold the particles of the flow together

Score: 1/1

7.

You are asked to recommend appropriate landslide mitigation techniques for use in an arid area composed of highly fractured granite. Which of the following techniques should NOT be included in your proposal?

Student Response Correct Answer

A. build retaining walls

B. reinforce slide mass with rock bolts

C. spray slide mass with shotcrete

D. drain water from interior of the slide mass

E. grade the slope

Score: 1/1

8.

Suppose you are a geological engineer retained to deal with rockfall problems along new sections of the Sea-to-Sky Highway (Highway 99). You need to prevent smaller rock blocks from falling onto the road. Which approach to mitigation would you take?

Student Response Correct Answer

A. Prevention through rock bolts and anchors.

B. Avoidance by closing the highway and selecting an alternative route.

C. Protection by installing netting.

D. Protection by planting trees.

E. Prevention by installing drains.

Score: 1/1

9.

Which statement is FALSE?

Student Response Correct Answer

A. Landslides occur when the resisting mass exceeds the driving mass.

B. Landslides are more likely to occur in mountainous areas with abundant precipitation and exposed soil.

C. Faster moving landslides generate more fatalities.

D. "Landslide" is a general term that includes mass wasting events moving at a range of velocities.

E. Globally, landslide fatalities are typically underestimated as many fatalities are associated with the landslide trigger (earthquakes, floods, etc.) and not the landslide.

Score: 1/1

10.

The NUMBER ONE underlying cause of landslides is \_\_\_\_\_\_\_\_\_\_.

Student Response Correct Answer

A. global warming

B. rock composition

C. amount of precipitation

D. gravity

E. vegetation

Score: 0/1

11.

Which of the following is FALSE about creep?

Student Response Correct Answer

A. Creep occurs slowly.

B. Creep can happen on flat surfaces.

C. Freezing and thawing of surface soil can cause creep.

D. Wetting and drying of surface soil can cause creep.

E. Creep can result in tilted telephone poles and curved tree trunks.

Score: 1/1

12.

In the diagram (to the right) of forces on a hill slope, which letter refers to the shear stress?

Student Response Correct Answer

A.

B.

C.

D.

E.

Score: 1/1

13.

Which of the following geologic materials has the HIGHEST shear strength?

Student Response Correct Answer

A. clay

B. soil

C. intrusive igneous rock

D. unconsolidated sand

E. saturated unconsolidated sand

Score: 1/1

14.

Which of the following may DECREASE the shear strength of unconsolidated sediment?

Student Response Correct Answer

A. increased cementation

B. increased pore pressure

C. decreased surface tension of water

D. decreased electrostatic forces

E. increased compaction and dewatering

Score: 1/1

15.

Which of the following did NOT contribute to the Frank slide in the Eastern Rocky Mountains?

Student Response Correct Answer

A. dissolution cavities in bedrock

B. weak, fractured, and faulted bedrock

C. bedding planes of sedimentary bedrock parallel to the slope

D. wet weather in years preceding the slide

E. removal of vegetation above the slide

Score: 1/1

16.

The following sentence BEST describes which type of mass movement?

"A cohesive mass of material moves along a flat surface of failure."

Student Response Correct Answer

A. rotational slide

B. flow

C. rock slide

D. fall

E. complex movement

Score: 1/1

17.

Which of the following is NOT a factor that increases cliff erosion at UBC?

Student Response Correct Answer

A. tides

B. wave action

C. precipitation

D. revegetation

E. stormwater runoff

Score: 1/1

18.

An unstable slope may be stabilized by \_\_\_\_\_.

Student Response Correct Answer

A. securing the slope with rock bolts

B. steepening the slope

C. adding a protective layer of small to medium-sized rocks

D. allowing water to flow over and infiltrate the slope

E. removing material from the toe of the slope

Score: 1/1

19.

Which landslide type may cause a significant amount of damage, while posing a low threat to life?

Student Response Correct Answer

A. creep

B. debris flow

C. quick clay flow

D. rock fall

E. massive rock avalanche

Score: 1/1

20.

Quick clays often lead to what type of landslide?

Student Response Correct Answer

A. rotational slides

B. translational slides

C. spreads

D. flows

E. topples

Score: 1/1

CBDEC C(B/D)CAD BDCBE CD(A/C)AC

LANDSLIDES

1.

In areas where loose soils are saturated with water, seismic shaking (i.e. from an earthquake) can \_\_\_\_\_.

Student Response Correct Answer

A. trigger numerous rockfalls, endangering cars traveling on highways

B. help to compact the soils, strengthening the slope

C. transform the behaviour of a slope into one that begins to slowly creep

D. cause water pressures to dramatically increase resulting in liquefaction

E. help drain the soils thereby strengthening the slope

Score: 1/1

2.

Liquefaction occurs when pore water pressure \_\_\_\_\_\_\_\_\_\_.

