

EXAM QUESTIONS: GEOMORPHOLOGY
13 NOVEMBER 2014

Lesson Description

In this lesson we:

- Work through exam questions from the Grade 11 syllabus relating to Geomorphology.


Exam Questions
Question 1

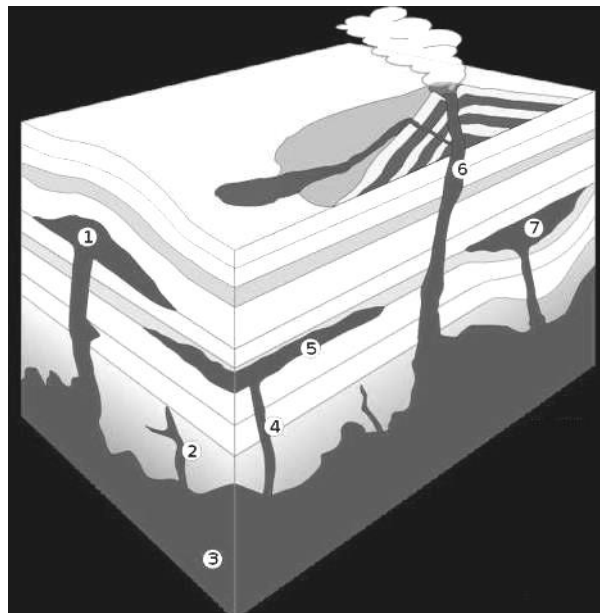
Complete each of the following statements by choosing a word/term from the list below.

Erosion; Igneous; Inclined strata; Mesa; Tor

- 1.1. A granite dome consisting of core stones and secondary stones is known as a... (1 x 2) (2)
- 1.2. Basalt is an example of an ... rock. (1 x 2) (2)
- 1.3. A ... is formed in a structural landscape and is eroded further to form a butte. (1 x 2) (2)
- 1.4. A cuesta is an example of a landform formed by ... (1 x 2) (2)
- 1.5. ... is the term describing the removal and transportation of material. (1 x 2) (2)

Question 2

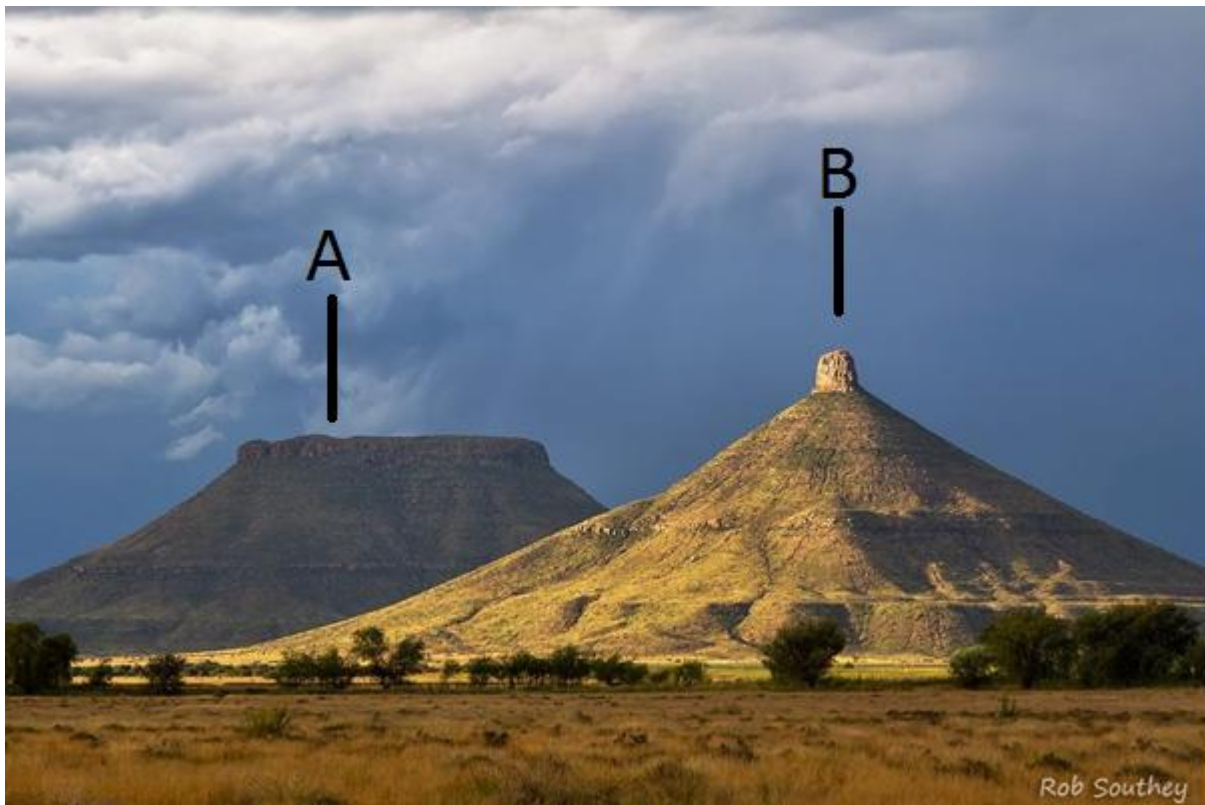
Refer to FIGURE 2 showing igneous intrusions and answer the questions that follow.



