

EOSC 114 MIDTERM 3 EXAMPLE BASED ON 2016 EXAMS

REMINDER OF EXAM POLICY:

1. Each student must be prepared to produce, upon request, a UBC card for identification.
2. Students suspected of any of the following, or similar, dishonest practices shall be immediately dismissed from the examination and shall be liable to disciplinary action:
 - having at the place of writing any books, papers or memoranda, calculators, computers, sound or image players/recorders/transmitters (including telephones), or other memory aid devices, other than those authorized by the examiners;
 - speaking or communicating with other candidates;
 - purposely exposing written papers to the view of other candidates or imaging devices. The plea of accident or forgetfulness shall not be received.
3. Students must hand in all midterm materials.

For more details and UBC Policy on Student Conduct During Exams – use this link

<http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,41,90,0>

PLEASE NOTE – Answer keys are not provided, because that makes you less likely to learn from them. The reason is that students who memorize answers to past exams usually earn lower grades than those who study the subject material. We want you to learn the material.

1. A property developer is planning to build a new town in an area that is prone to landslides. Which of the following is the best way to keep the town safe from landslides?
 - A) Having inexpensive infrastructure
 - B) Teaching the population about the warning signs of landslides
 - C) Placing the town in a different location
 - D) Installing debris retention structures
 - E) Installing netting

2. Which of the following causes is the most important reason we have more landslides in British Columbia than in other provinces in Canada?
 - A) Slope angle
 - B) Rainfall (water)
 - C) Freeze thaw (water)
 - D) Climate
 - E) Adverse geologic structures

3. Which of the following is the best definition for angle of repose?
 - A) The steepest angle a slope can maintain without collapsing
 - B) The angle depends on the material that makes up the slope
 - C) The angle where the shear stress on the slope is exactly balanced by shear strength
 - D) The angle of sand falling down a slope
 - E) The angle where the clicker starts to slide off your desk

4. Which statement about landslides is **TRUE**?
 - A) Triggers lead to instability
 - B) Causes start landslides
 - C) Causes are short lived events
 - D) Triggers initiate motion
 - E) There can be many triggers for one event

5. In which of the following locations would you be most concerned about frost wedging/freeze thaw increasing rockfall?
 - A) The Tropics
 - B) California
 - C) Vancouver
 - D) Whistler
 - E) The South Pole

6. Which of the following was not a possible cause of the Oso Landslide in Washington State?
 - A) Quick Clay
 - B) Adverse Geologic Structures
 - C) Undercutting
 - D) Overloading
 - E) Water

7. Forestry roads in British Columbia are sometimes poorly made and lead to landslides. Why?
 - A) They are often undercut by rivers.
 - B) They often undercut slopes
 - C) They often overload slopes
 - D) High average rainfall in BC
 - E) Both B) and C)

8. The human response to 'creep' is likely to be _____.
 - A) rapid death
 - B) fear and panic
 - C) evacuation
 - D) maintenance
 - E) paranoia

9. What failure mode (motion) would you expect if a substantial landslide occurred in the location depicted below?

- A) Fall
- B) Rotational slide
- C) Translational slide
- D) Flow
- E) Complex movement



10. Which of the following landslide causes **CANNOT** also be a trigger?

- A) Steep slope angle
- B) Overloading
- C) Undercutting
- D) Water - in the form of a heavy rainfall
- E) Jumping up and down