Student Response Correct Answer

A. becomes great enough to eliminate grain-to-grain contacts

B. expands stacks of clay minerals to 4 times their dry size

C. becomes great enough to form puddles on the surface

D. creates a strong vacuum

E. becomes great enough to dissolve cementing material between grains

Score: 1/1

3.

Which of the following is NOT a way to trigger landslides?

Student Response Correct Answer

A. excavation

B. earthquakes

C. loud noises

D. heavy rainfall

E. climate change

Score: 1/1

4.

Lion’s Bay debris retention structure is designed to \_\_\_\_\_\_.

Student Response Correct Answer

A. stop the water and debris in a debris flow

B. stop the water in a debris flow

C. slow the water in debris flow

D. stop the debris in a debris flow

E. lower property values downslope

Score: 1/1

5.

Which statement about causes and triggers of landslides is TRUE?

Student Response Correct Answer

A. Causes can trigger landslides in some situations.

B. Triggers develop instability in a slope.

C. There is usually one cause for a landslide event.

D. There can be many triggers for one event.

E. Causes are always short-lived events.

Score: 1/1

6.

Which statement is TRUE?

Student Response Correct Answer

A. Landslides may develop into another landslide type through time.

B. The UBC Grand Campus Washout of 1935 was caused by a rock slide that led to flooding along University Avenue.

C. Landslide frequency in British Columbia is NOT significantly affected by logging activities.

D. The largest number of quick-clay slope failures recorded in Canada occurred in Ontario.

E. Debris flows are common in British Columbia coastal mountains because of the combined effect of frequent earthquakes and deep water-saturated, loose, silty-sand deposits.

Score: 1/1

7.

A \_\_\_\_\_\_ makes a slope susceptible to movement without actually initiating it while a \_\_\_\_\_\_ initiates movement.

Student Response Correct Answer

A. trigger… cause

B. driver… trigger

C. cause… trigger

D. cause… driver

E. driver… cause

Score: 1/1

8.

The landslide that occurred at Turtle Mountain in Alberta in 1903 is classified as a \_\_\_\_\_\_\_\_\_\_.

Student Response Correct Answer

A. long run-out debris flow

B. small rock fall

C. slump

D. lahar

E. rock block topple

Score: 1/1

9.

A community discovering that their homes are built on a slow creeping landslide will need to \_\_\_\_\_\_.

Student Response Correct Answer

A. plant trees at the bottom of the slope

B. have the geology replaced

C. perform annual maintenance of road and building damage

D. flee and abandon their homes

E. do nothing since there are no concerns

Score: 0/1

10.

Trigger frequency is \_\_\_\_\_\_.

Student Response Correct Answer

A. the speed of a sturzstrom

B. how often landslides occur

C. the period of time between earthquakes

D. how often an event occurs that sets off a landslide

E. the prevalence of heavy rain in a landslide-prone region

Score: 1/1

11.

How does a debris slide differ from a debris flow? A debris slide \_\_\_\_\_\_\_.

Student Response Correct Answer

A. does not contain as much water

B. is not confined to a channel

C. has a curved surface of failure

D. moves more slowly than a debris flow

E. is composed of different material

Score: 1/1

12.

Debris flows are common in our coastal mountains because \_\_\_\_\_.

Student Response Correct Answer

A. of heavy rains falling on steep slopes covered by loose sediments

B. irrigation for golf courses and farming add significant amounts of water to the ground

C. we are situated in a subduction zone that generates increased earthquake activity

D. of increased population density and land development on steep slopes

E. it suits the agenda of large corporations

Score: 1/1

13.

Which statement is FALSE?

Student Response Correct Answer

A. Shear stress is the component of gravity acting parallel to the slope.

B. Humans can increase the likelihood of a landslide by adding material to the driving mass.

C. Slumps are translational slides.

D. Addition of water can either increase or decrease the factor of safety.

E. Faults and cracks decrease the shear strength of rocks.

Score: 1/1

14.

Which of the following is NOT an approach to landslide mitigation?

Student Response Correct Answer

A. prevention

B. litigation

C. protection

D. avoidance

E. relocation

Score: 1/1

15.

WATER in a layer of unconsolidated sediment can lead to landslides as a result of \_\_\_\_\_\_\_.

Student Response Correct Answer

A. vegetation growth

B. a decrease in the slide mass

C. increased cohesion

D. decreased pore water pressure

E. increased pore water pressure

Score: 0/1

16.

In the diagram (to the right) of forces on a hill slope, which letter refers to the shear stress?

Student Response Correct Answer

A.

B.

C.

D.

E.

Score: 1/1

17.

Based on how an avalanche starts and moves, which category of mass movement would this type of landslide BEST fit into?

Student Response Correct Answer

A. falls

B. debris flows

C. flows

D. rotational slides

E. complex movements

Score: 1/1

18.

Gravity influences \_\_\_\_\_\_.

Student Response Correct Answer

A. trigger frequency

B. shear strength

C. shear stress

D. slope composition

E. precipitation

Score: 1/1

19.

Which statement is FALSE?

Student Response Correct Answer

A. The 2005 La Conchita landslide was totally unexpected as the cause for previous landslides in the area had been dealt with.