- 2.1 Name the largest igneous intrusion labelled 3. (1 x 2) (2)
- 2.2 Label igneous intrusions 1, 2 and 7. (3 x 2) (6)
- 2.3 Which landform would develop if 1 is exposed to the Earth's surface? (1 x 2) (2)

Question 3

Refer to FIGURE 3 showing a structural landscape.



- 3.1 **Identify** the landforms marked A and B. (2 x 2)(4)
- 3.2 This landscape comprises *inclined strata / horizontal strata / massive rock*. (1 x 2)(2)
- 3.3 **Describe** how landform A will be eroded to eventually become landform B. (3 x 2)(6)
- 3.4 **Draw** a cross-sectional sketch of the landform labelled **A** in Figure 4. (2 x 2)(4)
- 3.5 On your sketch, clearly show the following:
- (a) the caprock (1 x 2)(2)
 - (b) the FOUR slope elements (4 x 2)(8)
- 3.6 **Name** ONE form of mass wasting that occurs on EACH slope element. (4 x 2)(8)

Question 4

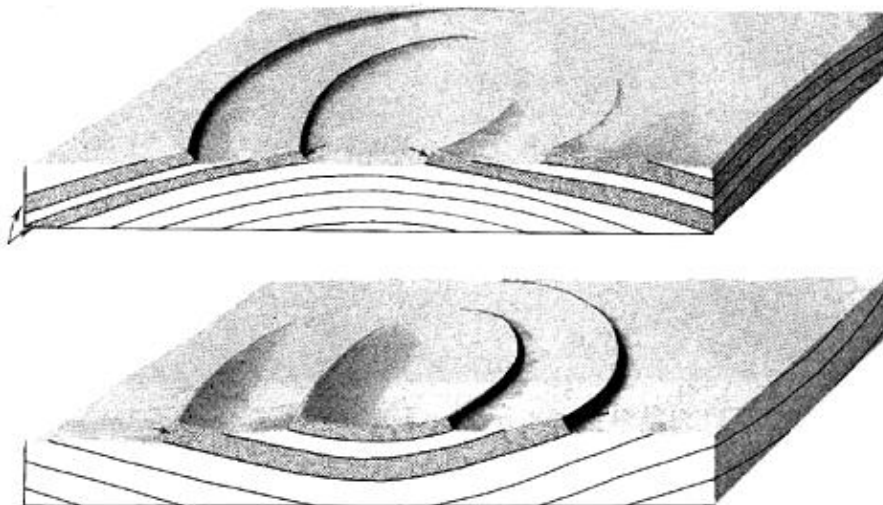
Select the correct answer from the options below.

- 4.1 What type of a slope is the scarp slope of a cuesta? (1 x 2)(2)
- A dip
 - B ridge
 - C steep
 - D concave
 - E gentle

- 4.2 Tors are associated with: (1 x 2)(2)
- A igneous rocks
 - B inclined strata
 - C sedimentary rocks
 - D horizontal rocks
 - E fold mountains
- 4.3 A homoclinal ridge that is angled beyond 30° is known as a: (1 x 2)(2)
- A cuesta
 - B hogback
 - C butte
 - D plateau
 - E dome
- 4.4 The process of a mesa becoming a butte is as a result of: (1 x 2)(2)
- A downcutting
 - B soil creep
 - C scarp recession
 - D carbonation
 - E exfoliation
- 4.5 The dominant form of mass wasting found on the crest is: (1 x 2)(2)
- A rockfall
 - B solifluction
 - C slumping
 - D shattering
 - E soil creep

