

Student: \_\_\_\_\_

1. Mass wasting
  - A. Is a formal term for the weathering of rock masses.
  - B. Represents the process of lava flow.
  - C. Is the movement of material (rock or soil) down slope due to gravity.
  - D. Is the movement of material by wind.
2. Mass movements owing to downslope pull is called
  - A. Shear strength.
  - B. Shear pull.
  - C. Shear power.
  - D. Shear stress.
3. The steepest stable slope that an unconsolidated material can maintain is the material's
  - A. Shear strength.
  - B. Angle of repose.
  - C. Cohesion.
  - D. Scarp.
4. An over steepened slope
  - A. Is one that has been carelessly modified by human activity.
  - B. Is an aspect of slope processes that results only from tectonic deformation.
  - C. Is a concept that pertains only to slopes in rock.
  - D. Is one that has an angle greater than the angle of repose for the material comprising the slope.
5. Addition of water to soil on slopes may
  - A. Stabilize the soil by freezing and thawing.
  - B. Stabilize the soil by increasing pore pressure.
  - C. Destabilize the slope by reducing frictional resistance to sliding.
  - D. Destabilize the slope by decreasing the slope angle.
6. Rock falls
  - A. Occur only on mountain sides in dry climates.
  - B. Occur on any steep-faced cliff, including under waterfalls.
  - C. Cause the "nick point" in a stream to migrate downstream with time.
  - D. Are unaffected by waves slamming against the base of a sea cliff.
7. Slumps are characterized by
  - A. Complete mixing of earth materials as it moves down slope.
  - B. Liquefaction.
  - C. Somewhat coherent pieces of earth that rotate on a curved surface.
  - D. Lateral spreading.
8. Quick clay is
  - A. A marine deposited mixture of glacially derived clay and silt weakened by infiltrating fresh water upon uplift of these sediments above sea level.
  - B. Clay that expands when wet, contracts when dry.
  - C. Clay that forms very steep cliffs, which slide rapidly when they fall.
  - D. Clay that is too unstable for plants to grow on.

9. Unconsolidated material is likely to be involved in which kinds of mass movement?
  - A. Block glides, rock falls and rock creep
  - B. Creep, slumps and avalanches
  - C. Talus piles
  - D. Consolidation
10. The coarse material that gathers at the foot of the slope which results in rockfalls is called
  - A. Debris.
  - B. Talus.
  - C. Detritus.
  - D. Clastic.
11. Debris flows
  - A. May move rapidly and transport rock materials of greatly different size.
  - B. Are common in semi-arid regions.
  - C. Are not fluids in their behavior, but are dry flows of material.
  - D. Both may move rapidly and transport rock materials of greatly different size and are common in semi-arid regions are correct.
12. This type of mass wasting is a hazard within Yosemite National Park
  - A. Slumps.
  - B. Rock slides and rock falls.
  - C. Debris flows.
  - D. Rock creep.
13. Which of the following is the slowest form of mass movement?
  - A. Soil creep
  - B. Slumps
  - C. Rock falls
  - D. Rock slides
14. Which of the following is the fastest form of mass movement?
  - A. Soil creep
  - B. Debris flow
  - C. Earth flow
  - D. Rockfall
15. When wet soil moves slowly over an impermeable surface the phenomenon observed is called
  - A. Solifluction.
  - B. Permafrost.
  - C. Rock slide.
  - D. Rockfall.
16. All of the following could increase the risk of landslide on a slope except
  - A. Use of septic tanks.
  - B. Building a house on the slope.
  - C. Planting shrubs with extensive root systems.
  - D. Adding fill at the top of the slope to build a road.
17. The type of clay that can absorb water up to twenty times its weight and results in the formation of a weak gel is
  - A. Kaolinite.
  - B. Calcite.
  - C. Montmorillonite.
  - D. All the choices are correct.

