Weathering – Practice Questions and Answers
Revised August 2007

1. The process by which Earth material is broken down in situ into smaller pieces is called _________ _________.

2. The chemical alteration of Earth materials brought on by reactions with some fluid or gas phase while at the Earth's surface is called _________ _________.

3. A joint is a surface across which Earth material has lost cohesion, and across which ___________ displacement has occurred.

4. A set of joints that parallel the land surface are probably ___________ or ___________ joints.

5. Joints that form parallel to some applied tectonic pressure are likely to be ___________ joints.

6. The weathering process by which blocks bounded by joint surfaces are reduced to spheroidal shapes is called _________ _________.

7. When water freezes its volume increases by as much as ___________.

8. ___________ ___________ is produced by the expansion of water upon freezing.

9. Root growth enlarges joint openings and is therefore a process associated with ___________ _________.

10. During transportation by wind, water, or ice, particles bounce and are scraped against other. This process is referred to as _________.

11. When blocks of solid material are broken down into smaller and smaller pieces the overall ___________ ________ is increased.

12. When surface area increases chemical reactivity likely ___________.

13. Carbonic acid forms when CO₂ (carbon dioxide) is mixed with _________ _________.

14. Brick red colors in weathered rock likely indicate the presence of _________________.

15. If calcite is introduced to significant quantities of rain water mixed with CO₂ (carbon dioxide), then it will _________________.

16. Earth materials weather at different rates. The previous statement refers to the process of _________________.
17. In the following photograph what are the surfaces called that bound the tabular sheets of granite paralleling the land surface (i.e., the surfaces that the white arrows point to)?

Yosemite National Park

18. In the following photograph there are two different sets of joints. The black arrows point to examples of one set while the red arrows point to the other. What are the surfaces called that the black arrows point to? What are the surfaces called that the red arrows point to?

Photo from USGS - ID. Calkins, F.C. 333 cfc00333
Yosemite National Park
19. In the following photograph, what is the name of the process that produced the large spherical shaped feature that the arrow points to?

![Yosemite National Park](image)

20. If the following reaction goes from left to right, then what weathering process is occurring?

\[ \text{CaCO}_3 + \text{H}_2\text{CO}_3 = \text{Ca}^{++} + 2\text{HCO}_3^- \]

21. What is the name of the ionic molecule represented by \(\text{HCO}_3^-\)?

22. What is \(\text{H}_2\text{CO}_3\)?

23. What mineral is represented by \(\text{CaCO}_3\)?

24. What weathering process is represented by the following chemical reaction?

\[ 4\text{Fe}^{++} + 3\text{O}_2 = 2\text{Fe}_2\text{O}_3 \]

25. What mineral has the formula \(\text{Fe}_2\text{O}_3\)?

26. What is the oxidation state of iron in \(\text{Fe}_2\text{O}_3\)?

27. Hematite is a ____________________________ belonging to which of the following groups?

(A) Carbonates  
(B) Halides  
(C) Phosphates  
(D) Oxides  
(E) Sulfates
28. Calcite is a _________________ belonging to which of the following groups?

(A) Carbonates  
(B) Halides  
(C) Phosphates  
(D) Oxides  
(E) Sulfides
29. **Answers**
1. physical weathering
2. chemical weathering
3. imperceptible
4. expansion, sheeting
5. extension
6. spheroidal weathering
7. 9 percent
8. frost wedging
9. physical weathering
10. abrasion
11. surface area
12. increases
13. rain water
14. hematite
15. dissolve
16. differential weathering
17. exfoliation sheets or pressure-release joints
18. black arrows point to extension joints, red arrows point to exfoliation (pressure-release) joints
19. spheroidal weathering
20. calcite dissolves so the processes is dissolution
21. bicarbonate
22. carbonic acid
23. calcite
24. oxidation
25. hematite
26. +3
27. non-silicate, (D) oxides
28. non-silicate, (A) carbonates