B. A landslide trigger is the process that pushes the factor of safety to an unsafe number.

C. The most common landslide trigger in western British Columbia is heavy precipitation.

D. One of the underlying causes of the landslide at Frank, Alberta was coal mining.

E. One hypothesis to explain how sturzstroms can flow extremely far and fast is acoustic fluidization.

Score: 1/1

20.

Which landslide type may cause a significant amount of damage, while posing a low threat to life?

Student Response Correct Answer

A. creep

B. debris flow

C. quick clay flow

D. rock fall

E. massive rock avalanche

Score: 1/1

ANSWERS: D, A, E, D, A, A, C, A, C, D, B, A, C, B, E, D, E, C, A, A

Module 4

P. Quiz #1

|  |  |
| --- | --- |
| **1.** |  |
|  | |  |  | | --- | --- | | Debris flows are common in our coastal mountains because \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | of heavy rains falling on steep slopes covered by loose sediments |  | | B. | irrigation for golf courses and farming add significant amounts of water to the ground |  | | Student Response C. | we are situated in a subduction zone that generates increased earthquake activity | 0% | | D. | of increased population density and land development on steep slopes |  | | E. | it suits the agenda of large corporations |  | | | | Score: | 0/1 | |  | | |
| **2.** |  |
|  | |  |  | | --- | --- | | The ‘prime mover’ of landslides is \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | earthquakes |  | | Student Response B. | gravity | 100% | | C. | deforestation |  | | D. | heavy rainfall |  | | E. | u-hauls |  | | | | Score: | 1/1 | |  | | |
| **3.** |  |
|  | |  |  | | --- | --- | | What is the likely return interval of extremely large landslide events (> 20 million m3) in the Southern Canadian Cordillera (the mountains of BC and Alberta)? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | Student Response A. | 25-100 years | 100% | | B. | 500-2000 years |  | | C. | 250-500 years |  | | D. | 1-10 years |  | | E. | 100-250 years |  | | | | Score: | 1/1 | |  | | |
| **4.** |  |
|  | |  |  | | --- | --- | | Which list correctly orders mass movements from slowest to fastest? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | Student Response A. | creep, slump, translational slide, rock fall | 100% | | B. | slump, debris avalanche, rock fall, translational slide |  | | C. | translational slide, slump, rock fall, rock avalanche |  | | D. | slump, creep, loess flow, rock fall |  | | E. | slump, debris flow, translational slide, debris avalanche |  | | | | Score: | 1/1 | |  | | |
| **5.** |  |
|  | |  |  | | --- | --- | | Sturzstroms are a combination of which two landslide types? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | topples and slumps |  | | Student Response B. | falls and translational slides | 100% | | C. | falls and slumps |  | | D. | topples and falls |  | | E. | translational slides and topples |  | | | | Score: | 1/1 | |  | | |

P. Quiz #2

|  |  |
| --- | --- |
| **1.** |  |
|  | |  |  | | --- | --- | | What is the MOST important function of water in a debris flow? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | freeze/thaw within rock fractures initiates a debris flow |  | | B. | water is quite dense and adds weight to the flow |  | | Student Response C. | a fully saturated debris flow is able to flow like a fluid | 100% | | D. | trees are more easily added to the flow if they are wet |  | | E. | water molecules hold the particles of the flow together |  | | | | Score: | 1/1 | |  | | |
| **2.** |  |
|  | |  |  | | --- | --- | | What is the likely return interval of extremely large landslide events (> 20 million m3) in the Southern Canadian Cordillera (the mountains of BC and Alberta)? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | 100-250 years |  | | Student Response B. | 25-100 years | 100% | | C. | 250-500 years |  | | D. | 500-2000 years |  | | E. | 1-10 years |  | | | | Score: | 1/1 | |  | | |
| **3.** |  |
|  | |  |  | | --- | --- | | Which of the following was NOT a factor that contributed to the Frank Slide? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | coal mining |  | | B. | increased shear stress from use of exposives |  | | Student Response C. | unconsolidated glacial sediments on the slopes | 100% | | D. | ~30° (steep) slopes |  | | E. | the type of rock (limestone) that made up the mountain |  | | | | Score: | 1/1 | |  | | |
| **4.** |  |
|  | |  |  | | --- | --- | | Which of the following is NOT an intended use of landslide hazard maps? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | to inform city planners of landslide risks in areas of interest |  | | B. | to help plan the "best" highway route through a mountainous valley |  | | C. | to indicate the level of hazard posed by different landslide types |  | | Student Response D. | to help realtors determine the "best" real estate deals | 100% | | E. | to help select the "best" route or location for an oil pipeline |  | | | | Score: | 1/1 | |  | | |
| **5.** |  |
|  | |  |  | | --- | --- | | Which statement is TRUE? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | Topples involve the backward rotation of a rock block, with the toe of the block moving outwards first. |  | | B. | Translational slides move in a rotational manner, accommodated by deformation of the weak soil. |  | | C. | Liquefaction is usually related to slow creep-like movements of a soil slope. |  | | D. | Flows move downslope as a coherent mass. |  | | Student Response E. | Falls involve the rock detaching from a steep slope along a surface on which little shear displacement takes place. | 100% | | | | Score: | 1/1 | |  | | |