18. Vegetation may
- A. Increase slope stability because roots help hold soil in place.
  - B. Decrease slope stability by adding weight.
  - C. Increase slope stability by taking up moisture.
  - D. Any one of the scenarios.
19. Construction of a reservoir behind a dam
- A. Stabilizes the sides of the reservoir walls; the water buoys them up.
  - B. Can destabilize the slopes by increasing pore fluid pressure.
  - C. Destabilizes the slopes because of the weight of the dam.
  - D. Has no effect on slope stability.
20. Soil creep
- A. Cannot be recognized or detected because it is such a slow process.
  - B. Is more of a hazard to property than to lives.
  - C. Commonly triggers snow avalanches because it makes overlying snow unstable.
  - D. All of the choices are correct.
21. The reason clay minerals (and other phyllosilicate) often form the slip plane for a landslide is that they
- A. Have platy structures, allowing them to stack up and then slip past each other, like a deck of cards and also have high porosity.
  - B. Have rigid structures that can trap oil and the oil acts as a lubricant for the landslide.
  - C. Are made of material that dissolves easily in water, initiating a landslide in the process.
  - D. Change their internal structure under stress, allowing them to get "mushy" and thus be slippery.
22. Quick clays are characteristically found in
- A. Northern subtropical regions.
  - B. Northern temperate regions.
  - C. Northern equatorial regions.
  - D. Northern polar regions.
23. Rainfall intensity and duration affect the likelihood of the occurrence of mass movement. Which of the following is true?
- A. Rainfall intensity is more important than duration.
  - B. Rainfall duration is more important than intensity.
  - C. They are equally important and their effect is universal: a unique combination of rainfall duration and intensity will set off mass movement anywhere.
  - D. They are both important, but different geologic materials and geographic settings have different resistance to mass movement as started by rainfall.
24. A kind of mass movement in which materials move in a disorganized, chaotic fashion is a
- A. Slide.
  - B. Fall.
  - C. Slump.
  - D. Flow.
25. Where rotational movement of soil is accompanied by downslope movement the feature that is observed is a
- A. Scarp.
  - B. Talus.
  - C. Slump.
  - D. Solifluction.
26. Which of the following is not a type of flow?
- A. Slump
  - B. Nuée ardente
  - C. Debris avalanche
  - D. Snow avalanche

27. Which is/are true?
- A. Curved tree trunks and tilted utility poles may be signs of soil creep
  - B. In a true slide, movement of a coherent mass of material occurs along a well-defined plane
  - C. Surfaces of ancient landslides often have a lumpy (hummocky) appearance
  - D. All of the choices are true.
28. What is the most important process for the loosening and braking up of consolidated rock in high, mountainous regions?
- A. Increasing effective stress
  - B. Repetitive freezing of water and thawing of ice in cracks
  - C. Increasing the consolidation parameter
  - D. Erosion by rivers
29. In designing a retaining wall to support an unstable slope, the best design would be
- A. A high, thin, impermeable wall.
  - B. A high, thin wall with drainage holes.
  - C. A short, stout wall at the foot of the slope.
  - D. Any of these; all would be equally effective.
30. A thin, shallowly inclined rockslide might best be stabilized by
- A. The use of rock bolts.
  - B. The addition of fluid to make the rock swell and stick.
  - C. Driving long, thin piles into rocks below.
  - D. Heating and baking the rocks to solidify them.
31. If a slope in unconsolidated material is unstable due to high water content,
- A. It may be dewatered by installation of drainage pipes.
  - B. It may best be stabilized by covering the slope with impermeable material.
  - C. It may be stabilized by steepening the slope angle.
  - D. Nothing can be done to modify the hazard.
32. Which of the following is/are true?
- A. Clay minerals make for very stable slopes because they bake and harden in the sun.
  - B. An unstable slope can be stabilized by removing material to reduce the slope angle.
  - C. Natural slopes, once formed, remain stable unless disturbed by human activities.
  - D. All of the choices are correct.
33. A landslide warning system, developed in California, utilizes all of the following except
- A. The past history of sliding in an area.
  - B. Quantitative relationships between storm intensity and duration and resultant sliding.
  - C. Laboratory studies of response of slopes to earthquakes.
  - D. Characteristics of slopes, such as angles and soil types.
34. Factors contributing to the Vaiont Reservoir landslide included all of the following except
- A. Heavy rains.
  - B. Filling of the reservoir.
  - C. The presence of clay-rich layers in the valley wall rocks.
  - D. Earthquakes.
35. Which of the following is a common "trigger" of landslides?
- A. Earthquakes
  - B. Lava flows
  - C. Vegetation
  - D. All of the choices are correct.