Question 5

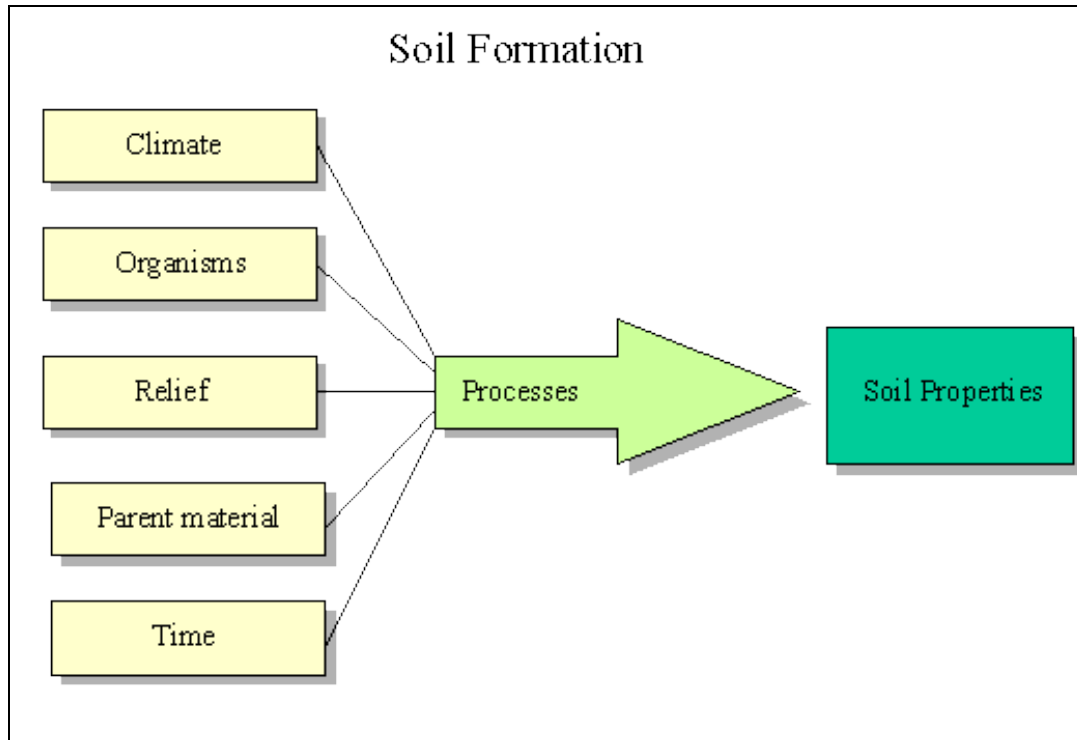
Refer to FIGURE 5 showing cuestas and answer the questions that follow.



- 5.1 What is a cuesta? (1 x 2) (2)
- 5.2 Describe the difference in the formation of cuestas in diagrams A and B. (2 x 2) (4)
- 5.3 Describe the difference between the dip slope and the scarp slope of a cuesta. (2 x 2) (4)
- 5.4 Discuss how humans can use cuestas. (2 x 2) (4)

Question 6 - Soil

Refer to Figure 6 which shows elements of soil formation.



<http://www.soils.wisc.edu/courses/SS325/formation.htm>

- 6.1 With reference to Figure 6 above, **tabulate** the differences between active and passive factors in the formation of any soil giving examples of each. Copy the table outline onto your answer sheet. (4 x 2)(8)

PASSIVE FACTORS	ACTIVE FACTORS
Definition	Definition
Examples	Examples

- 6.2 **Describe** TWO ways in which human activities promote soil erosion. (2 x 2)(4)
- 6.3 **Suggest** TWO ways to combat soil erosion. (2 x 2)(4)