Quiz

|  |  |
| --- | --- |
| **1.** |  |
|  | |  |  | | --- | --- | | By definition, a landslide trigger is an external stimulus that \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | causes a near-immediate response by rapidly decreasing stresses |  | | B. | causes a near-immediate response through the formation of a plane of weakness that allows sliding |  | | C. | gradually brings a slope to failure over a long period of time by weakening the slope |  | | D. | only takes the form of water |  | | Student Response E. | causes a near-immediate response by rapidly decreasing strength | Student Response | | | |  |  | |  | | |
| **2.** |  |
|  | |  |  | | --- | --- | | Gravity influences \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | trigger frequency |  | | B. | slope composition |  | | C. | precipitation |  | | D. | shear strength |  | | Student Response E. | shear stress | Student Response | | | |  |  | |  | | |
| **3.** |  |
|  | |  |  | | --- | --- | | Which of the following factors would be MOST likely to trigger a landslide on the coast of BC? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | earthquake |  | | B. | undercutting |  | | C. | overloading |  | | Student Response D. | heavy rainfall | Student Response | | E. | removal of vegetation |  | | | |  |  | |  | | |
| **4.** |  |
|  | |  |  | | --- | --- | | QUICK CLAY problems are common in what part of Canada? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | British Columbia |  | | B. | Saskatchewan |  | | C. | Manitoba |  | | Student Response D. | Quebec | Student Response | | E. | New Brunswick |  | | | |  |  | |  | | |
| **5.** |  |
|  | |  |  | | --- | --- | | Which of the following was an important contributing factor to the 2005 La Conchita landslide fatalities in Southern California? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | presence of steep, high slopes |  | | B. | presence of weak rocks |  | | C. | prolonged and intense rainfall |  | | D. | presence of a previous landslide |  | | Student Response E. | all of the above | Student Response | | | |  |  | |  | | |
| **6.** |  |
|  | |  |  | | --- | --- | | An unstable slope may be stabilized by \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student Response A. | securing the slope with rock bolts | Student Response | | B. | steepening the slope |  | | C. | adding a protective layer of small to medium-sized rocks | Student Response | | D. | allowing water to flow over and infiltrate the slope |  | | E. | removing material from the toe of the slope |  | | | |  |  | |  | | |
| **7.** |  |
|  | |  |  | | --- | --- | | Which factor of safety represents the most stable slope? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | 0.5 |  | | B. | 1 |  | | C. | 1.5 |  | | D. | 2 |  | | Student Response E. | 2.5 | Student Response | | | |  |  | |  | | |
| **8.** |  |
|  | |  |  | | --- | --- | | What is the MOST important function of water in a debris flow? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | freeze/thaw within rock fractures initiates a debris flow |  | | B. | water is quite dense and adds weight to the flow |  | | Student Response C. | a fully saturated debris flow is able to flow like a fluid | Student Response | | D. | trees are more easily added to the flow if they are wet |  | | E. | water molecules hold the particles of the flow together |  | | | |  |  | |  | | |
| **9.** |  |
|  | |  |  | | --- | --- | | Which of the following is FALSE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | Shear strength is related to friction and cohesion. |  | | B. | Creep causes the most long-term economic damage because it is not often detected until damage is done. |  | | C. | Complex landslides are a combination of two or more different landslide types. |  | | Student Response D. | Landslides are classified according to mass, slope, and velocity. | Student Response | | E. | Hydrothermal alteration can result in lowering the factor of safety of a slope. |  | | | |  |  | |  | | |
| **10.** |  |
|  | |  |  | | --- | --- | | Which of the following statements is FALSE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | A landslide may be stabilized by applying a resisting force at the toe of the slope. |  | | Student Response B. | Stabilization of a landslide may be achieved by clearing the trees from the slope. | Student Response | | C. | The rapid infiltration of rainfall is the mechanism by which most shallow landslides are generated during storms. |  | | D. | Landslides may occur without an apparent trigger because of processes that gradually bring the slope to failure. |  | | E. | High pore pressures may adversely affect the stability of a slope due to a decrease in effective normal stress. |  | | | |  |  | |  | | |
| **11.** |  |
|  | |  |  | | --- | --- | | Which statement is TRUE about soil creep? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | It involves the rapid downslope movement of rock. |  | | B. | The expansion and contraction of clay particles with the addition and removal of water has no affect on soil creep. |  | | C. | Blocks of material that are rotated and tilted in the upslope direction indicate soil creep. |  | | D. | It is partially the result of soil expansion parallel to the slope. |  | | Student ResponseE. | Frequent freeze-thaw cycles can accelerate the rate of soil creep. | Student Response | | | |  |  | |  | | |
| **12.** |  |
|  | |  |  | | --- | --- | | The NUMBER ONE underlying cause of landslides is \_\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | global warming |  | | B. | rock composition |  | | C. | amount of precipitation |  | | Student ResponseD. | gravity | Student Response | | E. | vegetation |  | | | |  |  | |  | | |
| **13.** |  |
|  | |  |  | | --- | --- | | Which statement is FALSE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | Erosion will affect both shear stress and shear strength. |  | | Student Response B. | The likelihood of a landslide is increased when material is added to the resisting mass. | Student Response | | C. | The composition of a slope determines its internal shearing resistance. |  | | D. | The presence of water in varying amounts can either increase OR decrease shear strength. |  | | E. | Vegetation on a slope can increase shear strength. |  | | | |  |  | |  | | |
| **14.** |  |