36. Reduction of the slide potential of a very steep slope can be carried out by
- A. Placing more support on the foot of the slope.
  - B. Reducing the weight or load on the slope.
  - C. Reducing the angle of the slope.
  - D. All of the choices are correct.
37. Weathering process do exert some influence on mass wasting.  
True False
38. Localized areas of high landslide risk may occur within regions of overall low risk.  
True False
39. Mass wasting is possible anywhere in the world, either due to natural processes or human modification.  
True False
40. The removal of vegetation always makes soil-covered slopes more stable because it removes excess weight.  
True False
41. The light weight of snow, as compared with soil or rock, means that snow avalanches are never a threat to property.  
True False
42. Landslides may be triggered by earthquakes or by heavy rains.  
True False
43. Mass wasting threatens only property, not lives, because it occurs so slowly.  
True False
44. In a true slide, movement of a coherent mass of material occurs along a well-defined plane.  
True False
45. A secondary hazard of landslides is flooding that occurs when slides dam stream valleys.  
True False
46. Sites of past rock falls or slides are sometimes obvious because they remain unagitated.  
True False
47. Human activities do not play a role in mass wasting.  
True False
48. Once poor land-use practices causing landslides are halted, the slides will also stop moving.  
True False
49. A landslide warning system recently tested in California could identify the areas at risk, but could not predict the time of probable sliding.  
True False
50. In landslide-prone areas, whether a given rainstorm will cause sliding may depend, in part, on the amount of rainfall in the recent past, too.  
True False
51. Landslides never take lives because they move slowly.  
True False
52. In the Vaiont Reservoir disaster, flooding resulted when water rushed over the dam due to a large landslide.  
True False

53. Heavy rains and thick tropical soils caused landslides and debris flows along the Venezuelan coast.  
True False
54. Rock falls and rock slides occur in Yosemite National Park because slopes over steepened by past glaciations are readjusting to lower, safer slope angles.  
True False

## 8 Key

1. Mass wasting
  - A. Is a formal term for the weathering of rock masses.
  - B. Represents the process of lava flow.
  - C.** Is the movement of material (rock or soil) down slope due to gravity.
  - D. Is the movement of material by wind.

*Montgomery - Chapter 08 #1*

2. Mass movements owing to downslope pull is called
  - A. Shear strength.
  - B. Shear pull.
  - C. Shear power.
  - D.** Shear stress.

*Montgomery - Chapter 08 #2*

3. The steepest stable slope that an unconsolidated material can maintain is the material's
  - A. Shear strength.
  - B.** Angle of repose.
  - C. Cohesion.
  - D. Scarp.

*Montgomery - Chapter 08 #3*

4. An over steepened slope
  - A. Is one that has been carelessly modified by human activity.
  - B. Is an aspect of slope processes that results only from tectonic deformation.
  - C. Is a concept that pertains only to slopes in rock.
  - D.** Is one that has an angle greater than the angle of repose for the material comprising the slope.

*Montgomery - Chapter 08 #4*

5. Addition of water to soil on slopes may
  - A. Stabilize the soil by freezing and thawing.
  - B. Stabilize the soil by increasing pore pressure.
  - C.** Destabilize the slope by reducing frictional resistance to sliding.
  - D. Destabilize the slope by decreasing the slope angle.

