Geomorphic Processes

Standard difficulty · 20 questions · 40 marks · Time: 37 minutes

Name: _____ Date: _____ Score: ____ / 40

Write full answers in Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. The external forces acting on the earth's surface are called:
   (a) tectonic forces **(b)** diastrophic forces
   (c) endogenic forces **(d)** exogenic forces

2. Which of these is an endogenic process?
   (a) epeirogeny **(b)** transportation by wind
   (c) abrasion by glaciers **(d)** deposition

3. What is meant by "orogeny"?
   (a) deposition of soil components lower down **(b)** wearing down of relief through erosion
   (c) mountain building through severe folding **(d)** filling up of basins and depressions

4. What is a slump?
   (a) debris slipping with a backward rotation
   (b) rock masses sliding down bedding, joint or fault surfaces
   (c) nearly free fall of debris from a vertical face
   (d) free falling of rock blocks from a steep slope

5. Which of these is a chemical weathering process?
   (a) pressure release **(b)** thermal expansion of rock
   (c) wedging by plant roots **(d)** hydration

6. What mainly controls the work of wind?
   (a) climate; it works as a gas **(b)** the kind of rock it flows through
   (c) climate; they work as a solid **(d)** their location along the coast

7. A slope rises 59 m over a horizontal distance of 100 m. What is its gradient as a percentage?
   (a) 59 % **(b)** 41 % **(c)** 64 % **(d)** 118 %

8. Suppose a bare hillside loses 7 mm of topsoil a year. How many years would it take to lose 28 cm? (1 cm = 10 mm)
   (a) 40 years **(b)** 4 years **(c)** 50 years **(d)** 80 years

Section B — Short answer — 8 × 2 = 16 marks

9. Distinguish between endogenic and exogenic forces.

10. Is each process endogenic or exogenic? (a) epeirogeny (b) weathering

11. What is meant by each? (a) eluviation (b) illuviation

12. Describe each kind of mass movement: (a) rockslide (b) rock fall

13. Is each soil-forming factor active or passive? (a) biological activity (b) time

14. What controls the work of each agent? (a) waves (b) groundwater

15. Suppose 1 cm of soil takes 900 years to form. How many years would 18 cm take, and why must topsoil be protected?

16. Slope A rises 8 m over 100 m and slope B rises 40 m over 200 m. What is the gradient of each as a percentage, and on which are mass movements more likely?

Section C — Longer answers — 4 × 4 = 16 marks

17. Explain why the surface of the earth is uneven.

18. Match each with its description: (a) debris slide (b) slump (c) debris fall. Choose from: nearly free fall of debris from a vertical face; rapid sliding of debris without backward rotation; debris slipping with a backward rotation.

19. A road is cut across a slope that rises 175 m over 500 m in a high-rainfall hill area. (a) What is the gradient as a percentage? (b) Give two activating causes of mass movements found here. (c) Suggest two ways to reduce the risk.

20. Explain where and why each forms: (a) desilication (b) peat

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Answer key

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Q	Answer	Working
1	**(d) exogenic forces**	—
2	**(a) epeirogeny**	—
3	**(c) mountain building through severe folding**	—
4	**(a) debris slipping with a backward rotation**	—
5	**(d) hydration**	—
6	**(a) climate; it works as a gas**	—
7	**(a) 59 %**	59 ÷ 100 × 100
8	**(a) 40 years**	28 × 10 ÷ 7
9	**Endogenic forces come from within the earth and build up land; exogenic forces come from the atmosphere and wear land down.**	—
10	**(a) endogenic (b) exogenic**	—
11	**(a) downward removal of soil components by water (b) deposition of soil components lower down**	—
12	**(a) rock masses sliding down bedding, joint or fault surfaces (b) free falling of rock blocks from a steep slope**	—
13	**(a) active (b) passive**	—
14	**(a) their location along the coast (b) the kind of rock it flows through**	—
15	**16,200 years; it forms very slowly but can be lost quickly to erosion.**	900 × 18
16	**An 8%, B 20%; slope B, being steeper**	8 ÷ 100 × 100; 40 ÷ 200 × 100
17	**Endogenic forces keep building up parts of the crust while exogenic forces wear them down; relief remains because these opposing actions continue at different rates.**	—
18	**(a) rapid sliding of debris without backward rotation (b) debris slipping with a backward rotation (c) nearly free fall of debris from a vertical face**	—
19	**(a) 35% (b) removal of support from below by cutting, saturation by heavy rain (also removal of vegetation) (c)**	175 ÷ 500 × 100

Q	Answer	Working
	planting trees, building retaining walls and drains, limiting construction on steep slopes.	
20	**(a) wet equatorial areas, where heavy rain removes silica (b) subarctic and tundra climates, where bacteria are slow**	—