|  | |  |  | | --- | --- | | Which of the following is FALSE about creep? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | Creep occurs slowly. |  | | B. | Creep can happen on flat surfaces. | Student Response | | C. | Freezing and thawing of surface soil can cause creep. |  | | Student Response D. | Wetting and drying of surface soil can cause creep. |  | | E. | Creep can result in tilted telephone poles and curved tree trunks. |  | | | |  |  | |  | | |
| **15.** |  |
|  | |  |  | | --- | --- | | The difference between an earth fall and a debris fall is that: | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student Response A. | an earth fall is made of sorted soil and a debris fall is made of unsorted material | Student Response | | B. | an earth fall is made of bedrock and a debris fall is made of sorted soil |  | | C. | an earth fall is made of both bedrock and unsorted soil and a debris fall is made only of sorted soil |  | | D. | an earth fall requires that material free-falls and a debris fall requires that material bounces down a slope |  | | E. | an earth fall requires a shallow slope while a debris falls require very steep slopes |  | | | |  |  | |  | | |
| **16.** |  |
|  | |  |  | | --- | --- | | Which would NOT cause a landslide? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | Adding material to the driving mass relative to the resisting mass. |  | | B. | Removing material from the resisting mass relative to the driving mass. |  | | C. | Saturating only the driving mass. |  | | D. | Removing material from the resisting mass and adding the same amount of material to the driving mass. |  | | Student Response E. | Adding the same amount of material to the driving mass and the resisting mass. | Student Response | | | |  |  | |  | | |
| **17.** |  |
|  | |  |  | | --- | --- | | Which of the following is NOT an anthropogenic trigger of landslides? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student Response A. | glacial erosion | Student Response | | B. | irrigation |  | | C. | mining |  | | D. | climate change |  | | E. | deforestation |  | | | |  |  | |  | | |
| **18.** |  |
|  | |  |  | | --- | --- | | With regard to landslide hazards, which location would be the LEAST safe to build your house? | | | Fall05Final-1e.gif | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | A |  | | B. | B |  | | C. | C |  | | Student ResponseD. | D | Student Response | | E. | E |  | | | |  |  | |  | | |
| **19.** |  |
|  | |  |  | | --- | --- | | Quick clays often lead to what type of landslide? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | rotational slides |  | | B. | translational slides |  | | Student Response C. | spreads | Student Response | | D. | flows |  | | E. | topples |  | | | |  |  | |  | | |
| **20.** |  |
|  | |  |  | | --- | --- | | A slump \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | is a translational slide |  | | B. | is a faster version of rock creep |  | | C. | is characterized by the forward rotation of material about a pivot point on a slope |  | | D. | requires that materials behave in a fluid-like manner |  | | Student Response E. | occurs along a concave surface | Student Response | | | |  |  | |  | | |
| 1. |  |
|  | |  |  | | --- | --- | | In the diagram (to the right) of forces on a hill slope, which letter refers to the shear stress? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. |  |  | | B. |  |  | | C. |  |  | | Student Response D. |  | Student Response | | E. |  |  | | | | Score: | 1/1 | |  | | |
| 2. |  |
|  | |  |  | | --- | --- | | The ‘prime mover’ of landslides is \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | earthquakes |  | | Student Response B. | gravity | Student Response | | C. | deforestation |  | | D. | heavy rainfall |  | | E. | u-hauls |  | | | | Score: | 1/1 | |  | | |
| 3. |  |
|  | |  |  | | --- | --- | | Shear strength directly depends on which of the following? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student Response A. | slope composition | Student Response | | B. | slope gradient |  | | C. | shear stress |  | | D. | earthquake frequencies |  | | E. | gravity |  | | | | Score: | 1/1 | |  | | |
| 4. |  |
|  | |  |  | | --- | --- | | Which of the following was NOT a factor that contributed to the debris slide at Vaiont Dam, Italy in 1963? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | the presence of limestone and clay |  | | B. | fractured bedrock |  | | C. | an earthquake | Student Response | | Student Response D. | changes in water pressure due to filling/draining of dam |  | | E. | anthropogenic (human) activity |  | | | | Score: | 0/1 | |  | | |
| 5. |  |
|  | |  |  | | --- | --- | | The NUMBER ONE underlying cause of landslides is \_\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | global warming |  | | B. | rock composition |  | | Student Response C. | amount of precipitation |  | | D. | gravity | Student Response | | E. | vegetation |  | | | | Score: | 0/1 | |  | | |
| 6. |  |
|  | |  |  | | --- | --- | | Which of the following statements is FALSE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | Shear strength counteracts shear stress. |  | | B. | The term landslide is a generic term and can include mass movements of varying velocities and types. |  | | Student Response C. | The factor of safety is the ratio of shear stress to shear strength. | Student Response | | D. | Shear stress acts perpendicular to normal stress. |  | | E. | Slope failure will occur when the factor of safety is less than 1.0. |  | | | | Score: | 1/1 | |  | | |
| 7. |  |
|  | |  |  | | --- | --- | | Most landslides on record in this province are located in southern British Columbia because \_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | the population density is much higher in southern B.C. and so landslides are considered natural disasters | Student Response | | B. | landslides are uncommon in northern B.C. |  | | C. | southern B.C. is more at risk from landslides associated with subduction zone earthquakes |  | | D. | southern B.C. receives more precipitation than the rest of the province |  | | Student Response E. | southern B.C. has steeper slopes than the rest of the province |  | | | | Score: | 0/1 | |  | | |
| 8. |  |