*Montgomery - Chapter 08 #5*

6. Rock falls
  - A. Occur only on mountain sides in dry climates.
  - B.** Occur on any steep-faced cliff, including under waterfalls.
  - C. Cause the "nick point" in a stream to migrate downstream with time.
  - D. Are unaffected by waves slamming against the base of a sea cliff.

*Montgomery - Chapter 08 #6*

7. Slumps are characterized by
  - A. Complete mixing of earth materials as it moves down slope.
  - B. Liquefaction.
  - C.** Somewhat coherent pieces of earth that rotate on a curved surface.
  - D. Lateral spreading.

*Montgomery - Chapter 08 #7*

8. Quick clay is
  - A.** A marine deposited mixture of glacially derived clay and silt weakened by infiltrating fresh water upon uplift of these sediments above sea level.
  - B. Clay that expands when wet, contracts when dry.
  - C. Clay that forms very steep cliffs, which slide rapidly when they fall.
  - D. Clay that is too unstable for plants to grow on.

*Montgomery - Chapter 08 #8*

9. Unconsolidated material is likely to be involved in which kinds of mass movement?  
A. Block glides, rock falls and rock creep  
**B.** Creep, slumps and avalanches  
C. Talus piles  
D. Consolidation

*Montgomery - Chapter 08 #9*

10. The coarse material that gathers at the foot of the slope which results in rockfalls is called  
A. Debris.  
**B.** Talus.  
C. Detritus.  
D. Clastic.

*Montgomery - Chapter 08 #10*

11. Debris flows  
A. May move rapidly and transport rock materials of greatly different size.  
B. Are common in semi-arid regions.  
C. Are not fluids in their behavior, but are dry flows of material.  
**D.** Both may move rapidly and transport rock materials of greatly different size and are common in semi-arid regions are correct.

*Montgomery - Chapter 08 #11*

12. This type of mass wasting is a hazard within Yosemite National Park  
A. Slumps.  
**B.** Rock slides and rock falls.  
C. Debris flows.  
D. Rock creep.

*Montgomery - Chapter 08 #12*

13. Which of the following is the slowest form of mass movement?  
**A.** Soil creep  
B. Slumps  
C. Rock falls  
D. Rock slides

*Montgomery - Chapter 08 #13*

14. Which of the following is the fastest form of mass movement?  
A. Soil creep  
B. Debris flow  
C. Earth flow  
**D.** Rockfall

*Montgomery - Chapter 08 #14*

15. When wet soil moves slowly over an impermeable surface the phenomenon observed is called  
**A.** Solifluction.  
B. Permafrost.  
C. Rock slide.  
D. Rockfall.

*Montgomery - Chapter 08 #15*

16. All of the following could increase the risk of landslide on a slope except  
A. Use of septic tanks.  
B. Building a house on the slope.  
**C.** Planting shrubs with extensive root systems.  
D. Adding fill at the top of the slope to build a road.

*Montgomery - Chapter 08 #16*

17. The type of clay that can absorb water up to twenty times its weight and results in the formation of a weak gel is
- A. Kaolinite.
  - B. Calcite.
  - C.** Montmorillonite.
  - D. All the choices are correct.

*Montgomery - Chapter 08 #17*

18. Vegetation may
- A. Increase slope stability because roots help hold soil in place.
  - B. Decrease slope stability by adding weight.
  - C. Increase slope stability by taking up moisture.
  - D.** Any one of the scenarios.

*Montgomery - Chapter 08 #18*

19. Construction of a reservoir behind a dam
- A. Stabilizes the sides of the reservoir walls; the water buoys them up.
  - B.** Can destabilize the slopes by increasing pore fluid pressure.
  - C. Destabilizes the slopes because of the weight of the dam.
  - D. Has no effect on slope stability.

*Montgomery - Chapter 08 #19*

20. Soil creep
- A. Cannot be recognized or detected because it is such a slow process.
  - B.** Is more of a hazard to property than to lives.
  - C. Commonly triggers snow avalanches because it makes overlying snow unstable.
  - D. All of the choices are correct.