11. Which of the following does **NOT** indicate that a slope could be unstable?

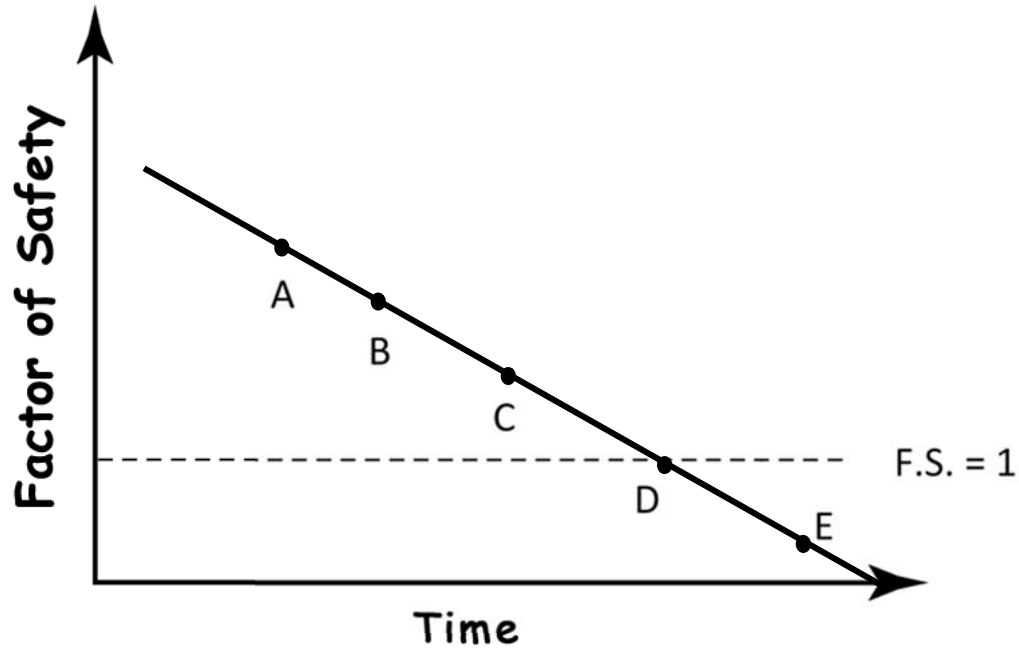
- A) Pistol Butt trees in the back yard
- B) Cracks in the pavement
- C) Leaking swimming pools
- D) Evidence of previous landslides
- E) A heavy rain storm

12. A highway is threatened by very large blocks of rock (40 metres by 10 metres by 2 metres) that could slide onto the road. Which of the following methods would be the best choice for mitigation, both effective and not too expensive?

- A) Debris retention structure
- B) Rock bolts or anchors
- C) Retaining walls
- D) Rock catchment fence
- E) Netting

13. What is the classification (name) of the landslide circled in the image below?

- A) Debris flow B) Debris slide C) Debris fall
D) Rotational slide E) Creep



14. The graph above represents the gradual weakening of a slope over time. At which of the following points on the line is the slope most likely to fail?

- A) A B) B C) C D) D E) E

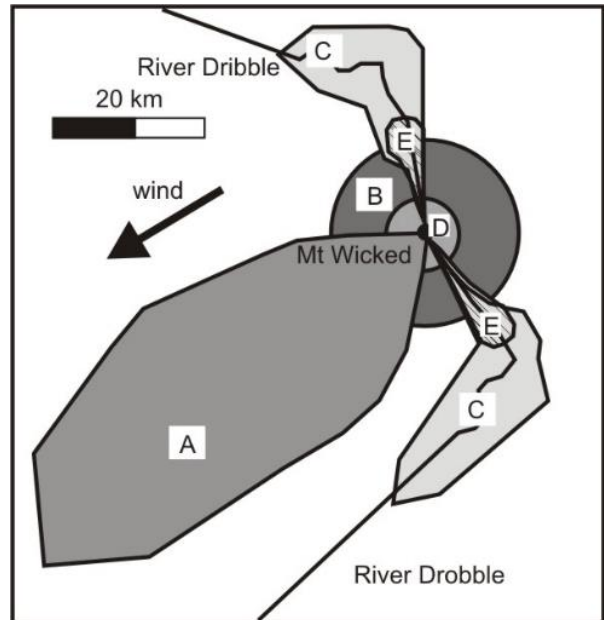
15. The relatively high shear strength of quick clays can be reduced to almost zero by _____.
 A) a short but heavy rainfall event
 B) silt particles that are attracted to salt
 C) many hundreds of years of infiltrating groundwater
 D) adding salt to the particles causing them to flocculate together
 E) lowering the water content of the clay
16. What type of explosive eruption was the 79 AD eruption of Mt. Vesuvius, Italy, which buried Pompeii and Herculaneum?
 A) Strombolian B) Plinian C) Phreatomagmatic
 D) Vulcanian E) Stratovolcanic
17. Which of the following volcanic hazards can occur **WITHOUT** an accompanying eruption?
 A) lava flow B) volcanic ash cloud C) pyroclastic flow
 D) lahar E) volcanic bombs
18. The shape of a shield volcano is the result of many eruptions of _____ viscosity _____. A)
 high; mafic lavas
 B) high; felsic lavas
 C) low; mafic lavas
 D) low; felsic lavas
 E) high; felsic pyroclasts
19. The 1980 eruption of Mt St Helens was a VEI of 5, erupting $\sim 1 \text{ km}^3$ of tephra. The Mt Pinatubo eruption of 1991 was a VEI of 6, approximately how much tephra was erupted during the Mt Pinatubo eruption?
 A) $<1 \text{ km}^3$ B) $\sim 1 \text{ km}^3$ C) $\sim 10 \text{ km}^3$ D) $\sim 100 \text{ km}^3$
 E) None, Mt Pinatubo erupted only lavas
20. Which of the following does **NOT** depend on the chemical composition of an extrusive igneous rock/lava?
 A) Crystal size B) Melting temperature C) Mineralogy
 D) Viscosity E) Solidification temperature
21. Which of the following monitoring methods is used to detect the volume and type of gas being emitted by a volcano?
 A) A GPS network B) Tiltmeters C) InSAR
 D) FTIR E) Seismic monitoring
22. If you were put in charge of starting a monitoring program for a newly discovered dormant stratovolcano showing renewed signs of activity, what should be your order of priorities?
 A) Seismometers, global positioning systems, mapping of previous hazards, tiltmeters
 B) Global positioning systems, seismometers, mapping of previous hazards, tiltmeters
 C) Seismometers, global positioning systems, tiltmeters, mapping of previous hazards
 D) Seismometers, tiltmeters, global positioning systems, mapping of previous hazards
 E) Mapping of previous hazards, seismometers, global positioning systems, tiltmeters