|  | |  |  | | --- | --- | | Which of the following slopes is LEAST likely to fail? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | a quick clay slope at 5 degrees |  | | B. | a sand slope at 40 degrees |  | | Student Response C. | a rock slope at 40 degrees | Student Response | | D. | a rock slope at 90 degrees |  | | E. | a clay slope at 70 degrees |  | | | | Score: | 1/1 | |  | | |
| 9. |  |
|  | |  |  | | --- | --- | | The difference between an earth fall and a debris fall is that: | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student Response A. | an earth fall is made of sorted soil and a debris fall is made of unsorted material | Student Response | | B. | an earth fall is made of bedrock and a debris fall is made of sorted soil |  | | C. | an earth fall is made of both bedrock and unsorted soil and a debris fall is made only of sorted soil |  | | D. | an earth fall requires that material free-falls and a debris fall requires that material bounces down a slope |  | | E. | an earth fall requires a shallow slope while a debris falls require very steep slopes |  | | | | Score: | 1/1 | |  | | |
| 10. |  |
|  | |  |  | | --- | --- | | Tensioning a rock anchor helps to stabilize a slope by\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | reducing gravity |  | | B. | preventing rain water from infiltrating into the slope and reducing the effective stresses |  | | C. | breaking the rock, allowing it to be easily removed |  | | Student Response D. | increasing the normal stress and therefore increasing the frictional strength | Student Response | | E. | increasing the tensile strength of the slope |  | | | | Score: | 1/1 | |  | | |
| 11. |  |
|  | |  |  | | --- | --- | | In the Vaiont Dam disaster, \_\_\_\_\_\_\_\_ was both a cause and a trigger for the slide. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | overloading |  | | Student Response B. | water | Student Response | | C. | inherently weak materials in the slope |  | | D. | adverse bedding orientation |  | | E. | removal of vegetation |  | | | | Score: | 1/1 | |  | | |
| 12. |  |
|  | |  |  | | --- | --- | | Lion’s Bay debris retention structure is designed to \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | stop the water and debris in a debris flow |  | | B. | stop the water in a debris flow |  | | C. | slow the water in debris flow |  | | Student Response D. | stop the debris in a debris flow | Student Response | | E. | lower property values downslope |  | | | | Score: | 1/1 | |  | | |
| 13. |  |
|  | |  |  | | --- | --- | | What is the MOST important function of water in a debris flow? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | freeze/thaw within rock fractures initiates a debris flow |  | | B. | water is quite dense and adds weight to the flow |  | | Student Response C. | a fully saturated debris flow is able to flow like a fluid | Student Response | | D. | trees are more easily added to the flow if they are wet |  | | E. | water molecules hold the particles of the flow together |  | | | | Score: | 1/1 | |  | | |
| 14. |  |
|  | |  |  | | --- | --- | | Which statement is FALSE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | Erosion will affect both shear stress and shear strength. |  | | Student Response B. | The likelihood of a landslide is increased when material is added to the resisting mass. | Student Response | | C. | The composition of a slope determines its internal shearing resistance. |  | | D. | The presence of water in varying amounts can either increase OR decrease shear strength. |  | | E. | Vegetation on a slope can increase shear strength. |  | | | | Score: | 1/1 | |  | | |
| 15. |  |
|  | |  |  | | --- | --- | | For the valley shown in the diagram (right), the MOST LIKELY slope failure modes originating from the western (W) and eastern (E) slopes would be \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student Response A. | topples (W) and translational slides (E) | Student Response | | B. | spreads (W) and rockfalls (E) |  | | C. | translational slides (W) and topples (E) |  | | D. | rockfalls (W) and rotational slides (E) |  | | E. | translational slides (W) and rotational slides (E) |  | | | | Score: | 1/1 | |  | | |
| 16. |  |
|  | |  |  | | --- | --- | | Increased vulnerability to landslide hazards may result from all of the following EXCEPT \_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | logging on unstable slopes |  | | B. | deep infiltration of water |  | | C. | clearcutting |  | | Student Response D. | legislation | Student Response | | E. | urbanization |  | | | | Score: | 1/1 | |  | | |
| 17. |  |
|  | |  |  | | --- | --- | | The 1963 Vaiont landslide disaster \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | represents a strong case against the use of hydroelectric power |  | | B. | occurred despite a detailed investigation and analysis of the slope and its stability state |  | | C. | balanced public safety with the economics of constructing the dam |  | | D. | occurred with very little warning |  | | Student Response E. | represents a series of lessons that must be learned and taken very seriously by future dam builders | Student Response | | | | Score: | 1/1 | |  | | |
| 18. |  |
|  | |  |  | | --- | --- | | Landslides are most likely to occur if \_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student Response A. | the factor of safety goes below 1.0 | Student Response | | B. | the shear stress is exceeded by the shear strength |  | | C. | the water is evacuated from a slope |  | | D. | the weather has been dry for an extended period of time |  | | E. | vegetation is covering the slope |  | | | | Score: | 1/1 | |  | | |
| 19. |  |
|  | |  |  | | --- | --- | | Quick clays often lead to what type of landslide? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | rotational slides |  | | B. | translational slides |  | | Student Response C. | spreads | Student Response | | D. | flows |  | | E. | topples |  | | | | Score: | 1/1 | |  | | |
| 20. |  |
|  | |  |  | | --- | --- | | A slump \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | is a translational slide |  | | B. | is a faster version of rock creep |  | | C. | is characterized by the forward rotation of material about a pivot point on a slope |  | | D. | requires that materials behave in a fluid-like manner |  | | Student Response E. | occurs along a concave surface | Student Response | | | | Score: | 1/1 | |