*Montgomery - Chapter 08 #20*

21. The reason clay minerals (and other phyllosilicate) often form the slip plane for a landslide is that they
- A.** Have platy structures, allowing them to stack up and then slip past each other, like a deck of cards and also have high porosity.
  - B. Have rigid structures that can trap oil and the oil acts as a lubricant for the landslide.
  - C. Are made of material that dissolves easily in water, initiating a landslide in the process.
  - D. Change their internal structure under stress, allowing them to get "mushy" and thus be slippery.

*Montgomery - Chapter 08 #21*

22. Quick clays are characteristically found in
- A. Northern subtropical regions.
  - B. Northern temperate regions.
  - C. Northern equatorial regions.
  - D.** Northern polar regions.

*Montgomery - Chapter 08 #22*

23. Rainfall intensity and duration affect the likelihood of the occurrence of mass movement. Which of the following is true?
- A. Rainfall intensity is more important than duration.
  - B. Rainfall duration is more important than intensity.
  - C. They are equally important and their effect is universal: a unique combination of rainfall duration and intensity will set off mass movement anywhere.
  - D.** They are both important, but different geologic materials and geographic settings have different resistance to mass movement as started by rainfall.

*Montgomery - Chapter 08 #23*

24. A kind of mass movement in which materials move in a disorganized, chaotic fashion is a
- A. Slide.
  - B. Fall.
  - C. Slump.
  - D.** Flow.

*Montgomery - Chapter 08 #24*

25. Where rotational movement of soil is accompanied by downslope movement the feature that is observed is a
- A. Scarp.
  - B. Talus.
  - C. Slump.**
  - D. Solifluction.

Montgomery - Chapter 08 #25

26. Which of the following is not a type of flow?
- A. Slump**
  - B. Nuée ardente
  - C. Debris avalanche
  - D. Snow avalanche

Montgomery - Chapter 08 #26

27. Which is/are true?
- A. Curved tree trunks and tilted utility poles may be signs of soil creep
  - B. In a true slide, movement of a coherent mass of material occurs along a well-defined plane
  - C. Surfaces of ancient landslides often have a lumpy (hummocky) appearance
  - D. All of the choices are true.**

Montgomery - Chapter 08 #27  
Scrambling: Locked.

28. What is the most important process for the loosening and braking up of consolidated rock in high, mountainous regions?
- A. Increasing effective stress
  - B. Repetitive freezing of water and thawing of ice in cracks**
  - C. Increasing the consolidation parameter
  - D. Erosion by rivers

Montgomery - Chapter 08 #28

29. In designing a retaining wall to support an unstable slope, the best design would be
- A. A high, thin, impermeable wall.
  - B. A high, thin wall with drainage holes.
  - C. A short, stout wall at the foot of the slope.**
  - D. Any of these; all would be equally effective.

Montgomery - Chapter 08 #29

30. A thin, shallowly inclined rockslide might best be stabilized by
- A. The use of rock bolts.**
  - B. The addition of fluid to make the rock swell and stick.
  - C. Driving long, thin piles into rocks below.
  - D. Heating and baking the rocks to solidify them.

Montgomery - Chapter 08 #30

31. If a slope in unconsolidated material is unstable due to high water content,
- A. It may be dewatered by installation of drainage pipes.**
  - B. It may best be stabilized by covering the slope with impermeable material.
  - C. It may be stabilized by steepening the slope angle.
  - D. Nothing can be done to modify the hazard.

Montgomery - Chapter 08 #31

32. Which of the following is/are true?
- A. Clay minerals make for very stable slopes because they bake and harden in the sun.
  - B. An unstable slope can be stabilized by removing material to reduce the slope angle.**
  - C. Natural slopes, once formed, remain stable unless disturbed by human activities.
  - D. All of the choices are correct.