Answers

Exam Questions

Question 1

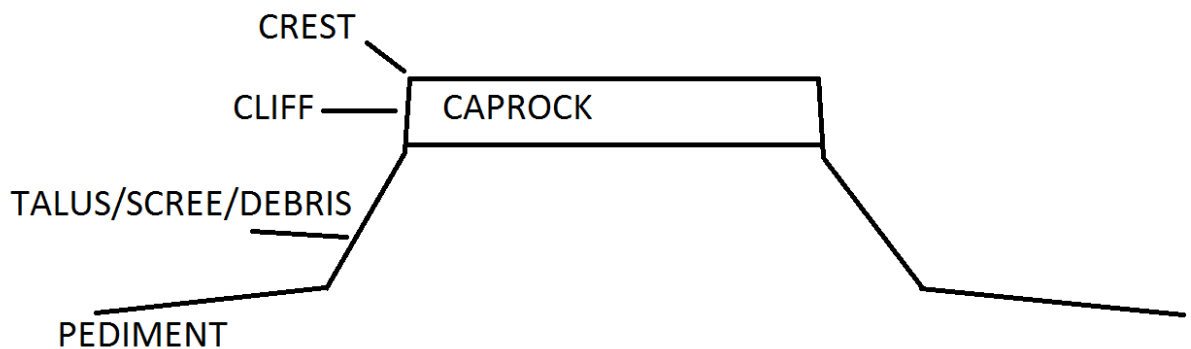
- 1.1 Tor (1 x 2)(2)
- 1.2 Igneous (1 x 2)(2)
- 1.3 Mesa (1 x 2)(2)
- 1.4 Inclined strata (1 x 2)(2)
- 1.5 Erosion (1 x 2)(2)

Question 2

- 2.1 Batholith (1 x 2)(2)
- 2.2 1 – laccolith (1 x 2)(2)
2 – dyke (1 x 2)(2)
7 – lopolith (1 x 2)(2)
- 2.3 Granite dome / tor/ bornhardt (1 x 2)(2)

Question 3

- 3.1 A – mesa B – Butte (2 x 2)(4)
- 3.2 horizontal strata (1 x 2)(2)
- 3.3 Vertical cliffs will be eroded with material dropping to the slopes below. Cliffs retreat parallel to one another in a process called scarp recession. Eventually the width of the landform is smaller than its height, thus forming a butte. (3 x 2)(6)
- 3.4 (1 x 2) and 3.5



- (a)(1 x 2)(2)
- (b)(4 x 2)(8)
- 3.6 Crest – soils creep
Cliff – rock fall
Talus – slide
Pediment – flow (4 x 2)(8)

Question 4

- 4.1 C – steep (1 x 2)(2)
- 4.2 A – igneous (1 x 2)(2)
- 4.3 B – hogsback (1 x 2)(2)
- 4.4 C – scarp recession (1 x 2)(2)
- 4.5 E – soil creep (1 x 2)(2)

Question 5

- 5.1 A ridge that develop in tilted sedimentary rock characterised by a gentle slope and a steep slope (2)
 [Concept] 1x2 (2)
- 5.2 A forms when the rock strata in the centre are pushed upward (2)
 B forms when the rock strata in the centre are pushed downward (2)
 [Concept] 2x2 (4)
- 5.3 Dip slope is gentle (2)
 Scarp slope is steep (2) 2x2 (4)
- 5.4 Farming takes place in the cuesta valleys situated between the ridges, as the flat surface is covered in fertile soil (2)
 Where cuesta basins form, artesian wells, which are sources of groundwater, are found (2)
 These basins can also form oil traps (2)
 These ridges are of strategic importance, as they can protect settlements on the cuesta valley floors during times of war (2)
 The ridges form excellent lookout points (2)
 Many outdoor activities are concentrated in these landscaping e.g. hang gliding and hot air ballooning (2)
 [Any TWO] 2x2 (4)

Question 6

6.1

PASSIVE FACTORS	ACTIVE FACTORS
Definition – factors associated with the materials that forms the soils; no action / movement involved	Definition – factors that involve action / movement to form the soil
Examples – Time, climate, parent material	Examples – Relief, organisms,

(2 x 2)(4)

- 6.2 Overcultivation – removes natural vegetation, ploughing breaks up the soil exposing it to agents of erosion.
 Overgrazing – removes natural vegetation which holds soil together. Animals wear paths into soil. (2 x 2)(4)
- 6.3 Contour ploughing – creates terraces which slows surface run off and prevents vertical channels from forming which would accelerate erosion.
 Controlling carrying capacity – limiting numbers of animals helps to retain the vegetation cover which holds the soil together. (2 x 2)(4)