**Chapter 4: Landslides**

|  |  |
| --- | --- |
| **1.** |  |
|  | |  |  | | --- | --- | | Landslide fatalities are typically underestimated because \_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | many fatalities are associated with the landslide trigger (e.g. an earthquake or flood) and not the landslide | Student Response | | B. | most landslides occur in regions where few people live |  | | C. | most local governments wish to avoid any charges of negligence and grounds for litigation |  | | D. | the nature of the injuries often sustained do not immediately result in death |  | | E. | tourists fail to register with local governmental agencies |  | | | | Score: | 1/1 | |  | | |
| **2.** |  |
|  | |  |  | | --- | --- | | Most landslides on record in this province are located in southern British Columbia because \_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | southern B.C. is more at risk from landslides associated with subduction zone earthquakes |  | | B. | landslides are uncommon in northern B.C. |  | | C. | the population density is much higher in southern B.C. and so landslides are considered natural disasters | Student Response | | D. | southern B.C. receives more precipitation than the rest of the province |  | | Student ResponseE. | southern B.C. has steeper slopes than the rest of the province |  | | | | Score: | 0/1 | |  | | |
| **3.** |  |
|  | |  |  | | --- | --- | | Which statement about flows is FALSE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | They can have a range of water contents. |  | | B. | Debris flows form a distinctive debris fan at the mouth of the channel. |  | | C. | They are always characterized by turbulent flow. |  | | D. | They can be composed of a range of material sizes. |  | | Student ResponseE. | They always move at velocities less than 10 km/hour. | Student Response | | | | Score: | 1/1 | |  | | |
| **4.** |  |
|  | |  |  | | --- | --- | | Which of the following was an important contributing factor to the 2005 La Conchita landslide fatalities in Southern California? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | presence of steep, high slopes |  | | B. | presence of weak rocks |  | | C. | prolonged and intense rainfall |  | | D. | presence of a previous landslide |  | | Student ResponseE. | all of the above | Student Response | | | | Score: | 1/1 | |  | | |
| **5.** |  |
|  | |  |  | | --- | --- | | The ‘prime mover’ of landslides is \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | earthquakes |  | | Student ResponseB. | gravity | Student Response | | C. | deforestation |  | | D. | heavy rainfall |  | | E. | u-hauls |  | | | | Score: | 1/1 | |  | | |
| **6.** |  |
|  | |  |  | | --- | --- | | With regard to landslide hazards, which location would be the LEAST safe to build your house? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | A |  | | B. | B |  | | Student ResponseC. | C |  | | D. | D | Student Response | | E. | E |  | | | | Score: | 0/1 | |  | | |
| **7.** |  |
|  | |  |  | | --- | --- | | Gravity influences \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | shear stress | Student Response | | B. | trigger frequency |  | | C. | slope composition |  | | D. | shear strength |  | | E. | precipitation |  | | | | Score: | 1/1 | |  | | |
| **8.** |  |
|  | |  |  | | --- | --- | | Which of the following is NOT an approach to landslide mitigation? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | prevention |  | | Student ResponseB. | litigation | Student Response | | C. | protection |  | | D. | avoidance |  | | E. | relocation |  | | | | Score: | 1/1 | |  | | |
| **9.** |  |
|  | |  |  | | --- | --- | | In the Vaiont Dam disaster, \_\_\_\_\_\_\_\_ was both a cause and a trigger for the slide. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | water | Student Response | | B. | removal of vegetation |  | | C. | overloading |  | | D. | adverse bedding orientation |  | | E. | inherently weak materials in the slope |  | | | | Score: | 1/1 | |  | | |
| **10.** |  |
|  | |  |  | | --- | --- | | Which of the following causes of landslides is LEAST important in British Columbia? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | climate |  | | B. | slope angle |  | | Student ResponseC. | quick clays | Student Response | | D. | removal of vegetation |  | | E. | overloading |  | | | | Score: | 1/1 | |  | | |
| **11.** |  |