23. Explosive eruptions disperse tephra as _____.

- A) lava flows and domes
- B) lava flows and pyroclastic flows
- C) fall out and domes
- D) fall out and lava flows
- E) fall out and ballistics

24. On the diagram to the right which area on the hazard map represents the region of likely air fall hazard?

- A) A
- B) B
- C) C
- D) D
- E) E



25. Also considering the diagram in Question 24, this is a hazard map for a stratovolcano or composite cone, which two of the hazards shown would also be most likely to be found on a cinder cone hazard map?

- A) A & B
- B) B & C
- C) C & D
- D) D & E
- E) None of them will be found on a cinder cone hazard map

26. The most likely place to find an active volcano is _____.

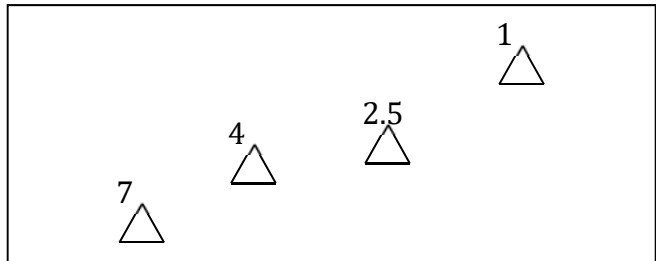
- A) in a mountain range above a subduction zone
- B) along a transform plate boundary
- C) in a mountain range formed by two continents colliding
- D) in the center of a continent
- E) in an oceanic trench

27. Mt Baker is an example of a _____.

- A) cinder cone
- B) stratovolcano
- C) shield volcano
- D) supervolcano
- E) megavolcano

28. How does viscosity affect explosivity?
- A) High viscosity magmas are colder.
 - B) Low viscosity magma traps gas, increasing the pressure.
 - C) Low viscosity magma lets gas escape, increasing the pressure.
 - D) High viscosity magma lets gas escape, increasing the pressure.
 - E) High viscosity magma traps gas, increasing the pressure.

29. This diagram represents volcanoes formed by a mantle plume under an oceanic plate. Numbers represent ages of volcanoes in Millions of years. Toward which direction is the oceanic plate moving?



- A) Northeast
 - B) Northwest
 - C) Southeast
 - D) Southwest
 - E) The plate is not moving
30. A very silica rich igneous rock with large interlocking crystals is called a(n) _____.
A) basalt B) rhyolite C) andesite
D) granite E) gabbro

---THE END--