Montgomery - Chapter 08 #32

33. A landslide warning system, developed in California, utilizes all of the following except
- A. The past history of sliding in an area.
  - B. Quantitative relationships between storm intensity and duration and resultant sliding.
  - C.** Laboratory studies of response of slopes to earthquakes.
  - D. Characteristics of slopes, such as angles and soil types.

*Montgomery - Chapter 08 #33*

34. Factors contributing to the Vaiont Reservoir landslide included all of the following except
- A. Heavy rains.
  - B. Filling of the reservoir.
  - C. The presence of clay-rich layers in the valley wall rocks.
  - D.** Earthquakes.

*Montgomery - Chapter 08 #34*

35. Which of the following is a common "trigger" of landslides?
- A.** Earthquakes
  - B. Lava flows
  - C. Vegetation
  - D. All of the choices are correct.

*Montgomery - Chapter 08 #35*

36. Reduction of the slide potential of a very steep slope can be carried out by
- A. Placing more support on the foot of the slope.
  - B. Reducing the weight or load on the slope.
  - C. Reducing the angle of the slope.
  - D.** All of the choices are correct.

*Montgomery - Chapter 08 #36*

37. Weathering process do exert some influence on mass wasting.
- TRUE**

*Montgomery - Chapter 08 #37*

38. Localized areas of high landslide risk may occur within regions of overall low risk.
- TRUE**

*Montgomery - Chapter 08 #38*

39. Mass wasting is possible anywhere in the world, either due to natural processes or human modification.
- TRUE**

*Montgomery - Chapter 08 #39*

40. The removal of vegetation always makes soil-covered slopes more stable because it removes excess weight.
- FALSE**

*Montgomery - Chapter 08 #40*

41. The light weight of snow, as compared with soil or rock, means that snow avalanches are never a threat to property.
- FALSE**

*Montgomery - Chapter 08 #41*

42. Landslides may be triggered by earthquakes or by heavy rains.
- TRUE**

*Montgomery - Chapter 08 #42*

43. Mass wasting threatens only property, not lives, because it occurs so slowly.
- FALSE**

*Montgomery - Chapter 08 #43*

44. In a true slide, movement of a coherent mass of material occurs along a well-defined plane.
- TRUE**

*Montgomery - Chapter 08 #44*

45. A secondary hazard of landslides is flooding that occurs when slides dam stream valleys.  
**TRUE**
- Montgomery - Chapter 08 #45*
46. Sites of past rock falls or slides are sometimes obvious because they remain unagitated.  
**TRUE**
- Montgomery - Chapter 08 #46*
47. Human activities do not play a role in mass wasting.  
**FALSE**
- Montgomery - Chapter 08 #47*
48. Once poor land-use practices causing landslides are halted, the slides will also stop moving.  
**TRUE**
- Montgomery - Chapter 08 #48*
49. A landslide warning system recently tested in California could identify the areas at risk, but could not predict the time of probable sliding.  
**TRUE**
- Montgomery - Chapter 08 #49*
50. In landslide-prone areas, whether a given rainstorm will cause sliding may depend, in part, on the amount of rainfall in the recent past, too.  
**TRUE**
- Montgomery - Chapter 08 #50*
51. Landslides never take lives because they move slowly.  
**FALSE**
- Montgomery - Chapter 08 #51*
52. In the Vaiont Reservoir disaster, flooding resulted when water rushed over the dam due to a large landslide.  
**TRUE**
- Montgomery - Chapter 08 #52*
53. Heavy rains and thick tropical soils caused landslides and debris flows along the Venezuelan coast.  
**TRUE**
- Montgomery - Chapter 08 #53*
54. Rock falls and rock slides occur in Yosemite National Park because slopes over steepened by past glaciations are readjusting to lower, safer slope angles.  
**TRUE**
- Montgomery - Chapter 08 #54*

## 8 Summary

<u>Category</u>	<u># of Questions</u>
Montgomery - Chapter 08	54
Scrambling: Locked.	1