|  | |  |  | | --- | --- | | Based on how an avalanche starts and moves, which category of mass movement would this type of landslide BEST fit into? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | flows |  | | B. | rotational slides |  | | Student ResponseC. | complex movements | Student Response | | D. | falls |  | | E. | debris flows |  | | | | Score: | 1/1 | |  | | |
| **12.** |  |
|  | |  |  | | --- | --- | | According to the landslide classification, the term ‘earth’ is defined as \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | sorted soil | Student Response | | B. | all unconsolidated sediment greater than 2 cm in diameter |  | | C. | unsorted soil |  | | D. | a combination of broken trees and earth |  | | E. | a mixture of sand and clay |  | | | | Score: | 1/1 | |  | | |
| **13.** |  |
|  | |  |  | | --- | --- | | A landslide will MOST LIKELY occur in which of the following scenarios? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | A hillside with a slope of 12° composed of a saturated soil layer with abundant vegetation. |  | | B. | A hillside with a slope of 20° composed entirely of granite in an arid environment. |  | | C. | A hillside with a slope of 12° composed of fractured sandstone in an arid environment. |  | | Student ResponseD. | A hillside with a slope of 20° composed of fractured sandstone in a wet environment. | Student Response | | E. | A hillside with a slope of 20° composed of fractured sandstone with abundant vegetation. |  | | | | Score: | 1/1 | |  | | |
| **14.** |  |
|  | |  |  | | --- | --- | | A translational slide \_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | has mass that may remain basically coherent or may deform and form a debris slide | Student Response | | B. | leaves a crescent-shaped scarp |  | | C. | is also called a slump |  | | D. | is a type of rotational slide where coherent blocks of material are transported downhill very quickly |  | | Student ResponseE. | is identified by its backward-tilted head |  | | | | Score: | 0/1 | |  | | |
| **15.** |  |
|  | |  |  | | --- | --- | | In the following diagram of forces on a hill slope, which letter refers to the SHEAR STRESS? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | A |  | | B. | B |  | | C. | C |  | | D. | D |  | | Student ResponseE. | E | Student Response | | | | Score: | 1/1 | |  | | |
| **16.** |  |
|  | |  |  | | --- | --- | | Increased vulnerability to landslide hazards may result from \_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | increasing population density |  | | B. | use of marginal land |  | | C. | rapid land-use change |  | | D. | global warming |  | | Student ResponseE. | All of the above | Student Response | | | | Score: | 1/1 | |  | | |
| **17.** |  |
|  | |  |  | | --- | --- | | Which of the following is FALSE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | Shear strength is related to friction and cohesion. |  | | B. | Creep causes the most long-term economic damage because it is not often detected until damage is done. |  | | C. | Complex landslides are a combination of two or more different landslide types. |  | | Student ResponseD. | Landslides are classified according to mass, slope, and velocity. | Student Response | | E. | Hydrothermal alteration can result in lowering the factor of safety of a slope. |  | | | | Score: | 1/1 | |  | | |
| **18.** |  |
|  | |  |  | | --- | --- | | Which location is the LEAST landslide-prone? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | North Vancouver |  | | B. | Squamish (Mt. Garibaldi) |  | | Student ResponseC. | Surrey | Student Response | | D. | Towers Beach (UBC) |  | | E. | Lion’s Bay (Sea-to-Sky Highway) |  | | | | Score: | 1/1 | |  | | |
| **19.** |  |
|  | |  |  | | --- | --- | | Sturzstroms are a combination of which two landslide types? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | falls and slumps |  | | B. | topples and slumps |  | | C. | topples and falls |  | | Student ResponseD. | falls and translational slides | Student Response | | E. | translational slides and topples |  | | | | Score: | 1/1 | |  | | |
| **20.** |  |
|  | |  |  | | --- | --- | | A slump \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | is a translational slide |  | | B. | is a faster version of rock creep |  | | C. | is characterized by the forward rotation of material about a pivot point on a slope |  | | D. | requires that materials behave in a fluid-like manner |  | | Student ResponseE. | occurs along a concave surface | Student Response | | | | Score: | 1/1 | |